pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF ENVIRONMENTAL CLEANUP AND BROWNFIELDS
LAND RECYCLING PROGRAM

Land Recycling Program
Transmittal Sheet for Plan/Report Submission

Instructions: Please provide all requested information in each of the four sections. This transmittal sheet shall accompany any plan/report submitted to the Department under the Land Recycling Program. Proper completion of the Transmittal Sheet will assist Department review and may avoid a finding of plan/report deficiency. The Facility ID number can be obtained from the Department's Environmental Cleanup Program in the region where the site is located.

Section 1 - Site Identification

eFACTS Facility ID 51-33620

Site Name Former Philadelphia Energy Solutions Refinery – UDEX Release

Site Address 3144 West Passyunk Avenue

Municipality and County Philadelphia, Philadelphia County

Section 2 - Remediation Standard . . Plan/Report . . Fees

Identify the remediation standard being pursued and the type of plan/report being submitted. Please note required Department fees follow each type of plan/report.

Check the relevant standard and the type of plan/report being submitted.

☐ Background Standard
Final Report ($250 fee)

☒ Site-Specific Standard

- ☒ Remedial Investigation Report ($250 fee)
- ☐ Risk Assessment Report ($250 fee)
- ☐ Cleanup Plan ($250 fee)
- ☐ Final Report ($500 fee)*

☐ Statewide Health Standard*
Final Report ($250 fee)

☐ Special Industrial Area

- ☐ Work Plan (no fee)
- ☐ Baseline Environmental Report (no fee)

*A final report submitted under a combination of cleanup standards should be accompanied with a fee representing the higher of the two standards' final report fee.

Ensure your check covers all required fees and is made payable to the **Commonwealth of Pennsylvania**.

Section 3 - Municipal/Public Notice Confirmation

There are two stages in the Land Recycling Program where municipal and public notices are required. Read the information associated with each stage. You will be asked to confirm that information establishing your compliance with these notification requirements has been included with this submission.

☐ Check here if you are planning to meet the Background or Statewide Health Standard and your Final Report has been submitted within 90 days of the release.

Indicate date of release here _____

No further completion of this section is required if your Final Report for these two standards conforms to the 90 day time frame.

Stage 1 - Notice of Intent to Remediate (NIR)

☒ Check here to confirm you have included proof that a copy of your NIR was provided to each municipality where your site is located. Proof will be a copy of your cover letter and a copy of a signed certified mail receipt slip from the municipality.

☒ Check here to confirm a copy of a proof of publication document from a newspaper serving the area of your site has been included with this submission.

☐ Check here to indicate that a Site-Specific Standard or a Special Industrial Area is involved and a municipal request was received for development of a public involvement plan. The plan/report submission shall include municipality and public comments, which were submitted, and your responses to those comments.

Stage 2 - Cleanup Plan/Report Submission

10/1/2025 Place date here that each municipality was notified of any plan or report submitted under any of the three remediation standards.

The Philadelphia Inquirer Philadelphia Daily News Edition 10/2/2025 Place the newspaper name and date that your notice of your plan/report submission was published.

Section 4 - Project Contact

On the lines below, place the name, company, mailing addresses and business phone number of the individuals who can be contacted regarding this submission:

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(e.g. owner, participant in cleanup, responsible party, etc.)

Phone Number _____

Email Address _____

Company Name: _____

Mailing Address (street, city, state, zip)

_____

Remedial Investigation Report

UDEX Feed Underground Line Release

Former Philadelphia Energy Solutions Refinery
3144 West Passyunk Avenue
Philadelphia, Pennsylvania
PADEP Facility ID No. 856431

Stantec

Prepared for:
Bellwether District Holdings LLC
c/o Hilco Redevelopment Partners

Prepared by:
Stantec Consulting Services Inc.

October 2, 2025

Project/File:
195603450

Stantec Consulting Services Inc.

The conclusions in this Report titled UDEX Feed Underground Line Release Remedial Investigation Report are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

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1 Introduction

On behalf of Bellwether District Holdings, LLC (BDH), formerly known as Philadelphia Energy Solutions Refining and Marketing LLC (PESRM), Stantec Consulting Services Inc. (Stantec) has prepared this Remedial Investigation Report (RIR) to document the relevant historical context and investigations completed to characterize an underground petroleum release that occurred from an UDEX feed line (UDEX release) at a portion of the former Philadelphia Energy Solutions (PES) Refinery (facility). The facility is located at 3144 West Passyunk Avenue, Philadelphia, Pennsylvania.

Remediation activities are being conducted at the facility under the Pennsylvania Land Recycling and Environmental Remediation Standards Act (Act 2) by both BDH and Evergreen Resources Group, LLC (Evergreen)[1] in accordance with the Consent Order and Agreement (CO&A) among Pennsylvania Department of Environmental Protection (PADEP), Sunoco, Inc. (R&M) n/k/a Sunoco (R&M), LLC, and PESRM, now BDH, dated August 14, 2012 and the 2020 First Amendment to that Agreement (2020 Amendment). In accordance with the CO&A, Sunoco/Evergreen is responsible for addressing contamination at the Facility resulting from release(s) which occurred before September 8, 2012, i.e., "Pre-Existing Contamination", and BDH is responsible for addressing contamination at the Facility resulting from release(s) which occurred after September 8, 2012, i.e., "Post-September 2012 Contamination."

The UDEX release was discovered in 2018 during a routine groundwater gauging event being performed by Stantec on behalf of Evergreen. Stantec observed first occurrences of apparent light nonaqueous phase liquid (LNAPL) in facility monitoring wells S-414 and S-283, and an increased apparent LNAPL thickness (ANT) in well S-382. Samples of the LNAPL were submitted to the PES Laboratory for analysis and comparison to facility products and intermediates, during which the samples were indicated to primarily represent a refinery intermediate called reformate. By late July 2018, PESRM had identified the underground portion of the leaking product line that conveyed reformate through the release area (a feed from an UDEX unit) and emptied, isolated, and bypassed that section of underground pipe. Stantec estimated that between 200,000 to 400,000 gallons of reformate had been released from the pipe underground.

A Notice of Intent to Remediate (NIR) to enter the UDEX release into the Act 2 Program was completed in March 2022 and revised in May 2025 (**Appendix A**). Documentation of public notification for this report is included in **Appendix B**.

[1] Evergreen Resources Management Operations, a series of Evergreen Resources Group, LLC, is managing the legacy remedial work for Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC ("Evergreen") and Sunoco (R&M), LLC. For clarity, Sunoco, Inc. n/k/a ETC Sunoco Holdings LLC, Sunoco, Inc. (R&M) f/k/a Sunoco (R&M), LLC n/k/a Energy Transfer (R&M), LLC effective 4/19/2021 and Evergreen shall be referred to collectively as "Evergreen" in this Report.

1.1 Facility Description

The facility is located in south Philadelphia (**Figure 1-1**). The portion of the facility on the east side of the Schuylkill River is currently being redeveloped. The UDEX release is located within the redevelopment area in the former south yard of the Point Breeze Refinery Impoundment Area. This portion of the facility is designated as Area of Interest (AOI) 3 by Evergreen. Historical operations and investigations that occurred in AOI 3 unrelated to this release were previously described in Evergreen's *Area of Interest 3 Remedial Investigation Report* (Langan, 2017) which was approved by the Pennsylvania Department of Environmental Protection (PADEP) on June 14, 2017.

1.2 Facility Operational and Regulatory History

The PES Refinery ceased operations in 2019. Up until that point, the facility and its predecessor, the Philadelphia Refinery, operated nearly continuously for over 100 years as a crude oil refinery. A brief timeline for the ownership and regulatory history relevant to the UDEX release is as follows:

- 2012: The former Philadelphia Refinery was transferred from Sunoco to PESRM and became known as the PES Refining Complex during the time that it was operated by PESRM.
- 2019: PESRM announced the closure of the former PES Refinery. All refinery operations ceased at this time.
- 2020: PESRM was purchased through a bankruptcy sale by HRP Philadelphia Holdings, LLC in June 2020.

Remediation activities are being conducted at the facility by both BDH, formerly PESRM, and Evergreen in accordance with the 2012 CO&A and the 2020 CO&A Amendment. In accordance with the CO&A, Sunoco/Evergreen is responsible for addressing Pre-Existing Contamination, and BDH is responsible for addressing Post-September 2012 Contamination.

1.3 Selection of Constituents of Concern and Applicable Standards and Screening Values

Through chemical fingerprinting and operator knowledge, the product released from the underground UDEX conveyance line is understood to be reformate, a highly volatile gasoline feedstock enriched in benzene and toluene. The constituents of concern (COCs) for soil and groundwater are therefore limited to benzene and toluene as these two compounds are the primary constituents of reformate (see additionally PESRM safety data sheet [SDS] in **Appendix C**) and have been detected at elevated concentrations in the release area. Elevated detections of other, heavier volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), or metals that have been confirmed to exist in soil and/or groundwater in proximity are assumed to predate the UDEX release and are Pre-Existing Contamination. Evergreen established a "short list" of petroleum compounds for the former Philadelphia Refinery Act 2 reporting that were carried through fate and transport assessment (Stantec, 2025). As discussed further in **Section 5** and **Section 6**, the other VOC and SVOC compounds identified in

subsurface media are helpful in distinguishing the UDEX release from Pre-Existing Contamination; therefore, the short list is used as the basis for the compounds selected for reporting on the analytical tables presented in this RIR.

The selected standard for this release under Act 2 is the site-specific standard (SSS). As the current and anticipated future use of the facility is non-residential, standards for non-residential properties were chosen for comparison.

1.3.1 Soil

As the release occurred in the subsurface, only subsurface soil could have been impacted by the release. Accordingly, only data for subsurface soil samples were evaluated. To assess results from soil sampling, concentrations were screened against the following criteria:

- PADEP non-residential, used aquifer (total dissolved solids [TDS] less than or equal to 2,500 micrograms per liter [µg/l]) Medium Specific Concentrations (MSC) soil to groundwater (S to GW) value which was determined by selecting the highest value of either 100 times the groundwater MSC or the generic value MSC;
- PADEP non-residential direct contact MSC, 2-15 feet below ground surface (bgs); and,
- United States Environmental Protection Agency (EPA) Region 3 Regional Screening Levels (RSLs) for Industrial Soil (Target Risk=1E-06, Hazard Quotient=0.1)

PADEP has expressed that comparison to the MSCs is appropriate for evaluation of delineation of COCs under the SSS. PADEP has also indicated that comparison to the identified set of EPA RSLs is a conservative screen that accounts for cumulative risk and is used as a tool for evaluation in this report.

1.3.2 Groundwater

Groundwater sampling analytical results were screened against the PADEP MSCs for non-residential properties overlying used aquifers with total dissolved solids (TDS) less than or equal to 2,500 µg/l (the Statewide Health Standard [SHS]).

1.3.3 Surface Water

Diffuse groundwater discharges to Schuylkill River surface water have been identified as a potentially complete migration pathway. To meet the requirements of an Act 2 RIR, an evaluation of compliance with applicable surface water standards must be performed per Title 25 Pennsylvania Code Section 250.406(c).

1.3.3.1 Benzene

Per Title 25 Pennsylvania Code Section 93.9(e), the tidal Schuylkill River is not classified as a potable water source, and as such, the PA Code Chapter 93 Human Health Criteria for benzene in surface water is not applicable to the lower tidal Schuylkill River. EPA recommends applying organism-only Ambient

Water Quality Criteria (AWQC) to a water body where the designated use includes supporting fishable uses under Section 101(a) of the Clean Water Act, but the water body is not a drinking water supply source.

In developing the human health AWQC for benzene, EPA considered all available toxicity values for both carcinogenic and non-carcinogenic toxicological effects. As described in the 2000 Methodology (USEPA, 2000), where data are available, EPA derives AWQC for both carcinogenic and non-carcinogenic endpoints and recommends the more protective value(s) for the human health AWQC. Using this protocol, the most appropriate human health screening level for benzene in surface water in the lower tidal Schuylkill River is 90 µg/L (human health AWQC for benzene in surface water based on non-carcinogenic effects and ingestion of organisms only), as it is the most protective value based on carcinogenic and non-carcinogenic human health endpoints and ecological endpoints. Using 90 µg/L as the surface water criteria for benzene to be achieved via groundwater remediation will result in attainment of surface water quality standards protective of human health for fish ingestion.

The PA Code Chapter 93, Table 5 screening levels (130 ug/L criteria continuous concentration [CCC] and 640 ug/L criteria maximum concentration [CMC]) have been selected as the standards for benzene that would be sufficiently protective of aquatic ecological receptors.

1.3.3.2 Toluene

Although the PA Code Chapter 93 Human Health Criteria for toluene is not applicable to the lower tidal Schuylkill River for the same reason as previously described, the PA Code Chapter 93, Table 5 criteria for toluene (57 ug/L) has been selected as the standard for human health and is more conservative than the human health AWQC for consumption of organisms only (520 ug/L). Similarly, the PA Code Chapter 93, Table 5 ecological screening levels (330 ug/L CCC and 1,700 ug/L CMC) have been selected as the standards for toluene to be protective of aquatic ecological receptors.

Detailed evaluations of potential risks to human health and ecological receptors, including an assessment of exposure pathways, will be further discussed in the forthcoming Human Health Risk Assessment (HHRA) and Screening Level Ecological Risk Assessment (SLERA), respectively.

2 Environmental Setting

This section summarizes the geologic framework and general hydrogeologic properties of sedimentary deposits and bedrock underlying the south Philadelphia area, with emphasis near the facility. A brief discussion of historical and present-day topography and hydrology is also included. The analysis describes the hydrogeologic environment of the facility area serving as the basis for conceptual site model (CSM) development which is detailed for the UDEX release in **Section 4** through **Section 6**. In general, the groundwater resources and stratigraphic framework of the area have been well-documented through a variety of data sources, including Evergreen RIRs for the former Philadelphia Refinery, previous groundwater resource investigations dating back to the early 1900's, state and federal geologic mapping projects, and groundwater modeling studies.

The above information was reviewed and summarized in Stantec's (2025) *Sitewide Fate and Transport Remedial Investigation Report, Former Philadelphia Refinery* (Volume 2 of a Combination Act 2 Report completed for Evergreen). This section was adopted from Stantec (2025) and reduced to support the UDEX release characterization. Fifteen stratigraphic profiles, composited geologic maps, and a facility-wide geologic model were presented in Stantec (2025) to support Evergreen's facility-wide CSM and groundwater flow (GWF) model development. The comprehensive, sitewide study included the review and interpretation of more than 750 well and test boring logs supporting the Evergreen GWF model development through the evaluation of the lithologic character, geographic extent, and thickness of geologic units identified through correlation to published geologic formations. The Evergreen GWF model is being used, with Evergreen's permission, as the basis for the UDEX release fate and transport assessment presented in this RIR.

Because the 2025 Evergreen Sitewide F&T RIR was approved by PADEP and is publicly available under Act 2, it was considered not necessary to include or reproduce all the environmental setting figures from that RIR for this report. Rather, selected figures have been included in **Appendix T** for ease of reference. These include Evergreen Stratigraphic Profiles E – E' and F – F' which are pertinent to the project and support the UDEX release site-specific geology discussion. Note that two additional cross sections were developed specifically to support UDEX release geologic and hydrogeologic interpretations and are discussed in **Section 4** of this report. The UDEX release cross sections introduce interpretation of the additional subsurface data collected during recent UDEX release remedial investigations discussed in **Section 3.3** and should be considered as refined versions of the previous profiles developed for the former Philadelphia Refinery.

2.1 Hydrology and Topography

The former PES refinery facility occupies an area of approximately 2.2 square miles adjacent to the Schuylkill River near its confluence with the Delaware River. This region has a long history of human influence and disturbance, dating back to the early 17th Century when European settlers first arrived. The following sections present a brief discussion of the significant land surface morphologic changes that are apparent when comparing modern environments and topography to that shown on historical maps. These changes are important to note in this RIR when considering natural hydrologic conditions, drainage, and the potential for preferential flow paths in the subsurface that may influence the fate and transport of UDEX release contaminants.

2.1.1 Historical Topography and Natural Depositional Environments

Historical maps and photographs of south Philadelphia indicate that much of the land area near the facility was once tidal marsh and lowlands that fringed the Schuylkill River. Figure 2-3-1 (**Appendix T**) presents a geo-referenced USGS topographic map from 1898 (20-foot contour interval). The map indicates that several small tributary streams once dissected that marshland and presumably would have exchanged water with the tidal Schuylkill River. An upland terrace and several small islands were present

above the lowlands representing the erosional remains under a landscape that formed through repetitive cycles of river incision in response to climate changes through the Pleistocene.

Additional historic maps indicate that by 1900, an earthen dike had been constructed along the banks of the lower Schuylkill River, and sluices were present at each stream/ditch confluence. Other maps show wooden pilings in places along the Schuylkill River. In general, the construction of containment dikes, sluices, and other shoreline hardening features would have altered the natural tidal exchange between the Schuylkill River and these historic creeks, thereby limiting the natural accretion of sediment in the marshes that once fringed the river. Moreover, the modifications indicated on these maps would have altered the pre-existing tidal regime and dynamic equilibrium of the Schuylkill River.

2.1.2 Post Industrialization

The facility area has a long history of petroleum industry dating back to the early part of the 19th Century. Figure 2-3-1 (**Appendix T**) indicates that by 1898, storage of petroleum near Point Breeze and Gibson Point had already begun. According to City of Philadelphia archives (City of Philadelphia, 2017), much of the remaining tidal marsh and lowland environments nearby were reclaimed and routinely dewatered for farming practices around this same time (generally on the west side of the Schuylkill River). Industrialization warranted further land filling activity and shoreline hardening, including bulk-heading and filling of the tributary streams that modified and generally raised the antecedent topography into its present-day configuration (note that ongoing earthwork associated with facility redevelopment continues to raise the former marsh areas). Farms were displaced in favor of industrial and commercial land uses. Although some clusters of residential property and open space have existed or still exist near the facility, the greater part of land in south Philadelphia has been used for industrial and commercial purposes for over 100 years (IST, 1998).

A high-resolution land surface elevation model with integrated bathymetry, obtained from the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI) in 2017 indicates that recent topography is relatively flat near the facility, and land surface elevations generally range from a few feet below the North American Vertical Datum of 1988 (NAVD 88) near Mingo Creek to approximately 35 feet near the eastern boundary of the facility (Figure 2-3-2; **Appendix T**). This elevation range remains true of the area even when factoring in BDH's facility redevelopment. The elevation model subtly displays topographically low areas that, based on location, likely correlate to the locations of former stream valleys shown on the earlier maps. In addition to raising the land surface, many of the filled urban areas were either paved and/or rendered relatively impervious. These conditions further alter the natural hydrology of the area and become important factors in evaluation of local water-table conditions and the sources and sinks of water in the GWF model.

2.1.3 The Schuylkill River

The Schuylkill River bisects the former PES refinery facility and is a tidal river that experiences astronomical tides on a semidiurnal scale. Schuylkill River depths in the area generally range from less than 1-foot mean lower low water (MLLW) where shoaling is apparent to more than 45 feet MLLW in areas of scour (Figure 2-3-2; **Appendix T**). The head of the tide is located north of the facility at

Fairmount Water Works Dam near Fairmount Park in the City of Philadelphia. According to data obtained from the USGS tide gauge near 30th Street (USGS Station 01474501), the tidal amplitude in the river ranges up to approximately 7 feet per semidiurnal cycle (generally from -3 feet to 4 feet NAVD 88). Cyclical fluctuations of the surface water level in the Schuylkill River may directly or indirectly propagate landward and affect groundwater levels at the facility.

Stantec (2025) presented hydrographs from data loggers deployed at the former Philadelphia Refinery that indicate Schuylkill River tides influence groundwater levels but that the magnitude is greatest very close to the river and in the deeper, lower aquifer (see **Section 4.2**). UDEX release specific hydrographs from data loggers are discussed in **Section 4.2** and displayed on **Figure 4-6**. River bulkheads, low permeability sediments/fill, and/or the relative elevation of the bottom of the water-table aquifer when compared to the river elevation may explain these observations. This finding agreed with that of Greenman et al. (1961) for the nearby Delaware River and Weston (2004) for groundwater conditions at the adjacent Philadelphia Gas Works (PGW) Passyunk Facility (see **Figure 1-1**). The nearly synchronous timing of the arrival of tides in lower aquifer wells close to the river supports that there may be a direct connection between the lower aquifer and the Schuylkill River. Stantec suspects the degree of connection may be greatest where shallow bedrock is present beneath the Schuylkill River and/or where the river is deeply scoured and/or maintenance dredged (e.g., scour between the Passyunk Avenue bridge pilings).

2.2 Geologic and Hydrogeologic Framework

The facility occurs within the up-dip limits of the Atlantic Coastal Plain, generally within one mile of the "Fall Line," where crystalline bedrock of the Appalachian foothills intersects the ground surface (outcrops). The Atlantic Coastal Plain is a physiographic province that is defined as having relatively flat topography and as being underlain by a characteristic wedge of unconsolidated sediments that thicken in a southeasterly direction, away from sediment source areas in the Appalachian Mountains. These sediments were deposited atop a sloping bedrock surface in complex fluvial, estuarine, and marginal marine environments along the passive Atlantic margin. In general, the resulting sedimentary record and stratigraphic framework beneath the former PES Refinery facility is complicated, largely incomplete, and under-represented by only Cretaceous and Quaternary deposits, separated by a regional disconformity. Figure 2-3-3 and Figure 2-3-4 (**Appendix T**) document available bedrock and surficial geologic map data from published sources in Pennsylvania and New Jersey, supplemented by an interpretation of the surficial geology of the facility area in regional context (Stantec, 2025). A generalized stratigraphic column adopted and modified from Schreffler (2001) and Stantec (2025) is included as **Table 2-1** to support the discussion below.

2.2.1 Coastal Plain Stratigraphy

2.2.1.1 Anthropogenic Fill

Much of the facility and surrounding urban area is underlain by historical fill material, which was primarily placed for the purpose of reclaiming lowlands along the banks of the tidal Delaware and Schuylkill Rivers during industrialization. These fill materials are heterogeneous in nature and have been described on borehole logs by others as a mixture of compacted soil and anthropogenic debris, including sand, clay,

silt, gravel, cinders, concrete, asphalt, crushed stone, ash, glass, brick fragments, and wood. Apparent fill thickness ranges from a veneer where antecedent topography was highest to greater than 50 feet where it was used as railroad ballast just east of the facility. Within the locations of former stream valleys, marshes, and borrow pits, the historical fill material is generally 20 feet or greater in thickness (Stantec, 2025).

Fill materials are observed as both saturated and unsaturated deposits depending primarily on topographic position. Generally, at locations distal to the Schuylkill River, fill occurs above the regional water-table under average hydraulic head conditions. Fill has been observed to support isolated lenses of perched groundwater in areas where coarse or granular material is separated from the underlying water table by low permeability sediments. Fill has also been observed to be saturated and/or in hydraulic connection with the water table along the axes of buried stream channels, where the water-table appears to intersect the fill (former gaining stream reaches). Lastly, where fill was placed to reclaim tidal wetlands such as areas just west of the UDEX release, it generally supports a mounded water table and may exhibit continuous water bearing properties.

2.2.1.2 Quaternary Deposits

Quaternary sedimentary deposits are present beneath the facility and are generally representative of geologically-recent cycles of deposition and erosion that occurred within the last 200,000 years. These cycles of sedimentation were the result of a series of glacial and interglacial periods, namely the Illinoian and Wisconsinan glaciations, separated by an intervening interglacial period and followed by the present interglacial period through the Holocene (Sevon et al., 1999). Depositional environments through this period were primarily controlled by sea level and the successive down-cutting, meandering, and infilling of ancestral river valleys, primarily that of the Schuylkill and Delaware Rivers (Owens and Minard, 1979). Details of the Quaternary deposits present at the facility are described in the following sections.

2.2.1.2.1 Recent (Holocene) Alluvium

Predominantly gray, muddy deposits with occasional sandy, gravelly, and organic-rich lenses comprise the youngest alluvium present near the facility. These sediments were deposited in dynamic floodplain, channel, and marsh environments through the Holocene and are generally restricted to elevations below present-day sea level. The recent alluvium ranges in thickness from a few feet to as much as approximately 60 feet (to elevations as low as approximately -70 feet NAVD 88). Figure 3-2-1 (**Appendix T**) provides some estimation of how extensive the area's tidal marshes once were prior to development, existing generally along the Schuylkill River south of and surrounding Point Breeze. Stratigraphic profiles E – E' and F – F' (**Appendix T**) exemplify this interpretation and distribution of the recent alluvial deposits at the facility.

Because of its relatively young geologic age and stratigraphic position along the Schuylkill River and tributary creeks, recent alluvium in proximity of the facility is often poorly consolidated and saturated with groundwater. However, it generally has limited water-transmitting capabilities due to its predominantly fine-grained texture. The regional water-table surface occurs within or just above the Holocene alluvium in former marsh areas along the Schuylkill and Delaware River estuaries.

2.2.1.2.2 Pleistocene Alluvium

Geologically-recent glacial outwash deposits, commonly referred to informally as the "Trenton gravel," have long been recognized in southeastern Pennsylvania along the Delaware River valley. Sevon and Braun (2000) provide a comprehensive map of glacial deposits in Pennsylvania, including the presence of sand and gravel outwash, interpreted as stratified drift, along the present Delaware River. This and other interpretations available in literature and the nomenclatures utilized in Pennsylvania have been difficult to apply in a regional context when the geology mapped in neighboring states is considered. Stantec (2025) adopted a more recent interpretation of the Pleistocene deposits in southeastern Pennsylvania presented by Jengo (2006) in which the stratigraphic nomenclature includes the glaciofluvial "Trenton gravel" as being spatially restricted to the lower portion of the Delaware River paleochannel, beneath the Holocene transgressive sequence of deposits. Within the facility and proximity where maximum land surface elevations rarely exceed approximately 35 feet NAVD 88, the Pleistocene alluvium is more appropriately assigned to the Cape May Formation Unit 2 terrace (see Figure 3-2-4; **Appendix T**).

For the purposes of this RIR, it is considered reasonable to generally describe the Pleistocene deposits as Pleistocene alluvium and distinguish them from the Holocene alluvium. This overall distinction is considered critical to mapping extent in the CSM because the permeabilities from a contaminant fate and transport perspective are typically very different. Near the facility, Pleistocene alluvium is commonly described on boring logs as a brown to reddish-brown fine to coarse sand with lenses of gravel. The gravel fraction is often multicolored and comprised of a mixture of sub-angular to sub-rounded, sedimentary and metamorphic rocks derived from the Appalachian Piedmont. Stratification is common and secondary lithologies can include silt/clay beds with peat, silty sand, and silty gravel. The Pleistocene alluvium generally ranges in thickness from approximately 10 to 30 feet near the facility. It is commonly capped by fine-grained, muddy deposits that are distinctly different from the Holocene alluvium. The greater part of Pleistocene alluvium is laterally continuous, and its thickness depends on the antecedent Cretaceous topography that it filled and on the degree of erosion from above. Along the present-day Schuylkill River, Stantec (2025) mapped Pleistocene alluvium to be present beneath thick sections of Holocene alluvium to elevations lower than -70 feet NAVD 88 (**Appendix T**) interpreted to represent glacial-age tributary (Schuylkill River) alluvium.

The regional water-table in the facility area often occurs within the Pleistocene alluvium. In support of developing Evergreen's GWF model, Stantec (2025) compiled published aquifer testing data to summarize a reasonable range of hydraulic property potential for the water-table (and lower aquifer) (see Figures 2-3-20 through 2-3-22; **Appendix T**). Compilation of hydraulic conductivity (k) estimates from testing data indicates that the Pleistocene-age alluvium in the facility area has the potential to range from less than 1 foot per day (ft/d) to over 600 ft/d. The observed wide range in k values over relatively short distances is consistent with the water-table aquifer's lithologic heterogeneity which can be attributed an appreciable amount to the nature of the Pleistocene deposits. Site-specific aquifer testing results for the UDEX release are discussed in **Section 4.2** and displayed on **Figure 4-5**.

2.2.1.3 Cretaceous Deposits

Many studies of the Atlantic Coastal Plain near the facility have identified the presence of Cretaceous-age sediments in the subsurface. Figure 2-3-3 (**Appendix T**) depicts the subcrop areas of Cretaceous geologic units across the Delaware River in New Jersey that notably include the Potomac and Magothy Formations. Extrapolation of the Cretaceous units into Pennsylvania has not been formally completed although some authors have indicated their likely presence (Greenman et al., 1961; Navoy and Carlton, 1995). These are the oldest sedimentary deposits in the area and are configured in a southeasterly-thickening wedge, overlain by the much younger Quaternary deposits, and underlain by Piedmont crystalline bedrock. In south Philadelphia, the Potomac-Raritan-Magothy (PRM) aquifer system was developed from the regional geology and subdivided into six units in order of increasing age (Schreffler, 2001):

- upper clay unit
- upper sand unit
- middle clay unit
- middle sand unit
- lower clay unit
- lower sand unit

Sugarman (2017) utilized recent borehole data from offshore New Jersey drilling to refine understanding of the PRM aquifer system relevant to the study area, which indicated that the lower and middle sand units (aquifers) correlate to the Potomac Formation and the upper sand unit likely correlates to the Magothy Formation. Near the facility, it is generally true that the PRM units are discontinuous, relatively thin, intercalate, and exhibit gradual facies changes that make mapping the overall sequence difficult. Where sand units are present discretely or in continuity with other sandy deposits, they can form a deeper (lower) aquifer or account for a portion of the water-table aquifer. Total thicknesses of PRM deposits near the facility range from 0 feet, where Quaternary deposits are present atop bedrock, to more than 100 feet within paleochannels incised into bedrock (**Section 2.2.2**). Details of the individual units and bedrock configuration from Stantec (2025) are presented for the region in the following sections.

2.2.1.3.1 Upper Clay Unit

The upper clay unit is a variegated clay/silt that is sometimes discernible from older clay units of the PRM where sandy and gravelly. In general, it is thin when compared to the other PRM clay units in south Philadelphia, and in places distal to the Delaware River, the upper clay may be entirely absent (Greenman et al., 1961). At the facility, Stantec (2025) assigned the upper clay to first occurrences of light brown, tan, mauve, yellow, gray, and less-commonly, red sandy, silty clay beneath the Quaternary alluvium. Mapping through correlation indicates that the upper clay unit pinches out throughout much of the facility where it was truncated by younger deposits.

The upper clay unit by nature acts as an aquitard. Where present, it can create hydraulic separation between the upper sand unit and overlying Quaternary deposits. Stantec (2025) presented permeability estimates for the upper clay unit in former Philadelphia Refinery AOI 4 where it was estimated at 6.2×10^{-4} feet/day (ft/d).

2.2.1.3.2 Upper Sand Unit

The upper sand unit is varicolored but predominantly brown to gray sand with varying amounts of gravel, clay, and silt (Greenman et al., 1961). Nearer the facility, it has been described as mostly silty and/or clayey fine to medium sand (IST, 1998). Where the upper clay is absent, the upper sand occurs directly beneath, and is typically discernable from, the overlying coarser, poorly-sorted, and more heterogeneous Pleistocene alluvium. According to Stantec (2025), the upper sand appears most extensive beneath eastern portions of the former Philadelphia Refinery facility (AOIs 1, 4, and parts of AOI 8). The upper sand unit, where present, rarely exceeds 10 to 20 feet in total thickness and is thickest along the axes of troughs cut into the middle clay unit.

The upper sand unit can be a highly productive water bearing zone where its thickness and extent are sufficient (Greenman et al., 1961). Aquifer testing of the upper sand unit in New Jersey has indicated that the aquifer has similar hydraulic properties to the middle and lower sand units where discrete (Navoy and Carleton, 1995). Stantec (2025) did not identify any existing testing data for wells discretely screened within the upper sand unit from which to infer sole hydraulic properties of the unit. Because of the discontinuous nature of the upper clay, the upper sand comprises a portion of the water-table aquifer. Most wells that fully penetrate the water-table aquifer at the facility may intersect and be influenced by the hydraulic properties of the upper sand.

2.2.1.3.3 Middle Clay Unit

Whereas other clay units of the PRM are described as sandy and gravelly in places, the middle clay unit is generally regarded as being a laterally extensive and uniformly massive aquitard consisting of thick, red and white clay with very little sand (Greenman et al., 1961). Near the facility, others have found the middle clay to be nearly continuous in the subsurface (IST, 1998). Stantec (2025) agreed with these previous findings and mapped the middle clay unit of the PRM to be the prevailing PRM aquitard underlying the facility, creating hydraulic separation between the water-table aquifer and deeper, semi-confined aquifer.

Stantec (2025) discussed details of the nature and extent of the middle clay and included a figure of the middle clay thickness (see Figure 3-2-23; **Appendix T**). Where present, thickness of the middle clay unit generally ranges from less than one foot to more than 20 feet. Notably the interpreted middle clay unit is absent in areas along the perimeter of the Schuylkill River where recent alluvial deposits prevail and along the eastern margin of the former Philadelphia Refinery where incised and infilled by upper sand deposits. The middle clay's characteristically muddy texture can vary and become finely-laminated/bedded and intercalated with muddy sand in places under the facility.

Where the middle clay is present, there exists the potential for vertical groundwater exchange (leakage) to occur through the aquitard that is dependent on the permeability of the middle clay among other factors. Stantec (2025) included review of middle clay unit permeabilities from former Philadelphia Refinery facility laboratory testing data that suggested the middle clay permeability may be reasonably estimated between 10^{-3} and 10^{-5} ft/d. This result supports that the middle clay is relatively impervious where present and where its lithology is predominantly clay and silt.

2.2.1.3.4 Middle Sand Unit

The middle sand unit is a light-colored, stratified, fine to coarse sand with occasional gravel and clay that was generally deposited in lenticular masses along the axes of troughs carved into the lower clay unit (Greenman et al., 1961). As such, it is by nature discontinuous in the region. Stantec (2025) mapped the presence of middle sand at the facility based on stratigraphic position as the first occurrence of sandy deposits beneath the middle clay and above a finer-grained, lignitic, and often clayey marker bed first identified in proximity to the Belmont Terminal property. The middle sand is commonly described on boring logs as brown, orange, or reddish-brown sand and gravel. The middle sand unit has been observed at thicknesses up to approximately 30 feet beneath the facility and often terminates in a gravelly contact through a series of fining-upward sequences. In areas where erosion removed the lower clay marker bed, it is usually distinguishable from the lower sand unit by a sharp transition to fine to medium-grained, white/gray sand with clay/silt.

Much like the other sand units of the PRM, the middle sand unit can be a prolific aquifer where it is laterally continuous and of sufficient thickness. Aquifer testing of the middle sand in New Jersey has indicated that the aquifer has similar hydraulic properties to the lower sand unit (Navoy and Carleton, 1995). The same can be said for lower aquifer wells tested at the facility, many of which are screened across portions of the middle and lower sands (see Figure 2-3-21; **Appendix T**).

2.2.1.3.5 Lower Clay Unit

Published descriptions of the lower clay unit indicate that it appears very similar to, and is sometimes inseparable from, the middle clay unit where the middle sand is absent. The lower clay is generally a dense red clay but is known from drilling records to contain softer zones of gray clay stratified with fine sand. The lower clay tends to exhibit its greatest thickness along the lateral margins of paleochannels in underlying bedrock and can be thin to absent along the axes of paleochannels where eroded prior to deposition of the middle sand unit (Greenman et al., 1961).

Of the PRM clay units, Stantec (2025) interpreted the lower clay unit to be the least significant at the facility in terms of both its lateral extent and vertical thickness. This is based on stratigraphic correlation and likely the result of erosion prior to deposition of the middle sand. Generally dark gray and red, commonly sandy clay and muddy, lignitic sand zones were assigned to the lower clay if observed below the middle sand prior to transition into the lower sand. Where present, the lower clay was observed at thicknesses ranging from less than 1 foot to no greater than 10 feet. In a regional context, the lower clay may create localized areas of hydraulic separation between the middle and lower sands. Much like the middle clay, the lower clay appears to thicken and become more continuous to the south and east of the facility.

2.2.1.3.6 Lower Sand Unit

Greenman et al. (1961) indicated that the lower sand unit is a varicolored but predominantly white to yellow sand with gravel, usually fining upward to a cap of fine to medium sand with occasional yellow and gray clay lenses. The lower sand unit is the oldest of the PRM deposits and rests unconformably atop

bedrock. The lower sand is generally thickest (up to 87 feet thick) along the axial troughs of paleochannels carved into bedrock by flow through former positions of the Schuylkill and Delaware Rivers (Greenman et al., 1961).

At the facility, Stantec (2025) recognized the lower sand unit as a nearly continuous deposit, except for areas proximal to the Schuylkill River where it appears that the river entirely removed the PRM. Under former Philadelphia refinery AOI 8 and parts of AOI 1 and AOI 2, the lower sand pinches out in a northwesterly direction, where bedrock gradually rises in elevation towards the Fall Line, generally around elevation -50 to -60 feet NAVD 88. Where present, the lower sand unit is observed to range in thickness from approximately 10 feet to a maximum of just over 20 feet beneath the facility in agreement with published descriptions of yellow, white, and pale gray, predominantly medium to coarse sand with gravel, or gravel with sand. In addition, the upper zone of the lower sand is typically muddy.

Stantec (2025) summarized hydraulic information available for the lower aquifer based on estimates obtained from well testing at the facility and from nearby properties (see Figures 2-3-21 and 2-3-22; **Appendix T**). At the Philadelphia Naval Shipyard (PNSY), historical pumping test data are available providing estimates of regional hydraulic properties for the lower sand unit that can be reasonably applied to the lower aquifer at the facility. This data indicates an average hydraulic conductivity value of approximately 134 ft/d (Greenman et al., 1961). At the facility and adjoining Belmont Terminal, Stantec completed slug and short-duration pumping tests on 11 wells open to the lower aquifer. Values of hydraulic conductivity estimated for the lower aquifer from the slug testing range from approximately 3 ft/d to more than 800 ft/d and may include hydraulic properties of the middle sand, lower sand, and/or Pleistocene alluvium (glacial-age tributary alluvium beneath the Schuylkill River).

2.2.2 Bedrock

Bedrock beneath the Coastal Plain in south Philadelphia has been inferred from surface outcroppings above the “Fall Line,” and has been described in the subsurface where penetrated by past drilling activities. Bosbyshell (2008) has mapped schist of the Wissahickon Formation as the predominant rock type occurring in Philadelphia along the “Fall Line” (see Figure 2-3-3; **Appendix T**). Most boring log records of deep holes drilled at the facility indicate that schist or saprolite with a schistose fabric is present beneath the Coastal Plain, in agreement with published maps (Stantec, 2025). Where encountered, the upper portion of bedrock has been described as clayey saprolite of variable thickness, from a few feet to greater than 70 feet.

Available data pertaining to the bedrock surface beneath the facility suggests that the surface generally dips to the southeast but is locally complex. Greenman et al. (1961) recognized the presence of four paleochannels incised into bedrock and attributed those features to previous positions of the Schuylkill River. Two of those channels occur beneath parts of the facility and influence the total thickness of the Coastal Plain sedimentary sequence above them (see Figure 2-3-24; **Appendix T**). Stantec (2025) refined the dataset on bedrock elevation revealing local detail under the facility, including small bedrock paleochannels beneath the eastern portions of former refinery AOIs 1 and 4 that appear to be extensions of the League Island Trough, and a few localized bedrock surface highs (pinnacles) particularly within AOI

8, AOI 3, and AOI 6 that appear to form the basis for meanders of the Schuylkill River south of the Fall Line (Point Breeze and Girard Point).

In general, bedrock can store and transmit groundwater primarily through secondary porosity structures (e.g., fractures, joints). Bosbyshell (2008) indicates that the Wissahickon Formation can yield up to 20 gpm based on records reviewed for well locations north and west of the facility. Balmer and Davis (1996) indicate that in Delaware County, Pennsylvania, the Wissahickon Formation is generally the peak producer of the consolidated rock aquifers present in the county and can yield anywhere from 0 gpm to 300 gpm to wells (data from 127 wells). The well data included in the referenced reports was for wells generally located above the "Fall Line" where bedrock forms the surficial unit. Note that a well search performed for this RIR and discussed in **Section 6.5** did not indicate the presence of current water supply wells extracting groundwater from bedrock in the immediate study area (**Appendix U**).

3 Environmental History, Investigation, and Remediation Summary

This section summarizes the environmental investigation history in proximity to the UDEX release. Past environmental investigations and O&M activities related to the former Philadelphia refinery are summarized in **Section 3.1** and **Section 3.2**. **Section 3.3** follows suit by summarizing the phases of characterization activities completed to delineate the UDEX release in the time since the release was discovered. See **Figure 1-2a** for the locations of investigation activities.

3.1 Past Environmental Investigations

Historical remedial investigation and site characterization activities that were conducted in/around but unrelated to the UDEX release area prior to the 2018 release discovery have been documented in Evergreen's *Area of Interest 3 Remedial Investigation Report* (Langan, 2017) and included soil and groundwater investigation activities. Of relevance to the UDEX release were the findings that at the time of the Evergreen RIR, both benzene and toluene exceeded the used aquifer, non-residential groundwater MSCs in the unconfined, water-table aquifer and that benzene exceeded the same standard in the lower aquifer. Benzene trends in both water-bearing units were noted to be increasing, and the trends were not suspected to be attributable to documented or undocumented releases from the tankage in the #5 Tank Farm. Evergreen suspected that the likely source was from a network of underground pipelines in the area. The Evergreen AOI 3 RIR was approved by the PADEP on June 14, 2017. The approval included a PADEP comment letter recommending that Evergreen further investigate the area of elevated benzene. Discussion of these historical data in context is included in subsequent sections of this RIR as applicable to characterization of the UDEX release.

3.2 Discovery of UDEX Release

In the summer of 2018, Stantec performed a routine annual, sitewide well gauging event for the facility on behalf of Evergreen. During review and analysis of the gauging data, Stantec noted a first occurrence of

apparent LNAPL in monitoring well S-414 and increased apparent LNAPL thicknesses (ANT) in wells S-283 and S-382, where LNAPL was first observed in 2017 and 2016, respectively. Stantec's field technician confirmed the gauging observations, and the findings were reported to Evergreen. Evergreen notified PESRM of the findings and on July 19, 2018, Stantec collected LNAPL samples from wells S-283, S-382, and S-414 in the presence of PES and Evergreen personnel. Stantec shipped the LNAPL samples to a contract laboratory for characterization on behalf of Evergreen, and duplicate LNAPL samples were provided to the onsite PES laboratory for analysis and fingerprinting to known products and refinery intermediates.

The PES laboratory indicated that the LNAPL was a refinery intermediate called reformate. Stantec's contracted laboratory provided a basic interpretation which indicated that the LNAPL collected from wells S-382 and S-414 was a light petroleum distillate of unknown weathering degree, and the LNAPL collected from well S-283 was chemically similar to the samples collected from wells S-382 and S-414 but also contained a relatively smaller amount of extremely weathered middle petroleum distillate. During late July 2018, PES identified the underground portion of a product line that conveyed reformate through the release area (a feed from an UDEX unit) and emptied, isolated, and bypassed that section of underground pipe (see **Figure 1-2b**). PES retained Stantec to assist on the project through characterization and initiation of remediation of the LNAPL present in the subsurface near the UDEX feed underground line release area.

3.3 UDEX Release Remedial Investigations

Following the UDEX release discovery in 2018, several rounds of investigation were completed by PESRM and, subsequently, BDH to characterize the nature and extent of its impact to the subsurface. High resolution site characterization (HRSC) technologies were employed in the approach in conjunction with more traditional tools to develop a comprehensive and sufficiently detailed CSM to meet the characterization goals while also informing interim remediation and full-scale remedial design. The investigations are presented below in the order in which they were conducted, although some investigations overlapped in time.

3.3.1 Geoprobe Direct Image® MiHpt Screening

To understand the horizontal extent of petroleum hydrocarbon contamination and hydraulic properties of the shallow subsurface within the UDEX release area, Stantec oversaw two mobilizations of a direct-push subsurface investigation by Parratt Wolff Inc. (PWI) in August and September 2018. The subsurface investigation utilized a combination membrane interface probe (MIP) and hydraulic profiling tool (HPT; combination MiHpt) on a small, track-mounted Geoprobe drill rig at 12 locations (see **Figure 1-2a**).

Prior to initiating ground disturbance activities, the boring locations were scanned by a private utility locater and cleared via hydroexcavation. The first mobilization to conduct the MiHpt subsurface investigation occurred in August 2018, wherein prepack well MW-MiHpt-08 was initially installed (now referred to as monitoring well S-432). The second mobilization in September 2018 was needed due to rig refusal and access issues encountered during the first mobilization. Twelve MiHpt borings total were

completed to depths ranging from 21 to 57 feet below ground surface (ft bgs) during the two mobilizations.

Based on the strong MIP response identified on certain depth profiles (see **Appendix M** for MiHpt depth profiles), monitoring wells S-428 through S-432 were installed at or in proximity to MiHpt boring locations as outlined below. See **Table 3-1a** for well construction details, **Table 3-1b** for MiHpt boring details and **Appendix D** for boring logs and well construction logs:

- Monitoring well S-432 (initially referred to as MW-MIHPT-08, corresponding to boring MiHpt-08) was installed using 1.5-inch pre-pack PVC and screened between 14.5 and 24.5 ft bgs during the initial phase of the subsurface investigation August 2018 (well was set directly in the direct-push borehole);
- Monitoring wells S-428 (adjacent to MiHpt-02) and S-429 (adjacent to MiHpt-08) were installed as 4-inch PVC with 15-foot and 10-foot screens, respectively. Installation of S-428 was conducted using a truck-mounted drill rig with hollow stem auger (HSA) to additionally collect subsurface soil for benzene, toluene, ethyl benzene and xylenes (BTEX) analysis via split-barrel sampler to calibrate the MIP data in September 2018;
- Monitoring wells S-430 (MiHpt-10) and S-431 (MiHpt-11) were installed as 2-inch pre-pack PVC with 10-foot screens using a direct-push rig and HSA in September 2018.

The soil BTEX results collected during the drilling of monitoring well S-429, which is adjacent to MiHpt-08/S-432, were generally in agreement with the flame ionization detector (FID) and photoionization detector (PID) peaks recorded by the MiHpt rig at MiHpt-08: benzene concentrations in soil were most elevated where the FID/PID peaks were located on the imaged profiles. Subsurface soil analytical data for Evergreen Short List VOCs and TPH are presented in **Table 3-8** and further discussed in **Section 6**. Soil laboratory analytical results are included in **Appendix F**.

3.3.2 Passive Soil Gas Survey

In August 2018, a passive soil gas survey in the UDEX release area was conducted to aid in understanding the extent of contamination associated with the reformate release. After saw cutting to remove asphalt and scanning the areas with a private utility locater, 48 passive soil gas samplers consisting of solid adsorbents enclosed inside a tubular microporous polytetrafluoroethylene (PTFE) membrane were deployed in a grid pattern within and around the release area at the locations indicated on **Figure 1-2a** over an approximate 4-day period as recommended by the vendor, Amplified Geochemical Imaging, LLC (AGI). A combination of tools including a hammer drill, hand auger, and insertion rod were used to install the samplers to depths of approximately 18 to 24 inches bgs. The samplers were then retrieved and hand-delivered to the analyzing laboratory, AGI, for analysis of total petroleum hydrocarbons (TPH), gasoline-range petroleum hydrocarbons (GRPH), diesel-range petroleum hydrocarbons (DRPH), and AGI target compound VOCs by EPA Method 8260. The soil gas analytical report is attached as **Appendix L1**.

The analytical data collected from the soil gas survey was used by AGI to generate a mapping report of soil gas concentration heatmaps (**Appendix L2**) for benzene, toluene, total xylenes, GRPH, and DRPH. Results indicated:

- the highest estimated soil gas concentrations of benzene were identified in proximity to monitoring well S-414 (sampler 38 and 39) and on the northwest side of the former central warehouse (sampler 16 and 17) (see **Figure 1-2a**);
- toluene was most elevated on the northwest side of the central warehouse (sampler 17);
- elevated concentrations of GRPH were noted in several areas including those already covered by the aforementioned COCs, with the addition of the area on the southern edge of the former central warehouse (sampler 6 and 7) as well as in proximity to and north of monitoring wells S-414 and S-439; and
- DRPH concentrations were highest in proximity to monitoring well S-414 (sampler 38), monitoring well S-433 (sampler 4), and north of monitoring well S-439 (sampler 48).

Concentrations of target compounds were notably absent/non-detect in samplers 23 and 24, however, the area where the samplers were installed was underlain by thick crushed stone and buried asphalt that could not be fully penetrated via hand digging. Soil gas concentrations for samplers 5 and 12 may similarly be biased low due to the substrate (crushed stone under asphalt) and saturation thereof in which they were installed. Interpretation and a more detailed discussion of these results can be found in **Section 6**.

3.3.3 Dakota Technologies UVOST®-HP Screening

In May 2019, Stantec oversaw a subsurface investigation in the UDEX release area using an ultraviolet optical screening tool (UVOST®) in conjunction with Geoprobe System's® (Geoprobe) Direct Image® HPT (combination UVOST-HP) operated by Dakota Technologies Company, LLC (Dakota) and PWI. The UVOST® tool was used to identify the presence and composition of LNAPL at discrete locations within and around the release area by exposing the soil as the probe is advanced to UV light: if polycyclic aromatic hydrocarbons (PAHs) are present in soil, the UV light will cause these compounds to fluoresce. This concept is also called Laser-Induced Fluorescence (LIF).

The investigation was performed with the primary objective of identifying the vertical distribution of subsurface LNAPL related to the release. Secondary objectives of the UVOST-HP work included the collection of additional permeability data for the water-table deposits in the area, qualitative and semi-quantitative data related to the type(s) of LNAPL present based on the observed fluorescence, and geologic logging of select boreholes to further characterize the geology and to validate the permeability data.

Prior to breaking ground, boring locations were scanned by a private utility locator and pre-cleared with hydroexcavation down to 5 ft bgs to explore for unknown/unidentified legacy utilities. Between May 14 and May 16, 2019, fifteen direct-push boreholes, UVHP-01 through UVHP-15, were advanced between

15 and 41.9 ft bgs (see **Figure 1-2a** for boring locations and **Table 3-1b** for boring depths). At locations UVHP-01, UVHP-07, and UVHP-08, soil borings were completed and cores were collected adjacent to the UVOST®-HP boreholes so that lithologies could be described and correlated to permeability estimated from the direct-push injection logging, and the Coastal Plain geology developed by Stantec for the greater PES Complex (Stantec, 2025). Soil boring logs can be found in **Appendix D**. Dakota's May 2019 HRSC Report that includes the UVOST-HP logs as an attachment can be found in **Appendix N**.

In July 2022, nine additional UVOST-HP borings were advanced (UVHP-16 through UVHP-24) to refine the perimeter of/further characterize the LNAPL plume body. Boring depths ranged from 17.9 ft bgs to 25.1 ft bgs. Borings UVHP-16 through UVHP-19 were advanced to delineate the northern extent of the LNAPL plume inside of the Texas Eastern/PGW natural gas metering station (see **Figure 1-2a**); UVHP-20 and UVHP-21 were advanced to delineate the eastern extent; UVHP-22 was advanced to delineate the southwestern extent; and UVHP-23 and UVHP-24 were advanced to delineate the southern extent of the plume (see **Figure 1-2a** for boring locations and **Table 3-1b** for boring depths). Dakota's July 2022 HRSC Report is included in **Appendix N**. An interpretation of the UVOST-HP logs from both UVOST investigations as they relate to LNAPL chemistry can be found in **Section 5.3**.

In December 2022, June 2023, and March 2024, Stantec, Dakota, and PWI returned to selected boring locations and repeated the UVOST® investigation to monitor remediation performance (to be further detailed in the Cleanup Plan) in the time since the initial UVOST investigation by evaluating changes in LIF over time.

3.3.4 Aestus GeoTrax Survey™ and Direct Push Confirmation Drilling Program

In November 2021, additional HRSC activities were undertaken in the UDEX release area to further characterize and delineate the vertical and horizontal extent of the LNAPL body. The HRSC investigation included electrical resistivity imaging (ERI) and a confirmation drilling program. Aestus, LLC (Aestus) was contracted to conduct ERI with the added goal of obtaining subsurface imagery of sufficiently high resolution to inform/optimize future remedial design. Stantec oversaw the installation of 14 GeoTrax Survey™ lines (URS-01 through URS-14) by Aestus between November 3 and November 10, 2021. Electrodes were driven approximately 14 inches bgs and spaced 3 meters apart, resulting in a total line length of 541 ft, allowing for imaging depths up to 108 ft bgs along each line. Cables were placed at the land surface connecting the electrodes, and a 12-volt deep cycle marine battery was used to induce a current into the ground. The locations of the survey lines are depicted on **Figure 1-2a** and are interpreted in the Aestus documentation included as **Appendix H**.

The results of the GeoTrax Survey™ were used to select follow up locations for a confirmation drilling program. The confirmation drilling program was a field program that Stantec designed and implemented to collect subsurface data in general accordance with the suggestions provided by Aestus following the GeoTrax Survey™ with the overall concept being that the wider geophysical survey provides data for a large area and is then used to hone in on target locations where contamination is most likely to be found. Confirmation drilling activities were conducted at 21 test boring locations (CD-01 through CD-12C, and additional locations OIHPT-01 through OIHPT-04) in December 2021 following completion of PA One Call

notification and private utility locating services. Drilling was performed by PWI using Geoprobe® Direct-Image® ultraviolet-range optical imaging and hydraulic profiling tools (combination OIHPT-UV) with electrical conductivity (EC) logging. Due to persistent refusal at some locations, several borings were either not completed (OIHPT-03, CD-07B, CD-09B, and CD-12A) or required offsetting to reach target depth. Test boring details can be found in **Table 3-1b,** and locations are depicted on **Figure 1-2a**. The OIHPT-UV logs have been included in **Appendix O**.

At the time of the initial confirmation drilling, five locations (CD-01, CD-03, CD-08D, OIHPT-01, and OIHPT-02) were selected for monitoring well installation. These five locations, plus two other locations not selected for monitoring well installation during the December 2021 mobilization (CD-02A and CD-09A), were slightly offset from select confirmation drilling locations and continuously cored with dual tube samplers to calibrate and ground truth the OIHPT-UV imagery. Soil samples were scanned with combination PID/FID monitors to assess for presence of organic/inorganic compounds, including methane. Twenty-four soil samples in total were collected and analyzed for TPH separated by carbon number into gasoline/diesel/heavier crude oil ranges by Eurofins Lancaster Laboratories Environmental (ELLE). Soil TPH results can be found in **Table 3-8** and laboratory reports are included in **Appendix F**. The soil sample locations are provided on **Figure 3-1a** and **Figure 3-1b**, respectively. A discussion of these results can be found in **Section 6**.

Following completion of the test borings, 1.5-inch pre-pack monitoring wells with 10-foot screens were installed at five locations:

- CD-01 (S-479)
- CD-03 (S-480)
- CD-08D (S-481)
- OIHPT-01 (S-482)
- OIHPT-02 (S-483)

A Stantec geologist specified well construction based on the boring data and Aestus recommendations and performed field oversight of well installation and well development activities. Boring and well construction logs are attached as **Appendix D**. Well construction details can be found in **Table 3-1a,** and monitoring well locations can be found on **Figure 1-2a**.

On January 14, 2022, Stantec and PWI revisited three confirmation drilling locations (CD-02A, CD-09A, CD-11A) with Geoprobe's® Direct Image™ OIP-UVR probe to collect additional data on fuel fluorescence where LNAPL was observed to be present in less significance but with some uncertainty due to the types of LNAPL present having weak fluorescence properties. A third mobilization occurred in February 2022 at which point monitoring wells S-484 and S-485 were installed offset from confirmation drilling locations CD-02A and CD-12B, respectively. A truck-mounted HSA rig was required to advance through the tight, dense gravels at these locations. Drilling was conducted by PWI, and oversight was performed by Stantec. The two monitoring wells were installed with 4-inch PVC casing, 10-foot screens, and finished at ground surface with 8-inch diameter flush-mounted covers. Boring and well construction logs are attached as **Appendix D**. Well construction details can be found in **Table 3-1a,** and monitoring well locations can be found on **Figure 1-2a**.

3.3.5 Environmental Forensics Program

Environmental forensics interpretive reporting was provided by ChemQuants™ Environmental Forensics (ChemQuants) on LNAPL samples collected from the UDEX release area between 2020 and 2023. Analysis of the samples interpreted by ChemQuants was performed by Alpha Analytical. Stantec collected LNAPL samples via disposable bailer from monitoring wells BF-103R, S-283, S-480, S-414, S-382, and S-439 with the primary objective of delineating the UDEX release from the comingling legacy Sunoco LNAPLs[2] also located in the UDEX release area, as well as characterizing the release/reformate chemistry. The EW-19 sample was later collected from soil vapor extraction (SVE) derived condensate. The ChemQuants interpretive report is provided as **Appendix G**. **Table 3-7** provides a summary of LNAPL samples collected within the UDEX release area. Note that Torkelson provided some of the specific gravity measurements, as indicated in the table.

Except for the LNAPL samples collected from monitoring well S-439 and extraction well EW-19 condensate which were analyzed for a subset of these, LNAPL samples were analyzed by Alpha for:

- Whole oil
- Saturated hydrocarbons
- C5-C12 PIANO VOCs
- Alkylated PAHs
- Sulfur in petroleum

ChemQuants concluded that there are mixtures of three types of petroleum products present, in varying states of decay/weathering, in the LNAPL samples analyzed in the UDEX release area: reformate (unable to be age-constrained), middle distillate (subsurface residence time of ~12 to 30 years), and light naphtha (subsurface residence time of ~16 to 40 years). Reformate was the most dominant component in the LNAPL samples collected from BF-103R, S-283, S-414, S-382, EW-19, and S-439. The LNAPL chemistry of the sample collected from monitoring well S-480 indicated it was comprised mostly of a light naphtha with reformate and middle distillate components. A more in-depth discussion of LNAPL chemistry can be found in **Section 5**, and how these LNAPL sampling results inform the CSM is further discussed in **Section 6**.

3.3.6 Rotosonic Confirmation Drilling

The ERI data obtained during the November 2021 Aestus GeoTrax™ Survey indicated the presence of deep resistive or otherwise anomalous features that warranted characterization, as these features could be indicative of preferential flow paths and/or contamination deeper in the subsurface. The features/target locations were not able to be fully explored during the previous drilling phases because of depth limitations and overall focus of the earlier efforts on prioritizing LNAPL recovery through remedial design.

[2] The “legacy Sunoco LNAPLs” constitute Pre-Existing Contamination as defined in the Buyer-Seller Agreement and are being addressed by Evergreen. Pre-Existing Contamination is not the subject of this RIR.

As such, Stantec and PWI returned to confirmation drilling locations CD-06 and CD-02A in June 2023 to characterize the lower aquifer. Confirmation boring CD-12D was additionally selected for monitoring well installation to complete characterization by adding a vertically conductive feature to the calibration dataset (exploration of a similar feature was requested by the PADEP for Evergreen's Belmont Terminal facility ERI dataset).

Rotosonic drilling methods were employed by PWI to enable collection/logging of continuous soil cores for characterization at all three locations. A PID was used to screen for the presence/absence of VOCs in the soil cores in conjunction with visual evaluation of the cores for impacts to select representative locations for soil sampling at each boring. Soil samples were analyzed for VOCs and/or TPH separated into the gasoline and heavier ranges for crude oil and distillates. Soil sample analytical results are summarized in **Table 3-8**, laboratory analytical reports are included in **Appendix F**, and boring logs can be found in **Appendix D**. A discussion of soil analytical results as they inform the site CSM follows in **Section 6**.

A Stantec geologist specified well construction based on Aestus' ERI data and field observation data during coring for the three lower aquifer monitoring wells:

- S-507 (CD-06): screened 53 to 68 ft bgs
- S-508 (CD-02A): screened 73 to 88 ft bgs
- S-509 (CD-12D): screened 71.5 to 86.5 ft bgs

The three lower aquifer wells were installed as 2-inch PVC and finished to ground surface with 8-inch diameter flush-mounted covers and concrete pads. Well construction details can be found in **Table 3-1b** and well construction logs are in **Appendix D**. Monitoring well locations can be found on **Figure 1-2a**.

Following the installation and development of lower aquifer wells S-507, S-508, and S-509, a large-scale groundwater sampling event was conducted by Stantec within the UDEX release area in July 2023. Thirty-one monitoring wells, including the newly installed lower aquifer wells, were sampled using low-flow methodology for analysis of VOCs and TPH by Alpha. Groundwater samples were additionally analyzed for a geochemical parameter suite to inform the bioactivity CSM including carbonate and bicarbonate alkalinity, nitrate nitrogen, chloride, sulfate, total sulfide, total iron, major ions (calcium, magnesium, potassium, sodium), and dissolved gases (headspace hydrocarbons methane, ethane, ethene, and carbon dioxide). Groundwater analytical VOC and TPH results are summarized in **Table 3-5**, and geochemical parameters are summarized in **Table 3-4**. Analytical reports can be found in **Appendix E**.

3.3.7 Groundwater Gauging and Sampling

Shortly after the discovery of the UDEX release in 2018, weekly water level/LNAPL thickness monitoring was initiated at the three monitoring wells where LNAPL had been observed for the first time or increasing thicknesses were identified (S-283, S-382, and S-414). Several wells were added to the weekly gauging scope at later stages of the investigation into the release, including wells that were installed as part of the investigation as detailed in the sections above, as well as pre-existing nearby monitoring wells installed by Evergreen. Liquid level measurements collected from monitoring wells in the UDEX release area

between 2017 and present are summarized in **Table 3-2,** and visualized as groundwater elevation hydrographs in **Appendix I**.

As many as nine rounds of groundwater sampling were performed at select monitoring wells within the UDEX release area since 2019, with some events shared from Evergreen facility monitoring. Monitoring wells were generally sampled using low-flow sampling methodology and PESRM/BDH samples were relinquished to either ELLE or Alpha for analysis of VOCs via EPA Method 8260. Exceptions have been noted in the preceding sections. Stabilized purge parameters have been summarized in **Table 3-3** and general chemistry parameters have been summarized in **Table 3-4.** Laboratory analytical results including the Evergreen Short List parameters, where available, have been summarized in **Table 3-5**, and laboratory analytical reports for the monitoring wells that were sampled on behalf of PESRM/BDH have been provided as **Appendix E**. Laboratory reports for monitoring wells sampled on behalf of Evergreen have been provided in previously submitted Act 2 reports by Evergreen and are not attached to this report.

A discussion and interpretation of groundwater data follows in **Section 6** and forms the basis for the initial conditions modeled in the fate and transport assessment (see **Section 9)**.

3.3.8 Bioactivity Assessment

To assess bioactivity levels in the subsurface within the area of the UDEX release, several investigative methods were employed, including the collection and analysis of groundwater for genomic sequencing and the deployment of CO2 flux samplers. The collected data was used to supplement existing data obtained during the Aestus GeoTrax Survey™ imaging completed in 2021 that identified possible locations of heightened bioactivity (elevated groundwater temperatures, electrically conductive areas with identified highly resistive areas potentially indicative of methane pockets).

In July 2023, groundwater surrogate samples collected via low-flow in the release area (BF-103R, S-438, S-508, and S-509) were sent to Microbac Labs (Microbac) and analyzed for total eubacteria/estimated bacterial biomass (EBAC) through quantitative polymerase chain reaction (qPCR) functional gene analysis and for metagenomic analysis. Estimated bacterial biomass ranged from 413,000,000 gene copies per liter (gc/L) in the sample collected at S-509 to 32,500,000,000 gc/L at BF-103R. Results have been summarized in **Table 3-6**, and the Microbac reports can be found in **Appendix S**. Groundwater collected during the same event from the aforementioned and additional wells in the UDEX release area was also analyzed for general chemistry parameters by Alpha: nitrate; chloride; sulfate; total iron; major ions; alkalinity as calcium carbonate; carbon dioxide (CO2); and dissolved gasses (headspace hydrocarbons methane, ethane, and ethene). General chemistry results have been summarized in **Table 3-4** and the laboratory analytical report has been attached as **Appendix E**.

In October and November 2023, Stantec conducted two fossil fuel trap sampling events to collect data on estimated rates of natural source zone depletion (NSZD) in the UDEX release area. E-Flux, LLC (E-Flux) supplied sorbent-based passive samplers, called Fossil Fuel Traps (FFT), and associated field components for deployment and retrieval by Stantec. Locations for FFT deployment were selected where permeability data supported favorable vadose zone soil gas flow, where reformate was the primary

LNAPL component in the plume body, and where sufficiently distanced from active SVE operations to mitigate low biased results. In October 2023, Stantec deployed two FFTs, CO2-01 and CO2-02, adjacent to monitoring wells S-439 and S-414 respectively, to passively measure CO2 fluxes at the locations shown on **Figure 1-2a**. In November 2023, three FFTs were deployed adjacent to monitoring wells S-414 (CO2-03), S-438 (CO2-04), and BF-103R (CO2-05).

To complete FFT sampling, Stantec installed 4-inch diameter receivers approximately 2 inches into the subsurface, inserted the sampler, and attached a protective rain cover. Generally, a two-week sampling period is recommended; however, following consultation with E-Flux, the sampling periods were shortened due to expected rainy weather conditions. The samplers deployed in October 2023 remained in the field for four days, and the samplers deployed in November 2023 collected data over a period of six days. Following the sampling period, the traps were removed, packed, and shipped to E-Flux. The samples were analyzed for total sorbed CO2 based on ASTM Method D4373-14 and fossil fuel-based CO2 contribution by radiocarbon analysis based on ASTM Method D6866-18. CO2 flux, which was calculated based on deployment time, was converted to a LNAPL depletion rate in gallons per acre per year (gal/ac yr). The measured rates of NSZD were similar during the two sampling events at S-414, ranging from 131 to 192 gal/ac yr; results for the samplers deployed at S-438 (136 gal/ac yr) and BF-103R (81 gal/ac yr) indicated similar rates; and results from the FFT deployed at S-439 indicated the NSZD rate could not be estimated (limit of detection is 51 gal/ac yr). Though efforts were made to avoid it, the low NSZD rates overall, and the comparatively low NSZD result for S-439, may have been the result of active SVE operations which would have functioned to scavenge CO2 from the subsurface before it could reach the traps. Results have been tabulated in **Table 3-9** and the analytical report located in **Appendix R**.

Data collected for bioactivity assessment is further discussed in the context of the CSM in **Section 6**.

3.3.9 Slug Testing

In February 2019 and April 2020, Stantec performed slug tests on a selection of UDEX release wells to establish estimates for site-specific hydraulic conductivity in the water table. Solid slugs were used to initiate instantaneous displacements in wells S-283, S-382, and S-433 through S-436 which are screened across the water table. The well responses were monitored using a vented data logger in general accordance with Butler (1998). Each well was tested three times with up to two different initial displacements to validate the assumptions underlying the analytical methods.

AQTESOLV Version 4.5 Professional was used to fit solutions to the normalized slug test recovery data for rising head tests. All tested wells exhibited overdamped/non-oscillatory responses to the slug tests. Stantec applied a combination of slug test solution methods to fit the data and estimate hydraulic conductivity, including the Bouwer-Rice (1976) or KGS Model (Hyder et al., 1994) for overdamped tests. Results of the slug testing are presented on **Figure 4-5** in combination with HPT data from injection logging, and the slug test data analyses are presented in **Appendix V**. Results are discussed in **Section 4.2.3**.

3.4 UDEX Release Remediation Summary

Remediation of the UDEX release has been a priority of PESRM and, subsequently, BDH since the release was discovered. Stantec initiated the recovery efforts and has been retained through the period of active remediation. Detailed documentation of the UDEX release remediation program will be provided in a separate Cleanup Plan document. The objective of this RIR section is to summarize key components of the remediation that has occurred to date and to introduce the subsurface information collected as a part of the remediation program. The UDEX release remediation can be summarized as follows:

- LNAPL bailing and passive skimming were performed in September and October 2018 using a combination of Evergreen monitoring wells including S-283, S-382, S-414, and later BDH monitoring well S-429 after it was installed following the MiHpt work (see **Figure 1-2a**). A total of approximately 381 gallons of LNAPL were recovered by these passive systems and manual bailing.

- Active LNAPL skimming began in late October 2018 and continued through November 2021 using monitoring wells S-283, S-382, and S-429. The recovery systems were taken offline at different times, with the S-283 system operating the longest. Approximately 96,228 gallons of LNAPL were recovered by these systems. Some groundwater was also collected by these systems, but the totals recovered were not tracked through disposal, which used the refinery's wastewater treatment system for onsite disposal.

- A SVE pilot test was initiated in April 2021 and lasted approximately three months cycling between extraction wells UDEX-EW-01 through UDEX-EW-03 using one Remediation Service International (RSI) V4 internal combustion engine (ICE) unit (see **Figure 1-2b**). Pilot testing was highly successful and transitioned directly to full-scale SVE, which included the design and installation of 21 additional extraction wells and the near continual operation of up to four RSI V3 and V4 ICE units simultaneously. Full-scale SVE continued through June 2025.

- A three-month air sparge (AS) pilot test was initiated in September 2024 to supplement ongoing SVE and enhance the removal rate of residual LNAPL and associated dissolved-phase VOCs from the saturated zone within areas proximal to monitoring wells S-414 and S-484 (see **Figure 1-2b**). Two AS treatment cells were designed and installed including 5 AS wells surrounding each of the referenced monitoring wells. An AS system trailer with a blower and 5-leg manifold was used and powered by an onboard ICE generator. AS pilot testing was successful at meeting the enhanced removal rate objective, and the combination of SVE/AS technologies went full-scale in early 2025. Two more 5 well treatment cells were added to envelop monitoring wells S-482 and S-484, and a second AS system trailer was installed and powered by a separate, onboard ICE generator. Full-scale SVE/AS continued through June 2025. It is expected that SVE/AS will continue through July 2025 using one RSI V3 ICE and one AS system trailer to complete the period of active UDEX release remediation.

- The SVE/AS remediation period accounted for the vapor recovery equivalent of approximately 196,053 gallons of LNAPL bringing the total recovery for the remediation program to approximately 292,662 gallons through June 13, 2025.

Additional details of the LNAPL characterization are presented in **Section 5** and well logs for the SVE and AS wells are included in **Appendix D**.

4 Site-Specific Hydrogeologic Conditions

In **Section 2**, details regarding Stantec's interpretation of regional geologic conditions were presented. The purpose of this section's discussion of site-specific conditions is to refine the regional hydrogeologic framework to summarize conditions observed beneath the UDEX release, with an emphasis on groundwater occurrence, groundwater flow, and hydraulic head potentials.

As documented in **Section 3**, much of the data pertinent to the UDEX release was collected through numerous site-specific investigations. However, through collaboration with Evergreen, BDH and Stantec have incorporated Evergreen subsurface data from former Philadelphia Refinery investigations as appropriate to complete the characterization described below. Specifically, Stantec has utilized well log, well gauging, and groundwater analytical data from some preexisting Evergreen wells and incorporated those data into the discussion and supporting figures, tables, and appendices. Monitoring well construction and soil boring logs reviewed for the UDEX release characterization are included in **Appendix D**. Direct-push soil boring logs for the MiHpt, UVOST, and OiHpt surveys are included as **Appendices M**, **N**, and **O**, respectively. A tabular summary of the wells, including construction details, soil and direct-push borings, and well gauging data used in groundwater contouring and evaluation of recent groundwater conditions for the study area are included as **Tables 3-1a, 3-1b**, and **3-2**, respectively.

4.1 Geologic Formations and Units Observed

Stantec has interpreted the following stratigraphy in the subsurface beneath the UDEX release. A generalized stratigraphic column adopted from Schreffler (2001) is included as **Table 2-1** and discussed further in **Section 4.2** in the context of interpreted hydrostratigraphy. This section should be viewed as an update to the CSM geologic conditions presented in Stantec (2025) for the former Philadelphia refinery AOI 3 area proximal to the UDEX release. The objective was to add as much additional detail as possible from the many HRSC investigations performed to support delineation and remediation of the UDEX release.

To achieve the objective, Stantec built a digital geological model using Leapfrog Works Version 2024.1.2 software (Bentley Systems, 2023). The Evergreen CSM stratigraphic picks from Stantec (2025) were combined with additional picks identified on borings from the UDEX release datasets. Multiple lines of data informed this model, including points of inflection picked from depth profiles of the HRSC borings. Cross Sections A – A' and B – B' were cut from the geologic model (see **Figures 4-1** and **4-2**). The geologic model's estimation of unit thicknesses and orientations interpolated from the picks was used to support the discussion of conditions under the UDEX release and along its perimeter. Geologic unit abbreviations shown on the cross sections are included in the discussion below. Note that boring and well locations near the section lines were projected onto the sections and as such may not perfectly align with the geologic unit contacts shown.

4.1.1 Anthropogenic Fill

Anthropogenic or urban fill (UF) is present beneath the existing land surface at most UDEX release locations and has been identified to range in thickness from a thin veneer to a maximum of approximately 10 feet. Fill has generally been placed in most significance along the Schuylkill River bank, west of River Road, and under former tank containment berms (see **Figures 4-1** and **4-2**). Borehole logs for wells and soil borings indicate that the fill is heterogeneous in nature and is composed of an admixture of sand and gravel, mud, and anthropogenic debris including crushed stone, asphalt, concrete, bricks, construction materials, glass, and shells. In the area of the UDEX release, the UF is mostly unsaturated and occurs above the regional water-table surface. In some places, however, the fill can occasionally be saturated and support perching of infiltrating stormwater. West of the UDEX release, in the former Schuylkill River floodplain, the UF is saturated creating a mounded water-table aquifer which plays an important role in the area's groundwater flow pattern (see **Section 4.2.3**).

4.1.2 Recent (Holocene) Alluvium

Recent alluvial deposits of Holocene age (Qh) are present in the UDEX release area as fringing Schuylkill River lowlands underneath areas of fill, below the Pleistocene terrace. These sediments, representing Holocene fluvial/estuarine depositional environments of the Schuylkill River and tidal portions of its tributaries, are spatially constrained to elevations near and below present sea level. **Figures 4-1** and **4-2** exemplify this relationship, with Qh deposits up to 20 feet thick (e.g., near C-129D) nearest the river and fringing the southern UDEX release area. The Qh deposits are mostly brown to grayish brown to dark gray clay/silt with varying amounts of fine sand and organic material (roots and leaves). Because they occur below sea level, the Qh deposits are generally wet to saturated and comprise part of the water table (e.g., near S-430 on Cross Section A – A'). Where overlain by fill, the Qh deposits can support groundwater perching.

4.1.3 Pleistocene Alluvium

Pleistocene alluvium (Qcm) is present beneath most of the UDEX release area and ranges in thickness from less than one foot to approximately 30 feet. It is generally thickest beneath the highest land surface elevations and becomes truncated along the Schuylkill River and under former lowlands. Its upper surface reflects the antecedent topography that preceded industrialization of the area. Overall, the Qcm is second only to the middle sand unit in terms of thickness and extent in the UDEX release area.

In large part, the Pleistocene alluvium occurs as a mappable sequence that is capped by a fine-grained, brown to brownish gray silt/clay with occasional lenses of sand and gravel that commonly grades with depth to sand and gravel. The fine-grained facies is commonly mottled from the slow percolation of recharge from ground surface and generally is present above the seasonal high water table (i.e., does not support local artesian water-table conditions). Below the muds, the Pleistocene alluvium is chiefly reddish brown, poorly-sorted gravelly sand, but includes secondary lithologies of silty, sandy, multicolored gravel and clay/silt in lenses. It is a heterogeneous unit that is reflective of its textural immaturity and fluvial depositional environments. In this area, the water table occurs most often in the Pleistocene alluvium (see **Figures 4-1** and **4-2** that include slices of April 2021 groundwater surfaces).

4.1.4 Upper Clay Unit

The PRM upper clay unit (Kuc) is interpreted to pinch out beneath the UDEX release area and where present was mapped as the first occurrence of reddish yellow, brown, and brownish yellow clay/silt (commonly sandy and laminated in color) beneath the Pleistocene alluvium. The upper clay was distinguished from the underlying middle and/or lower clay units where possible by stratigraphic position, color, consistency, and overall lithologic character. Where interpreted to be present, the upper clay generally ranges in thickness from less than one foot to approximately 6 feet. The unit thins and pinches out to the north, south, and east, and is completely missing to the west where removed by Schuylkill River incision.

In the context of hydrostratigraphy, the upper clay unit is interpreted to be a part of the water-table aquifer and where present, function as an aquitard limiting groundwater exchange between the Pleistocene alluvium and upper sand unit. Note that in places, the upper clay is mapped to be in direct connection with the middle clay where the upper sand is absent.

4.1.5 Upper Sand Unit

The PRM upper sand unit (Kus) is interpreted to be present beneath most of the UDEX release at thicknesses ranging from approximately 1 to 30 feet. The upper sand unit appears to be thickest to the south and thinnest along a southwest to northeast oriented trough, where it completely pinches out near borehole UVHP-07 (see **Figure 4-1**). Like the Pleistocene alluvium and upper clay, the upper sand is absent under the Schuylkill River and comprises the lower portion of its cut bank in the area. The upper sand unit is generally light gray to pale yellow, fine to medium-grained quartz sand with some silt and clay but distinctly different from the heterogeneous Pleistocene alluvium above it and can easily be distinguished where the upper clay is missing. Muddy lenses are common to the upper sand unit where it is well-sorted, very-fine to fine sand. Under average head conditions, the water table occurs above the upper sand unit, and it forms the lower part of the water-table aquifer.

4.1.6 Middle Clay Unit

The PRM middle clay unit (Kmc) is mapped as a nearly flat-lying but discontinuous deposit of predominantly medium to high plasticity, dark gray and reddish-brown clay/silt beneath the UDEX release area at thicknesses ranging from less than one foot to a maximum of approximately 10 feet. It is generally most thin central to the study area, where the Leapfrog modeling software predicts small breaks may exist (e.g., **Figure 4-1** to the south and east of S-507). The middle clay unit generally represents an aquitard that separates the regions two mappable hydrostratigraphic units (i.e., the water-table and lower aquifers) beneath the facility and its surrounding areas. However, in the UDEX study area, the middle clay is less significant in the overall Coastal Plain sequence and evidenced to support local groundwater leakage and possible direct exchanges between the aquifers. Hydraulic heads between the aquifers (discussed further in **Section 4.2.5**) are near equal and support local vertical communication.

4.1.7 Middle Sand Unit

The PRM middle sand unit (Kms) has been mapped in the UDEX release area to be a continuous, somewhat uniform sand body deposited atop the lower sand and/or lower clay, where present, primarily based on lithologic changes and stratigraphic position. Its thickness ranges from approximately 11 to as much as 50 feet, making it the thickest Coastal Plain deposit. It is predicted by the Leapfrog modeling software to be the deposit that is present under the Schuylkill River, beneath any riverbed sediments particularly in areas of scour. This mapping is consistent with Stantec (2025) where the updated middle sand interpretation recognizes it as a discrete, fining upward sequence separated from the lower sand in places by the lower clay marker bed (often lignitic or containing layers of peat). The middle sand is generally a red to brown and reddish yellow, occasionally muddy, gravelly, and stratified sand that often terminates in a gravel lag deposit. The middle sand unit is interpreted to form most of the lower aquifer hydrostratigraphic unit in the UDEX release study area.

4.1.8 Lower Clay Unit

The PRM lower clay unit (Klc) is of minimal importance in the UDEX release area. It is absent at most locations and has a maximum estimated thickness of approximately 0.5 feet. Absence of the lower clay leaves the middle and lower sands directly connected.

4.1.9 Lower Sand Unit

Like the middle sand unit, the PRM lower sand unit (Kls) is mapped as a nearly continuous unit beneath the UDEX release area. However, it pinches out to the north and west near the Schuylkill River and generally remains below approximately elevation -60 feet NAVD88. Where present, lower sand thicknesses range from approximately 1 to 20 feet. In general, the lower sand is thickest where underlying bedrock is deeper forming valley-filled troughs to the south and east of this area. The lower sand typically coarsens with depth, from a dense fine to medium pale gray, pale yellow, and white (commonly muddy) quartz sand to white and varicolored sandy gravel and gravelly sand. Gravels have been observed to be heterogeneous in places forming a lag deposit atop weathered bedrock. Scattered lenses of clayey sand and gravel within the overall sequence are common. The lower sand comprises the bottom portion of the lower aquifer hydrostratigraphic unit in the UDEX release area.

4.1.10 Crystalline Bedrock

Bedrock has been observed beneath the study area and, where encountered, has been described as moderately to highly-weathered mica schist. Where highly-weathered, the saprolite is generally a sandy, micaceous clay/silt that contains a visible rock fabric. As evidenced by the cross sections (see **Figures 4-1** and **4-2**), the top of bedrock surface beneath the UDEX release is nearly flat and dips subtly to the east, spanning an elevation range from approximately -60 feet to -70 feet below NAVD 88. The bedrock surface (including saprolite) is interpreted by Stantec to function as an aquitard representing the base of the lower aquifer.

4.2 Hydrostratigraphy

Stantec (2025) established two aquifers (hydrostratigraphic units) as mappable water-bearing units beneath the former Philadelphia Refinery facility. In general, these are the water-table (unconfined) and lower (semi-confined) aquifers (**Table 2-1**). The water table aquifer is generally considered to be that part of the saturated zone that is above the middle clay unit, and the lower aquifer is that portion of the saturated zone that is below the middle clay and above bedrock. Stantec assigned hydrostratigraphic units to UDEX release wells while developing and updating the regional CSM used in this RIR. **Tables 3-1a** and **3-2** contain the pertinent well construction and well gauging data utilized in this RIR and include the hydrostratigraphic unit assignments. **Appendix D** includes the well and boring logs used to support the hydrostratigraphy presented in this RIR.

4.2.1 Methodology for Evaluation of Groundwater Conditions

A significant number of wells have been installed and monitored in the UDEX release area since the first of the HRSC field programs was performed in late 2018. To evaluate site-specific groundwater conditions pertinent to the UDEX release, Stantec compiled, reviewed, and interpreted several gauging datasets from the many routine UDEX O&M events. The objective was to expand on the interpretive work performed by Stantec (2025) to characterize facility-wide groundwater conditions in support of using Evergreen's GWF model for the UDEX release fate and transport assessment. Depth-to-water measurements were collected by Stantec with an oil/water interface probe and reported to the nearest hundredth of a foot. Water-table elevations were calculated using surveyed well top-of-casing elevations and, where warranted due to LNAPL accumulations, corrected using appropriate LNAPL density data from BDH's sample set. In total, just under 5,000 well gauging records were compiled for the assessment (see **Table 3-2**). Well hydrographs are included in **Appendix I**, and **Figure 4-6** displays hydrographs from data loggers deployed in UDEX release area wells dating back to July 2018.

Golden Software's Surfer® 27 (2024) was used to interpolate the well gauging data using point Kriging to generate surfaces for the evaluation of the groundwater flow system. Grid residuals, the calculated difference between the observed and interpolated (gridded) values for the wells used in this RIR, were evaluated as a quantitative measure of how well the data is represented by the surface models. The Surfer estimations were deemed to be acceptable representations of the groundwater system if the mean residuals were smaller than what could be accurately measured in the field, generally less than one hundredth of a foot.

The interpolated groundwater surfaces were subsequently contoured and imported into a geographic information system (GIS) where color-floods were applied to visually evaluate flow patterns. **Figures 4-3a** through **4-4b** show color-flooded groundwater elevation surfaces estimated for both aquifers derived from the analysis of the near synoptic gauging events conducted in April 2021 (also displayed on the cross sections), March 2022 (water table only), April 2023 (water table only), and July 2023. In addition, **Figure 4-4b** includes selected, collocated July 2023 water-table wells to support the discussion of hydraulic head potentials between aquifers. Note that well S-507 was destroyed by redevelopment truck traffic soon after it was installed and sampled. Around the same time, Evergreen was abandoning wells ahead of redevelopment including the lower aquifer wells used to support this RIR. As such, the July 2023

gauging/sampling was the only synoptic event performed for all three UDEX lower aquifer wells to expand on Evergreen's findings regarding lower aquifer flow in the area.

4.2.2 Methodology for Evaluation of Aquifer Hydraulic Properties

Section 2 and **Appendix T** of this RIR document previous efforts by Stantec (2025) to compile as much information on the hydraulic properties of the regional aquifer system as was feasible for the documentation of Evergreen's former refinery-wide GWF model. While relevant to regional conditions, none of those data were collected in proximity to the UDEX release. As described in **Section 3.3.9**, during February 2019 and April 2020, Stantec performed slug tests on a selection of wells to establish estimates for site-specific, water-table hydraulic conductivity. Solid slugs were used to initiate instantaneous displacements in wells S-283, S-382, and S-433 through S-436 which are screened across the water table. Results of the slug test analysis are presented on **Figure 4-5**, and the slug test data analyses are presented in **Appendix V**.

To further the assessment of hydraulic conductivity, Stantec evaluated estimates collected from hydraulic profiling during the 2018 MiHpt survey (see **Figure 4-5**). The average hydraulic conductivity was calculated for the water table saturated thickness and interpolated by Kriging using Golden Software's Surfer® 27 (2024). The resultant grid was color flooded and presented on the figure to add context to the overall range of hydraulic conductivity values characteristic of the Pleistocene and to a lesser degree, upper sand deposits.

4.2.3 Unconfined (Water-Table) Aquifer Conditions

Beneath the UDEX release, the water-table aquifer is primarily composed of saturated and permeable portions of Pleistocene alluvium and to a lesser extent, the PRM upper sand unit. The water-table aquifer also includes the intervening and locally discontinuous PRM upper clay unit. On average, the saturated thickness of the water-table aquifer is approximately 15 to 20 feet.

Hydraulic properties of the geologic units and formations comprising the regional water-table aquifer were discussed in **Section 2.2.1** and describe a wide range of estimated values of hydraulic conductivity. At the UDEX release, results from slug testing indicate a similar finding in that hydraulic conductivity in the heterogeneous deposits may range from 1.7 to 70.7 ft/day, like the average values calculated from hydraulic profiling (20 to 60 ft/day) (see **Figure 4-5**). Outside of heterogeneity, other factors suspected of influencing the lower k results include insufficient well development, presence of separate-phase residual hydrocarbons near the water table (smear zone), and possibly iron deposits/other precipitates due to bioactivity at the site.

4.2.3.1 Groundwater Flow in the Water-Table Aquifer

1. Patterns of water-table aquifer groundwater flow appear relatively consistent through time suggesting that annual variability is minimal. Similar patterns are observed in the earlier datasets collected back through 2018.

2. Seasonal variability in water-table aquifer elevations was evaluated through hydrograph review of well gauging data (**Table 3-3**; **Appendix J**). Hydrograph data demonstrate that seasonal variability in the UDEX release water table is generally between one and three feet and that many wells experience similar magnitude changes, indicating that hydraulic gradients are reasonably consistent. **Figure 4-6** hydrograph records from data logging further this finding, as the water table wells are illustrated to mirror one another and respond primarily to rainfall and to a lesser extent, river tides.

3. A complex groundwater flow pattern exists in the UDEX release area. The mechanisms driving the pattern of water-table flow include topography, river tides, bulkheads, perched groundwater areas to the west, and likely interactions with deeper water-bearing layers. To the north, the water table surface generally mirrors the historical topography whereby there is an overall southerly flow from areas of higher topography. West of Schuylkill Avenue (River Road), groundwater perching in areas of fill behind the river bulkhead causes a small increase in hydraulic heads in neighboring wells screened along the edge of the Pleistocene terrace (see **Figure 4-3a** through **Figure 4-3c**). Just north of well S-430, there is a small area of open river bank where groundwater is inferred to seep into the Schuylkill River. Central to the UDEX release, most notably at well S-439, water-table groundwater elevations are anomalously low and create a convergent flow pattern. The most plausible explanation for this condition is interaction with deeper water-bearing strata through leakage and interconnectedness because the PRM aquitards are locally thin and sandy. Unlike other areas of the facility where large, partially submerged sewers leak and drain the water table, causing convergence, there are no known utilities of that magnitude and design in this area.

4. Hydraulic gradients in the UDEX release water-table aquifer are variable due to the complexities of the flow pattern and the mechanisms driving it. The steepest gradients exist in areas of convergence (approximately 0.007 ft/ft). Elsewhere, gradients are reflective of generally flat water-table conditions on the order of a few ten thousandths of a foot per foot.

5. The UDEX release remediation program included total fluids recovery via pumping of monitoring wells through the period of monitoring. However, minimal influence on flow patterns is expected to have resulted from these activities as the pumps were generally set to recover/skim LNAPL and not exert hydraulic control over groundwater contamination.

4.2.4 Lower (Semi-Confined) Aquifer Conditions

Beneath the facility area, the lower aquifer is mapped to include the PRM middle sand unit, lower clay unit, and lower sand unit. On average, the saturated thickness of the lower aquifer beneath the UDEX release ranges from approximately 40 to 50 feet. Regional hydraulic properties of the geologic units and formations comprising the lower aquifer were discussed in **Section 2.2.1** and, like the water table, describe a wide range of estimated values of hydraulic conductivity reflective of several potential factors. Slug tests were not performed on UDEX release lower aquifer wells. However, hydraulic profiling incorporated into the HRSC field programs indicates that the middle sand has similar but slightly higher hydraulic conductivities when compared to the water table (e.g., CD-02A OiHpt log in **Appendix O** shows middle sand hydraulic conductivity estimated between approximately 50 to 150 ft/day). Factors suspected

of influencing hydraulic conductivity variability include heterogeneity of the middle and lower sands, insufficient well development and possibly fouling of the tested wells in the time since installation.

4.2.4.1 Groundwater Flow in the Lower Aquifer

Figures 4-4a and **4-4b** display the study area lower aquifer elevation for two example gauging datasets, with the latter representing the only event when UDEX lower aquifer wells S-507 through S-509 were gauged together. The following key features are noted beneath the UDEX release area:

1. The lower aquifer groundwater flow direction is primarily south/southwest. Hydraulic gradients are consistent with other facility areas and are generally on the order of 10^{-3} to 10^{-4} ft/ft in the lower aquifer beneath the UDEX release.

2. When viewed in conjunction with former Philadelphia Refinery-facility wide datasets presented in Stantec (2025), the more regional pattern suggests that City of Philadelphia pumping at Mingo Creek Flood Control Basin (Mingo Basin) may be driving the lower aquifer flow direction, as the UDEX release occurs on the fringes of the basin's capture zone. The Schuylkill River tides have been demonstrated to influence lower aquifer water levels as well. Cross section interpolations support that the middle sand unit intersects the river, and the data logger hydrograph for C-129D contains a river tide signal of over 1 foot, an order of magnitude more than in the water table.

3. Seasonal variability in lower aquifer elevations was evaluated through hydrograph review of well gauging data from available records (**Table 3-3**; **Appendix G**). Like the water table, hydrograph data demonstrates that seasonal variability in the lower aquifer is generally less than 2 feet and that the wells experience similar magnitude changes, indicating that hydraulic gradients are reasonably consistent.

4. The lower aquifer has artesian conditions beneath the area and is semi-confined where the middle clay unit is effective at separating the lower aquifer from the water table. Because the middle clay is thin and sandy in the area, there is likely to be communication between the aquifers through leakage. However, the volume of groundwater moving vertically is expected to be minimal when compared to horizontal flow. No mounds or disruptions to the fairly uniform lower aquifer flow field have been observed which supports this conclusion.

4.2.5 Head Potentials Between Aquifers

Stantec evaluated the magnitude of vertical hydraulic head potentials between aquifers for the July 2023 gauging event by identifying locations of appropriately located well pairs. **Figure 4-4b** displays the results of that evaluation. The figure indicates that hydraulic head potentials between observed aquifers were positive (downward) at all locations, supporting a small downward vertical gradient of approximately 0.01 ft/ft. In addition, hydrographs in **Appendix G** for collocated wells S-484 and S-508 generally mirror one another for the period of monitoring, indicating that they are both responding to the same stimuli, primarily precipitation. These data support the conclusion that there is vertical communication between the aquifers in this area.

5 LNAPL Characterization

In the time since the UDEX release was discovered in 2018, many field investigations were performed with the primary objective of characterizing the nature and extent of the LNAPL released underground, and to begin remediation as quickly as possible. While remediation will be the focus of the UDEX release Cleanup Plan (CUP), the following sections summarize the activities and findings related to LNAPL delineation. Because the UDEX release characterization began soon after its discovery and line repair, the released LNAPL body was actively evolving underground in its early stages. Although some field efforts to characterize LNAPL mobility and recoverability were performed (e.g., baildown testing with vacuum truck extraction), it was obvious from the conditions that the UDEX release was pore scale mobile, highly recoverable, and capable of migrating at the time. A summary of the key findings of this section is included in **Section 6.4**.

5.1 UDEX Release Chemistry

When the UDEX release was discovered, PES informed Stantec that the UDEX feed line was used by the former refinery to primarily convey catalytic reformed light naphtha (reformate) from an UDEX unit in the former Girard Point Refinery to tankage in Point Breeze, where it was used for gasoline blending. PES provided Stantec with an SDS for reformate (**Appendix C**) indicating that the refinery intermediate was 100% volatile and included the primary constituents benzene and toluene. Stantec provided LNAPL samples bailed from monitoring wells S-283, S-382, and S-414 to the refinery's laboratory who confirmed that the LNAPL was reformate, and that the benzene content of the samples was just over 30 percent. The samples were noted to be visibly different from each other, however, including color variation from clear to black. Because there were legacy Sunoco LNAPL releases in the area, this result was not unexpected. To further the LNAPL assessment for Evergreen, Stantec contracted Torkelson Geochemistry to provide a basic interpretation of the same samples (whole oil analysis) which indicated that the LNAPL collected from wells S-382 and S-414 was a light petroleum distillate of unknown weathering degree, and the LNAPL collected from well S-283 was chemically similar to the samples collected from wells S-382 and S-414, but also contained a relatively smaller amount of extremely weathered middle distillate petroleum. Additional details of the LNAPL chemistry from forensic investigation are discussed in **Section 5.7** below.

5.2 MiHpt Survey and Soil Gas Screening

Shortly after the UDEX release was discovered through Evergreen's monitoring well network, Stantec, on behalf of PESRM, commissioned a passive soil gas screening and survey with the combination MiHpt probe to efficiently inform delineation of the UDEX release LNAPL body beyond the extent inferred from the Evergreen monitoring wells containing the LNAPL at the time, which were wells S-283, S-382, and S-414 (see **Sections 3.3.1** and **3.3.2**). Findings of the two technologies are included in **Appendix L** and **Appendix K**. Although the MIP does not directly detect presence or absence of LNAPL, the likelihood of LNAPL could be inferred from the relative response of the sensor across the area combined with the soil gas and well gauging observations at the time. The MIP profiles for locations MiHpt-01, MiHpt-03, MiHpt-

04, MiHpt-07, MiHpt-09, and MiHpt-12 exhibited much lower responses on the photoionization detector (PID) channel where VOCs would be detected when compared to the more central borings. The soil gas concentrations of benzene and toluene lent support for the interpretation that the UDEX release was primarily constrained spatially to the area south and east of the UDEX feed line, where the LNAPL was identified in the wells. The soil gas screening also provided support for the presence of a heavier diesel range component which would agree with the darker color mixed into some of the samples.

5.3 UVOST® Surveys

Although the initial characterization tools provided an overview of the spatial extent of the UDEX release based primarily on leveraging its volatility, more detail was deemed necessary to refine the nature and extent of the LNAPL body, particularly in its vertical distribution. Moreover, because the UDEX release was commingled with older LNAPL, a HRSC tool capable of informing LNAPL chemistry was warranted. A UVOST® survey was performed initially in May 2019 at 15 locations and expanded upon in July 2022, adding 9 additional locations, to comprise the LIF dataset (see **Section 3.3.3**).

Through the course of the project, Stantec worked closely with Dakota Technologies through advanced waveform analysis to identify LNAPL end members. To help establish the fluorescence basis, Stantec provided the Dakota UVOST® technician with field LNAPL samples from skimming system holding tanks and wells so that a range of characteristic waveforms (fingerprint) could be observed for the reformate and compared to a 2018 sample sent to Dakota's laboratory. After the 2019 field program, Stantec sent additional LNAPL samples to Dakota for emulation testing. Dakota performed nitrogen purging of the samples to remove oxygen and create a more representative waveform of fluorescence intensity and duration (lifetime) for each sample. These characteristic waveforms would be used to compare to the boring depth profiles and prepare for an advanced waveform analysis. Through Dakota's Non-Negative Least Squares (NNLS) process, the dominant waveform in each of the borings could then be estimated in the fluorescence profiles.

Based on review of the UVOST® depth profiles, fluorescence indicative of LNAPL was observed to encompass a smear zone enveloping the water table of approximately 0.5 feet (UVHP-04) to as much as 7 feet (UVHP-09). At most of the boring locations, particularly beneath areas of higher topography, a significant portion of the observed LNAPL smear zone was distributed beneath the HPT predicted water-table potentiometric surface, and fluorescence was biased towards the more permeable deposits/layers.

In general, the waveforms observed from fluorescence in most borings matched the reformate waveform derived from both laboratory and field emulation testing. This is referred to as NAPL R (in 2022 called REF) in the Dakota reports. In exception, borings located on the eastern perimeter of the UVOST® investigation area (e.g., UVHP-09 and UVHP-15) indicated that up to two additional LNAPL types may be present based on the characteristic waveforms observed. Based on a library set of waveform information collected by Dakota over approximately 25 years, the waveforms observed were indicative of a kerosene/jet fuel type (NAPL B; in 2022 called light naphtha range or LNR) and middle distillate petroleum such as diesel (NAPL D). An additional, bio-fermented version of reformate called FERM was also identified in 2022.

In 2019, the advanced waveform analysis performed by Dakota separated the composite fluorescence depth profiles into waveform components of NAPLs R, B, and D. Results of the advanced analysis indicated that borings UVHP-09, UVHP-10, UVHP-13, and UVHP-15 are diagnostic of the presence of a comingled kerosene/jet fuel and diesel LNAPL body with a relatively smaller amount of reformate (see Figure 1; **Appendix W**). The vertical distribution of LNAPL and relative intensity of fluorescence (there is a semi-quantitative relationship between increasing LNAPL pore saturation and increased fluorescence) suggests that the source area for NAPL B and NAPL D may be to the north and east side of the overall LNAPL body. The majority of reformate LNAPL was observed at borings UVHP-01 through UVHP-08 and UVHP-11. Borings UVHP-12 and UVHP-14 appear to have a relatively equal composition of all three LNAPL types in the general direction of southerly LNAPL migration.

The July 2022 UVOST® screening provided updated views of the original 15 boring locations while also expanding to key delineation locations, with additional LIF data to inform the LNAPL mixtures present to the east. The work scope provided access to a natural gas metering station that was previously unavailable. Boring UVHP-16 provided the end member, blue-shifted LNR waveform that was previously recognized as NAPL B and provided important delineation on reformate. Combined with UVHP-17, which indicated no fluorescence above background, the northern extent of reformate was established and used to redraw the UDEX release LNAPL body (see lower panels of **Figure 5-1**). Other key findings from the second screening event included delineation south of well BF-103R, where reformate LNAPL was observed to be migrating in 2019, with borings UVHP-23 and UVHP-24. This new information was used to extend the LNAPL body further south and east (see **Figure 5-1**).

5.4 Monitoring Well Gauging

The HRSC investigation methods allowed for the targeting of well installations that could be used for monitoring apparent LNAPL thickness (ANT) as an added line of information for demonstrating delineation for the remedial investigation. In total, 19 water-table monitoring wells were installed for the project and used in conjunction with existing Evergreen wells to monitor ANT. These data have also been used to track remedial progress, which will be further documented in the CUP. **Figure 5-1** and hydrographs in **Appendix G** provide views of maximum LNAPL thickness across the UDEX release LNAPL body over time. Through 2020, delineation by way of ANT measurements was achieved through monitoring wells S-411, S-429, S-435, S-433, and additional Evergreen wells outside of the views including C-129 to the west along the river bulkhead, S-412 and S-383 to the southeast, and S-413 to the east (see **Figure 1-2** for the location of these wells). Delineation to the northwest required use of the Schuylkill River bulkhead and bank near wells S-430 and S-431, where up until 2021 there was measurable LNAPL. No LNAPL has been observations in wells S-430 and S-431 after July 13, 2021, and November 24, 2021, respectively (see **Table 3-2**). Note that these riverbank wells were gauged and bailed routinely as a part of LNAPL recovery efforts, and the monitoring included visual checks of the Schuylkill River for sheening during which no sheens were confirmed to be sourced from UDEX release LNAPL discharges.

5.5 Remedial Design Characterization

A remedial design characterization (RDC) was completed in late 2021 to update and refine the existing UDEX release conceptual site model (CSM) to better inform design of a full-scale SVE system through optimized extraction well placement. To complete this objective, the RDC tools would have to further delineate UDEX release LNAPL and provide lines of data supporting the suitability of subsurface deposits in the vadose zone for vapor extraction. Previous HRSC investigations summarized in **Section 3.3** and in this section formed the basis for understanding of the nature and extent of the UDEX release LNAPL body and design of a SVE pilot test. However, a RDC was warranted at this stage of the project to develop an updated LNAPL footprint, increase the resolution of the permeability dataset, and evaluate temporal changes in the LNAPL body related to interim remediation, observed bioactivity, and inferred pore scale mobility. The LNAPL footprint will be the focus of this section.

In early November 2021, Aestus, working under the field oversight of Stantec, completed a GeoTrax Survey™ through acquisition of 14 ERI profiles (see **Section 3.3.4** and **Figure 1-2a**) later followed by a CD program including 24 targeted, direct-push borings and three deep rotosonic borings to bedrock. Key findings of the integrated ERI and CD datasets related to LNAPL characterization are presented by Aestus in **Appendix H** and can be summarized as follows:

- The subsurface depositional framework includes heterogeneities that likely played a role as preferential flow pathways for UDEX LNAPL migration up until the time of its stabilization.
- The UDEX release LNAPL body was visible in the ERI dataset within a resistivity range typical of unweathered LNAPL (generally > 250 ohm-meters) and this line of geophysical evidence supported delineation of the bulk of the release. The integrated ERI dataset also supported the presence of Pre-Existing Contamination (LNAPL) primarily to the east of the UDEX release, with a commingled zone in between the two through which the UDEX release LNAPL body was delineated (see **Appendix H**, Slide 24).
- Fluorescence indicative of the presence of petroleum in the subsurface was observed in all borings performed where not inhibited by shallow refusal. However, the degree to which fluorescence was observed varied and was relatively minimal in borings CD-11A, CD-02A, and CD-12B. The most significant fluorescence and thickest smear zone was generally observed in borings located in the central and northeastern portions of the LNAPL body.
- There are zones of low permeability present in the vadose zone and across the water table indicated by the direct injection logging of the HPT that correlate to the referenced locations where fuel fluorescence was observed to be minimal in this RDC and previous datasets. These data support the CSM interpretation that the UDEX release LNAPL preferentially migrated around these zones of low permeability historically.
- Where permeability is low, both the EC tool and soil confirmation cores from this and previous drilling phases support that the stratum is a highly weathered alluvial deposit consisting of varicolored, poorly graded, silty gravel to gravel deposit (mostly mudstone) that has been

correlated to Pleistocene-age alluvium. Deposits of mud are present but less common in the depth range of interest for the LNAPL characterization.

- Soil TPH data indicated that a reasonable range of LNAPL saturations characteristic of 2022 conditions ranged from less than 1% to more than 30%. Most hydrocarbon mass fell within the gasoline range; however, to the east and northeast the diesel range was present in increasing proportionality. The increasing diesel range in the eastern portion of the LNAPL body supports previous environmental forensics, UVOST®, and ERI findings in that there is significant middle distillate fuel present in this area from historic releases, which are Pre-Existing Contamination being addressed by Evergreen.

Multiple lines of evidence converged to support that the UDEX release LNAPL body from 2019 required updating in the 2021-2022 timeframe. The updated LNAPL body presented on the lower panels of **Figures 5-1** contained internal areas where LNAPL saturations were reportedly insignificant and may have resulted from preferential migration of UDEX release LNAPL around the areas of little to no permeability across the water table. ANT trends from gauging supported that LNAPL saturations near the northwestern perimeter had decreased through the period of record up until 2021, when LNAPL was no longer observed in wells S-430 and S-431. As such, the LNAPL body footprint was reduced in this area. The LNAPL body was extended farther east and south, a revision supported by well S-480 and well S-483 findings where the ERI profiles identified geophysical anomalies that appear to correlate to the core of a middle distillate plume (well S-480) and the southern extent of migration of the UDEX release (well S-483).

5.6 LNAPL Volume Estimate

Through the course of the UDEX release project, Stantec used the American Petroleum Institute (API) LNAPL Distribution and Recoverability (LDRM) model as a tool to approximate the LNAPL total and recoverable volumes to inform remedial goals. Initially, the UDEX release LNAPL body delineated from the first phases of characterization (upper panels of **Figure 5-1**) was estimated at 200,000 to 400,000 gallons. Expansion of the CSM dataset by way of the RDC warranted an update of the assessment. The total LNAPL volume is estimated in the model as an equilibrium profile of LNAPL saturation from a combination of site-specific and published values for LNAPL properties, soil properties, and field observations of ANT. Recoverable volume in the context of this project is the portion of the total LNAPL that is perceived as recoverable and is based primarily on the model input parameter of residual saturation (the amount of LNAPL left behind). Because reformate LNAPL is entirely volatile, it has been assumed for this exercise to have a residual saturation of 1%. This makes the estimate of recoverable LNAPL conservative as 99% of the total LNAPL is made available for remediation. It is also considered to be conservative because other LNAPLs present in the comingled body (light naphtha range and middle distillate fuel) are included in the estimate.

Figure 4 (see **Appendix X**) displays the updated LNAPL body that was zoned into six areas, five of which were independently carried through the LDRM model with area-specific inputs of ANT based on January 2022 gauging data and LNAPL density from previous lab analyses. Area 6, discussed further below, used the same LDRM inputs as Area 2. The resulting LNAPL equilibrium profiles of saturation for the areas

were exported from the LDRM, plotted, and the LDRM input parameters refined to best fit the saturations calculated from soil TPH data and the fluorescence profiles obtained from selected OIP borings (see **Appendix X** plots). Based on the results, it was conservatively estimated that the remaining UDEX release LNAPL body recoverable volume was 210,000 gallons.

Note that a proportionately significant LNAPL component from historic Sunoco releases (i.e., Pre-Existing Contamination as defined in the Buyer-Seller Agreement) was included in this volume estimate. Multiple lines of evidence support that the bulk of the legacy LNAPL is constrained spatially to the eastern perimeter and central portion of the LNAPL body where it is present as a mixture with the UDEX release. These findings were the primary drivers for a forensic investigation of the LNAPL types to develop, to the extent practical, a more precise understanding of their proportionality throughout the UDEX release area.

5.7 LNAPL Forensic Investigation

As described above and in **Section 3.3.5**, a forensic-level investigation of LNAPL was warranted by early 2022 after multiple lines of characterization data supported the presence of older LNAPL(s) mingling with the reformate. The objectives of the investigation were to sufficiently delineate the UDEX release by fingerprinting the LNAPL types and establishing their proportionality across a range of samples. Under this approach, the greater body of the UDEX release LNAPL could be targeted for remediation but also delineated to the extent practical for the purposes of this remedial investigation. ChemQuants worked through three addendums to the UDEX report (see **Appendix E**) as additional samples were collected to arrive at a total of 8 samples. A three-part LNAPL mixture was identified and in agreement with the UVOST® findings based on earlier LIF: a VOC range refinery intermediate feedstock enriched in benzene and toluene (reformate), a heavily altered light naphtha range petroleum that was possibly a light jet fuel, and a severely altered middle distillate fuel. One sample contained a very small amount of residual petroleum. In all samples where compositional analysis was possible and except for S-480, the reformate was the dominant LNAPL type representing anywhere from approximately 85 to 98 percent of each sample. The S-480 sample was mostly the light naphtha range petroleum with near equal parts reformate and middle distillate fuel. As such, this line of forensic characterization added to the data lines supporting delineation of the eastern side of the UDEX release because of the larger proportions of legacy, pre-existing LNAPLs there. The rest of the delineated LNAPL body was mostly reformate. The legacy LNAPLs are Pre-Existing Contamination being addressed by Evergreen under a separate Act 2 program.

6 Vapor Intrusion Assessment

There are currently no receptors for vapor intrusion into indoor air as there are no buildings in the vicinity of the UDEX release. In the future, vapor intrusion into indoor air will be addressed via engineering controls, or by way of risk assessment, for all new buildings/structures constructed onsite in accordance with the Soil Management Plan (SMP) attached to the first amendment to the CO&A:

“HRP [BDH] will install vapor barriers or other vapor mitigation controls (such as subslab venting systems) as part of constructing any buildings or structures at the Site, or, alternatively, will conduct sampling and analysis to demonstrate that such controls are not needed to mitigate potential vapor intrusion into such

buildings or structures in accordance with PADEP [Land Recycling Program Technical Guidance Manual, Section IV: Vapor Intrusion (VI Guidance)] guidance."

In addition to the engineering controls required by the SMP, administrative controls such as the development and implementation of a health and safety plan "*to protect employees, on-site workers, and other persons visiting the Property (including, but not limited to, construction workers) from any contaminants they might encounter on the Property*" will address the exposure pathway to ambient air.

Preferential pathways may serve as conduits for the migration of VOCs; however, no preferential pathways, such as sewers, are in proximity to the UDEX release area. A more comprehensive evaluation and discussion of preferential pathways will be addressed in the forthcoming Cleanup Plan.

7 Conceptual Site Model

7.1 Description and Site Use

The facility is located in south Philadelphia (**Figure 1-1**). The portion of the facility on the east side of the Schuylkill River is currently being redeveloped. The UDEX release is located within the redevelopment area in AOI 3 of the facility, a subsection of what was formerly known as the Point Breeze Refinery. Past use of the UDEX release area included a truck maintenance shop, security gate, warehouse, parking lot, and tank farm (former Tank Farm No. 5).

7.2 Site Conditions

Details of the UDEX release regional setting, geology, and hydrogeologic conditions are discussed in **Section 2** and **Section 4** of this RIR. The purpose of this section is to summarize key conditions describing the CSM and informing the UDEX release characterization.

7.2.1 Environmental Setting

- The facility occurs within the up-dip limits of the Atlantic Coastal Plain, generally within one mile of the "Fall Line". The Atlantic Coastal Plain is characterized by relatively flat topography and is underlain by a characteristic wedge of unconsolidated sediments that thickens in a southeasterly direction, away from the Appalachian Mountains.

- The UDEX release is located on the southern perimeter of a topographic high (fluvial terrace) with land surface elevations up to approximately 23 feet NAVD 88. To the north, south, and east the terrace was dissected by a series of historic streams that drained the landscape into the Schuylkill and Delaware Rivers (see **Appendix T** Figure 2-1 and Figure 2-2).

- Areas surrounding and including the UDEX release have a long history of human disturbance, including hardening of the Schuylkill River shoreline and placement of fill materials primarily in lowlands.

- Published information and regional mapping indicates that the Coastal Plain geology beneath the UDEX release area is complex and represented only by Cretaceous and Quaternary deposits, separated by a regional disconformity. Total Coastal Plain thickness above bedrock (predominantly variably weathered mica schist) is approximately 70 to 90 feet (see **Appendix T** Figure 2-3 and Figure 2-4).

7.2.2 Depositional Sequence and Lithologies

- Beneath the UDEX release and nearby areas, the following Coastal Plain deposits are present, in order of increasing depth/age: anthropogenic or urban fill (UF), Quaternary alluvium (including Holocene [Qh] and Pleistocene components [Qcm]), and the Cretaceous Potomac-Raritan-Magothy (PRM) aquifer system, including the upper clay (Kuc), upper sand (Kus), middle clay (Kmc), middle sand (Kms), lower clay (Klc), and lower sand (Kls) units (see **Figures 4-1** and **4-2**).

- Lithologies comprising the depositional sequence exhibit significant variability over short spatial and vertical distances, with the most significant variability present in the Qcm deposits. The Qcm deposits are mostly gravelly sands to sandy gravels but contain muddy lenses, and a characteristic muddy mantle nearer land surface. The Qcm deposits are one of the thickest and most consistent of the units present, with a distinct and visually identifiable lower contact with the underlying PRM sequence.

- The PRM “clay” units form the aquitards in the sequence and consist predominantly of low to high plasticity silty clay and clayey silt. However, in the UDEX area, the aquitards are thin and discontinuous, and there are facies changes with some silty fine sand and organic-rich laminations/lenses (particularly the Klc where present). Because of its significance in mapping across the facility area, the Kmc (less than one foot to approximately 10 feet thick locally) continues to maintain some hydraulic separation between water-bearing deposits above and below it. Although not directly observed in any UDEX borings, modeling software used to generate the UDEX release geologic model predicts two small local breaks in the Kmc.

- Highly to moderately weathered mica schist (bedrock) is present beneath the UDEX release at depths of approximately 70 to 90 feet.

- Two aquifers have been established from this sequence as mappable water-bearing units beneath the UDEX release and surrounding areas. In general, these are the water-table (unconfined) and lower (semi-confined) aquifers. The water table aquifer is generally considered to be that part of the saturated zone that is above the Kmc and the lower aquifer is that portion of the saturated zone that is below the Kmc and above saprolite/bedrock.

7.2.3 Water-Table (Unconfined) Aquifer

- Beneath the UDEX release, the water-table aquifer is primarily composed of saturated and permeable portions of Qcm and to a lesser extent, the Kus and Qh. The water-table aquifer also includes the intervening and locally discontinuous Kuc. On average, the saturated thickness of the water-table aquifer beneath the facility is approximately 15 to 20 feet.

- Slug testing and hydraulic profiling results indicate that hydraulic conductivities are spatially variable and range from approximately 1.7 to 70.7 ft/day, with the calculated average values from hydraulic profiling estimated at 20 to 60 ft/day (see **Figure 4-5** and **Appendix V**).

- A complex groundwater flow pattern exists in the UDEX release area. The mechanisms driving the pattern of water-table flow include topography, river tides, bulkheads, perched groundwater areas to the west, and likely interactions with deeper water-bearing layers. To the north, the water table surface generally mirrors the historical topography whereby there is an overall southerly flow from areas of higher topography. West of Schuylkill Avenue (River Road), groundwater perching in areas of fill behind the river bulkhead causes a small increase in hydraulic heads in neighboring wells screened along the edge of the Pleistocene terrace (see **Figure 4-3a** through **Figure 4-3c**). In between these features, there is a small area of open river bank (near well S-430) where groundwater is inferred to seep into the Schuylkill River. Central to the UDEX release, most notably at well S-439, water-table groundwater elevations are anomalously low and create a convergent flow pattern. The most plausible explanation for this condition is interaction with deeper water-bearing strata through leakage and interconnectedness because the PRM aquitards are locally thin and sandy. There are no known, large, or submerged utilities (e.g., sewers) in the convergence area that could drain the water table to the extent recognized.

- The groundwater flow pattern has been relatively consistent over time with minimal variability. Hydrograph data demonstrate that seasonal variability is on the order of 1 to 3 feet and that many wells experience similar magnitude changes, indicating that hydraulic gradients are reasonably consistent (see **Figure 4-6** and **Appendix G**).

- Hydraulic gradients in the UDEX release water-table aquifer are variable due to the complexities of the flow pattern and the mechanisms driving it. The steepest gradients exist in areas of convergence (approximately 0.007 ft/ft). Elsewhere, gradients are reflective of generally flat water-table conditions on the order of a few ten thousandths of a foot per foot.

- The UDEX release remediation program included total fluids recovery via pumping of monitoring wells through the period of monitoring. However, minimal influence on flow patterns is expected to have resulted from these activities as the pumps were generally set to recover/skim LNAPL and not exert hydraulic control over groundwater.

7.2.4 Lower (Semi-Confined) Aquifer

- Beneath the UDEX release area, the lower aquifer is mapped to include deposits of the Kms, Klc, and Kls with saturated thickness ranging from approximately 40 to 50 feet. It is mostly composed of the Kms with comparatively thin Klc and Kls units.

- Results from hydraulic profiling indicate that a reasonable range of hydraulic conductivities in the UDEX release lower aquifer Kms unit range from approximately 50 to 150 ft/day, like test results from the overall facility documented in Stantec (2025).

- The lower aquifer groundwater flow direction is primarily south/southwest. Hydraulic gradients are consistent with other facility areas and are generally on the order of 10^{-3} to 10^{-4} ft/ft. When viewed in conjunction with facility-wide datasets presented in Stantec (2025), the more regional pattern suggests that City of Philadelphia pumping at Mingo Basin may be driving the lower aquifer flow direction, as the UDEX release occurs on the fringes of the basin's capture zone. Schuylkill River tides have been demonstrated to influence lower aquifer water levels as well. Cross section interpolations support that the middle sand unit intersects the river, and the data logger hydrograph for C-129D contains a river tide signal of over 1 foot, an order of magnitude more than that of the water table.

- Seasonal variability in lower aquifer elevations was evaluated through hydrograph review of well gauging data from available records (**Table 3-3**; **Appendix G**). Like the water table, hydrograph

data demonstrates that seasonal variability in the lower aquifer is generally less than 2 feet and that the wells experience similar magnitude changes, indicating that hydraulic gradients are reasonably consistent.

- The lower aquifer has artesian conditions beneath the area and is semi-confined where the middle clay unit is effective at separating the lower aquifer from the water table. Because the middle clay is thin and sandy in the area, there is likely to be communication between the aquifers through leakage. However, the volume of groundwater moving vertically is expected to be minimal when compared to horizontal flows between aquifers. No mounds or disruptions to the fairly uniform lower aquifer flow field have been observed which supports this conclusion.

7.2.5 Head Potentials Between Aquifers

- Stantec evaluated the magnitude of vertical hydraulic head potentials between aquifers for the July 2023 gauging event by identifying locations of appropriately located well pairs. **Figure 4-4b** displays the results of that evaluation. The figure indicates that hydraulic head potentials between observed aquifers were positive (downward) at all locations, supporting a small downward vertical gradient of approximately 0.01 ft/ft. In addition, hydrographs in **Appendix G** for collocated wells S-484 and S-508 generally mirror one another for the period of monitoring, indicating that the wells are both responding to the same stimuli, primarily precipitation. These data support the conclusion that there is vertical communication between the aquifers in this area.

7.3 Constituents of Concern

7.3.1 Groundwater

- Since 2019, benzene was detected above the 5 ug/L SHS at 25 water-table aquifer monitoring wells, with exceeding concentrations ranging from 7 ug/L (S-411, February 2019) to 780,000 ug/L (S-484, July 2023). Benzene was detected above the SHS at two lower aquifer monitoring wells during the same period: S-284D (10 ug/L) and S-507 (16 ug/L). Note that there was benzene detected historically, prior to the UDEX release discovery, in Evergreen well S-284D and well S-69D, adjacent to S-507 (see **Figure 6-1** and **Figure 6-2**). These data over time support that the UDEX release is not a significant source of benzene to the lower aquifer.

- Since 2019, toluene was detected above the 1,000 ug/L SHS at 15 water-table aquifer monitoring wells, with exceeding concentrations ranging from 1,800 ug/L (S-430, July 2023) to 110,000 ug/L (S-482, September 2024). There were no SHS exceedances for toluene in any of the lower aquifer wells sampled between 2019 and April 2025 (see **Figure 6-1** and **Figure 6-2**).

- Benzene concentrations have been on a decreasing trend (see **Appendix J**) most notably at S-484 (from 780,000 ug/L in July 2023 to 200,000 ug/L in April 2025), S-382 (from 580,000 ug/L in February 2019 to 120,000 ug/L in April 2025), and S-431 (from 590,000 ug/L in February 2019 to 78 ug/L in September 2024). Much of this progress is attributable to ongoing remediation and NSZD.

- Toluene concentrations have been on a decreasing trend (see **Appendix J**) most notably at S-429 (from 44,000 ug/L in February 2019 to 14,000 ug/L in April 2025), S-430 (59,000 ug/L in February 2019 to ND in September 2024), S-431 (from 59,000 ug/L in February 2019 to 4.9 ug/L in September 2024), and S-382 (from 69,900 ug/L in February 2019 to 39,000 in April 2025). Much of this progress is attributable to ongoing remediation and NSZD.

- Other petroleum hydrocarbons and related COCs noted to exceed the SHS in groundwater on **Figure 6-1** and **Figure 6-2** are expected to be sourced from facility releases (i.e., Pre-Existing Contamination as defined in the Buyer-Seller Agreement) unrelated to the UDEX release and are shown for context.

A detailed discussion of COC distribution and trends is included in **Section 9.**

7.3.2 Soil

As the UDEX release originated from an underground line (the depth of the pipe was imaged with ground penetrating radar [GPR] at 4-5 feet bgs) and the impacts were therefore limited to subsurface soil, the soil investigation was primarily limited to an assessment of subsurface conditions. However, some surface soil collected by BDH in the UDEX release area for other purposes related to redevelopment was reviewed (see **Table 3-1a**). Subsurface soil samples collected during confirmation drilling and boring advancement/well installation (see **Section 3**) were selected at intervals where visual/PID impacts were observed during drilling activities, and well/boring locations were based on knowledge of historic use and on an intensive HRSC program used to identify drilling targets where impacts were most likely to be present, as previously described in **Section 3**. Soil sample locations and results compared to MSCs are depicted on **Figure 3-1a**. Concentrations of target COCs benzene and toluene were observed in excess of the selected MSCs at five locations, with one exceedance of the subsurface soil NRDC value at S-429 (1,300 mg/kg benzene). Note that this sample was collected in September 2018 at the capillary fringe for the purpose of calibrating the MIP response. This exceedance, as well as the other exceedances of the subsurface soil to groundwater benzene and toluene standards, are horizontally delineated by the perimeter samples without exceedances and vertically delineated in the subsurface through characterization of the LNAPL smear zone/delineation of the UDEX release LNAPL body. Surface soil exceedances of benzene indicated in a few of the samples (302-AM01-c and 302-AN01-c) are expected to have resulted from surface spills unrelated to the UDEX release.

A comparison of soil results to EPA RSLs is additionally provided on **Figure 3-1b,** with results tabulated in **Table 3-8.** Laboratory analytical reports are included as **Appendix F. Section 6.5** summarizes an assessment of the potential pathways to subsurface soil exposure.

7.4 LNAPL Characterization

- Many rounds of HRSC investigations were performed for the UDEX release with the primary objective of characterizing the nature and extent of the LNAPL released underground and to quickly begin recovering it. Because the UDEX release characterization began soon after its discovery and repair of the underground line leak (the line was flushed, capped, and replaced), the released LNAPL body was interpreted to be actively evolving underground in its early stages. Although some field efforts to characterize LNAPL mobility and recoverability were performed (e.g., baildown testing with vacuum truck extraction), it was obvious from the conditions that the UDEX release was pore scale mobile, highly recoverable, and capable of migrating at the time. As such, the focus of the LNAPL CSM was characterization to inform development of remedial measures and a full-scale remediation system over time.

- Numerous LNAPL characterization samples collected from the UDEX release provided the basis for fingerprinting its unique chemistry and also for understanding and quantifying the presence of legacy, pre-existing LNAPLs in the subsurface from historic product releases with which the reformate was mixing (see **Appendix E**). The composition of LNAPL mixtures identified in the subsurface through sampling and LIF are as follows:

    - » Reformate (primary component)
    - » Light Naphtha Range Petroleum (possibly Jet Fuel) (secondary component)
    - » Middle Distillate Fuel (tertiary component)
    - » Residuum (a trace component in one sample)

- While the reformate could not be age constrained (to inform the timing of release versus release discovery), both the light naphtha range petroleum and middle distillate fuel were found to be heavily altered by biodegradation, with a timing of middle distillate release at approximately 16 to 40 years prior to sampling. Both Jet Fuel and middle distillate were stored by former Sunoco in Tank Farm No. 5, just north and east of the UDEX release, as a possible source area. Overall, the reformate was the primary component of all the samples except for S-480, where the apparent Jet Fuel component was most significant. The location of S-480 was targeted with ERI, where the resistivity data suggested an additional LNAPL source area was present and separate from the UDEX release LNAPL core. UVOST® provided an additional line of evidence in this area where UVHP-16 contained the blue-shifted waveform composite characteristic of light naphtha range petroleum (e.g., kerosine/jet fuel). This waveform was used in combination with the reformate waveform through advanced analysis (NNLS) to demonstrate that the dominant LNAPL on the eastern perimeter was the light naphtha range (see **Appendix M**).

- Delineation of the UDEX release LNAPL body was accomplished using multiple lines of evidence, including HRSC technologies using the MIP, UVOST®, OIP, and ERI combined with targeted well installations and the forensic sampling described above to separate the bulk of the UDEX release LNAPL body from legacy, commingling LNAPLs to the extent practical. The legacy LNAPLs are Pre-Existing Contamination being addressed by Evergreen under a separate Act 2 program and are located mostly to the east and northeast of the UDEX release. **Figure 5-1** displays the UDEX release LNAPL body as it was originally delineated in 2019 and estimated at approximately 300,000 square feet.

- The UDEX release delineation was refined through the additional characterizations and as the early-stage LNAPL body adjusted in the subsurface. The UDEX release was constrained vertically to a smear zone across the water table in the Pleistocene alluvium that was approximately 0.5 to 7 feet thick and thickest to the east where commingled with the legacy petroleum. Interestingly, the UVOST® LIF data indicated a two-layer smear zone in this eastern area, with the reformate below the light naphtha range petroleum, supporting that the reformate pushed east and around, possibly under, the low permeability zones (windows in the updated LNAPL body) and began to mix upward over time.

- The API LDRM was initially used to estimate a released/source volume of approximately 200,000 to 400,000 gallons. The LDRM was used again in January 2022 to estimate the amount of LNAPL remaining from the release at approximately 210,000 gallons. The updated estimate was derived using updated ANT values, subdividing the overall LNAPL body into zones with site-specific LNAPL fluid properties, and calibrating the LDRM LNAPL saturation curves to site data, including LNAPL saturation estimated from TPH sampling and LIF smear zone thickness (see **Appendix X**).

- The UDEX release migrated south over time and was observed to expand into wells BF-103R and S-483 while moving away from the Schuylkill River bulkhead through the course of the project. Another notable feature was the characterization of low permeability, weathered and muddy gravel zones with minimal to no LNAPL fluorescence supporting that most of the UDEX release migrated around, and possibly under, these features that intersect the water table (note that well S-484 contained measurable LNAPL into 2023). The northern and eastern edge of the LNAPL was delineated primarily with UVOST®, ERI, and petroleum forensics.

- Trends of reduced ANT and absence of ANT over time are observable in **Figure 5-1** and on hydrographs provided in **Appendix G**. Importantly, many wells that once contained a few feet of LNAPL no longer contain measurable LNAPL across a range of water-table conditions. These trends are attributed to remediation (and NSZD), which since 2018, has included total fluids recovery and design/operation of a full-scale SVE/AS system. At the time of this RIR, approximately 294,000 gallons of LNAPL have been recovered by the remediation program.

7.5 Potential Migration Pathways and Receptors

- The UDEX release area occupies an approximately 7-acre portion of the facility. Present access is restricted by fencing and security measures and bordered by the Schuylkill River (**Figure 1-2a**).

- BDH implements safety protocols that mitigate the potential for worker exposure to impacted soil, groundwater, and/or LNAPL through the direct contact pathway.

- Exceedances of the subsurface NRDC and soil to groundwater MSCs for benzene and toluene were noted in a portion of subsurface soil samples included in the RIR. There are no expected surface soil impacts from the UDEX release because the release occurred from a subsurface pipe located approximately 4 to 5 feet below grade.

- The subsurface soil NRDC and soil to groundwater exceedances are horizontally and vertically delineated, and future redevelopment plans for the area include asphalt parking, roadways, and a slab on grade building. There are currently no buildings above the UDEX release impacts. Prior to construction and occupancy, on-facility buildings will be subject to vapor intrusion investigation and evaluation to determine if conditions (i.e., volatilization of COCs from soil, groundwater, and/or LNAPL) could pose an unacceptable risk to occupants. Vapor intrusion mitigation systems (VMS) will be incorporated into the design and construction of such buildings where potentially unacceptable vapor intrusion risks are identified. Note that SVE/AS remediation since 2021 has likely reduced the subsurface soil impacts significantly.

- Other potential vapor receptors such as large subsurface utilities were not identified within the horizontal or vertical proximity distances specified in the VI Guidance that warrant further vapor intrusion evaluation.

- The Schuylkill River is a potential offsite receptor of the UDEX release. The river was routinely checked for sheens during O&M activities that included bailing LNAPL from wells S-430 and S-431 up until the time when LNAPL was no longer observed in the wells. River sheens were not reported that could be directly sourced to the UDEX release. The fate and transport assessment presented in this RIR evaluates dissolved benzene and toluene mass discharges to the river via the groundwater to surface water pathway and includes an analysis of surface water mixing to demonstrate compliance with applicable surface water standards.

- A well search of PaGWIS records for the UDEX release encompassing a 1.25-mile buffer area was performed by Stantec in June 2025 (see **Appendix U**). Most identified well records are for monitoring or recovery wells at the former Philadelphia Refinery, or monitoring, remediation, and dewatering wells installed by others for nearby facilities (some with record of previous abandonment). Stantec reviewed the PaGWIS results, accessed via the PaGEODE platform, and found that no potable water supply wells were identified. This well search documented similar findings to those performed previously by Stantec for Evergreen at the former Philadelphia Refinery.

- Groundwater is not used for municipal or nearby communal, potable water supply in south Philadelphia.

- The PRM aquifer system is used for water supply in New Jersey. The aquifers of that system, chiefly the lower sand unit, can receive recharge via vertical leakage through confining units and direct recharge from younger deposits along their subcrop area in south Philadelphia, which includes the UDEX release. Groundwater COCs present and predicted via modeling to enter the lower aquifer are delineated to the characterized onsite area, far from the nearest water supply wells in New Jersey. Moreover, data provided to Evergreen by the New Jersey State Geologist supports that the Delaware River acts as a boundary condition, thereby mitigating the potential migration of groundwater and contaminants from the south Philadelphia area to New Jersey supply wells.

- Consistent with ecological evaluations for the former Philadelphia Refinery, a PNDI search and species information request indicated that the endangered species Atlantic Sturgeon, Shortnose Sturgeon, and threatened species Northern Red-bellied Cooter are known to exist in the vicinity of the UDEX release in Schuylkill River habitats. The fate and transport assessment in this RIR evaluates the surface water pathway and demonstrates that the predicted COC concentrations in surface water are below the applicable ecological screening criteria.

8 Quality Assurance/Quality Control

The following sections describe specific aspects of quality assurance/quality control procedures that pertain to the activities outlined in this report.

8.1 Equipment Decontamination

All sampling equipment was either dedicated or decontaminated in accordance with the field sampling procedures to prevent cross-contamination. Prior to sampling, the equipment was decontaminated with successive rinses of detergent, potable water, and distilled water.

8.2 Equipment Calibration

Air quality monitors used for both air monitoring and soil screening were calibrated prior to use. Both a zero calibration and a span calibration using gases of known concentration as recommended by the manufacturer (i.e. 100 parts per million by volume (ppm_v) isobutylene for the photoionization sensor) were performed. Groundwater sampling equipment (i.e., water quality sonde) was also calibrated prior to sampling.

8.3 Sample Preservation

Samples were placed directly into chemically preserved and/or non-preserved glassware provided by the analytical laboratory, as appropriate. Groundwater and soil samples were preserved and shipped at a temperature of approximately 4° Celsius (C) or less by application of ice prior to shipment to the analytical laboratory. This temperature was maintained during shipment by placing ice in zip-top bags above, around, and below the sample containers.

8.4 Field QC Samples

Field quality control (QC) samples for the UDEX release project included the use of trip blank samples to monitor cross contamination of water samples by VOCs during sample transport. The standard practice was to include one trip blank with every shipment of samples to the analytical laboratory.

8.5 Documentation

Chain-of-custody (COC) forms were maintained throughout the sampling program to document sample acquisition, possession, and analysis. Chain-of-custody documentation accompanied all samples from the field to the laboratory. Each sample was assigned a unique identifier that was recorded in the field notes as well as on the chain-of-custody document.

8.6 Data Review

Soil and groundwater analytical data is maintained in an Environmental Quality Information System (EQuIS) database managed by Terraphase Engineering (Terraphase). As part of the quality assurance/quality control (QA/QC) process, Terraphase performs and track checks on the laboratory logins, field-related information, and the electronic data deliverables (EDDs) received from the laboratory and documents this process in a Quality Control Checklist Table for each sample delivery group (SDG).

After each field event and following receipt of the laboratory login, Terraphase documents that the lab login, keyfile, COC, and field notes were reviewed for potential inconsistencies or errors. The keyfile is a table supplied by the field team after the sampling event and includes field-related information including, but not limited to, location code, sample name, sample date/time, matrix, sample collection interval, AOI, and sample method.

After receipt of the EDD, Terraphase completes another review that the sample names, sample dates, matrix, and analytes reported are correct and documents in the Quality Control Checklist Table. Qualified results are reviewed for any impact on the quality of the data. In EQuIS Professional, Terraphase addresses and resolves any issues in the EDD. If the laboratory has reported more than one value for an analyte (e.g., multiple dilutions), Terraphase reviews the laboratory narrative and sample specific QC results (e.g., surrogate recoveries). Following a specified QC methodology documented in the Quality Control Methodology Table (see attached), the higher quality analysis is retained. Any quality concerns or

multiple analyses and tracking, such as data receipt and incorporation into the database, are documented in the Quality Control Checklist Table.

9 Groundwater Fate and Transport Assessment

The groundwater fate and transport assessment completed for this RIR included the application of an existing numerical groundwater flow model (GWF Model) developed by Stantec (2025) for the facility on behalf of Evergreen. Prior to using the GWF Model as a tool to simulate the fate and transport of UDEX release COCs in groundwater, the numerical model performance was validated against site-specific UDEX release CSM data. The following sections document key components of the GWF Model validation, updates, and results.

9.1 Groundwater Flow and Contaminant Transport Model Objectives

The primary objective of the modeling activities is to aid in future demonstration of attainment of the Act 2 SSS for remediation liability of groundwater contamination at the facility on behalf of BDH. Attainment of this standard is predicated on the ability of the models to demonstrate that the extent of future contamination attributable to Post-September 2012 Contamination has been defined and contaminant transport pathways unique to the facility have been reasonably characterized so that human health and/or ecological risk posed by the current and future contamination extent can be appropriately evaluated through risk assessment. In accordance with Act 2 regulations, a fate and transport analysis is a required component of an RIR for this purpose.

To meet the objective, the RIR incorporates the GWF Model previously developed for the facility (Stantec, 2025) and, where available, includes site specific characterization data developed during the investigation of the UDEX release to meet the initial objective of simulating groundwater flow beneath the facility area. The GWF Model is coupled with a transport model to complete the fate and transport assessment through predictive simulations. The model development and approach was performed in general accordance with the American Society for Testing Materials (ASTM) Standard Guide for Application of a Numerical Groundwater Flow Model to a Site-Specific Problem (ASTM, 2017), PADEP's Land Recycling Program Technical Guidance Manual Section III.A.2 (Fate & Transport Analysis in the Saturated Zone) (PADEP, 2019), and to be consistent with overall project objectives under Pennsylvania Act 2.

9.2 Groundwater Flow Model

The GWF Model updated to support this study builds on an existing groundwater flow model developed by Stantec to meet the project objectives. The base model used to support this analysis is documented in the report *Volume 2: Fate and Transport Remedial Investigation Report, Revised, Former Philadelphia Refinery* and described in further detail below.

9.2.1 Previous Studies

The basis of the GWF Model is a conceptual understanding of the hydrogeologic and water balance components that control groundwater flow in the region. Groundwater flow models for the area have evolved through numerous studies. The following are the key hydrogeologic and groundwater modeling studies that support the evolution of the GWF Model that serves as a basis for the groundwater study:

- "Simulation of Ground-Water Flow in the Lower Sand Unit of the Potomac-Raritan-Magothy Aquifer System, Philadelphia, Pennsylvania" – Sloto (1988) developed a 2-dimensional, numerical groundwater flow model to evaluate the potential effects of groundwater withdrawal increases from the lower sand unit of the Potomac-Raritan-Magothy (PRM) aquifer system in Philadelphia.

- "Ground-Water Flow and Future Conditions in the Potomac-Raritan-Magothy Aquifer System, Camden Area, New Jersey" – Navoy and Carleton (1995) compiled a comprehensive hydrogeologic dataset for the Camden, New Jersey area and used that dataset to develop a 3-dimensional, finite-difference numerical MODFLOW model to simulate regional groundwater flow (including parts of southern Philadelphia) and evaluate the effects of future groundwater withdrawal scenarios on management of the PRM aquifer's resources.

- "Simulation of Ground-Water Flow in the Potomac-Raritan-Magothy Aquifer System Near the Defense Supply Center Philadelphia, and the Point Breeze Refinery, Southern Philadelphia County, Pennsylvania" – Schreffler (2001) constructed a 3-dimensional, finite-difference numerical MODFLOW model to simulate historical (1900-1995) groundwater flow conditions and water-levels in the PRM aquifer and used that model to evaluate the origins of a hydrocarbon plume near the former Philadelphia Refinery and former Defense Supply Center Philadelphia (DSCP).

- "Migration of Benzene and Simulated Groundwater Flow in the Potomac-Raritan-Magothy Aquifer System of South Philadelphia, Pennsylvania" – Sloto (2012) updated the 2001 Schreffler model in an administrative report for the USEPA to further study the potential source(s) and migration of benzene identified in the lower sand unit of the PRM near the former Philadelphia Refinery.

- "Volume 2: Fate and Transport Remedial Investigation Report, Revised, Former Philadelphia Refinery" – Stantec (2025) performed significant refinement of the Schreffler (2001) groundwater model. The goal of refining the USGS model was to utilize as much facility-specific and local hydrogeologic data as was feasible so that the numerical assessment would be most representative of the facility and local conditions. The GWF model was then calibrated to support evaluation of the future extent of groundwater contamination. In general, refinement of the USGS model included re-discretization of the finite-difference grid, updates to model layer thicknesses, refinement of hydraulic properties, boundary condition revisions, flow barrier modifications, and changes to the sources and sinks affecting the water budget. Detailed discussions of the site conceptual model, water balance, and groundwater model construction are documented in the report.

Detailed documentation of the model framework and construction is presented in the references described above. Refinements and updates of the GWF Model incorporated to support the UDEX study are described in **Section 9.2.2**.

9.2.2 GWF Model Update

UDEX release investigation results were used to validate the numerical groundwater flow model constructed to support a fate and transport evaluation of petroleum related constituents at the facility. The UDEX release location lies within the central portion of the former Philadelphia refinery footprint and by necessity was included in the development of the previous numerical model (Stantec, 2025). The GWF Model was validated for use in this study by simulating the observed groundwater elevation data collected during the UDEX investigation.

9.2.2.1 Selection of Validation Data

The validation targets consist primarily of observed groundwater head values (water levels). However, qualitative comparisons were also made against response to surface water tidal fluctuations, groundwater flow direction, and contaminant distribution. A discussion of the groundwater elevation data used for validation is presented in **Section 3.3.7** and supporting data is presented in **Table 9-1**.

Model validation was conducted using a small dataset including observations from UDEX release wells that were not available or used in the previous calibration datasets. Other wells used in the validation included key Evergreen wells monitored as part of the UDEX project. The GWF Model simulated results were compared to composite water level observation statistics in 26 wells using a total of 4,035 groundwater elevation measurements collected between 2000 and 2025. The objective of evaluating the suitability of calibration with historic data is to validate the assumption that the simulated groundwater heads are representative of the flow field for UDEX area specific datasets.

Figure 1-2a shows the locations of the selected validation wells (targets) in the GWF Model. For the calibration wells that span multiple layers, a comparison was made between the observed and the simulated water levels, and an appropriate layer was selected. **Table 9-1** presents a summary of the validation points.

9.2.2.2 Validation Criteria

During the validation process, the model simulation was compared to summary statistics of site-specific measured head values (water levels). The degree of agreement between the model simulation and the physical hydrogeological system data can then be compared to the simulations to evaluate the ability of the model to simulate the hydraulic conditions of the area of interest and to identify potentially beneficial directions for further calibration. Qualitative and quantitative comparisons are both essential in the calibration process (ASTM, 1993). Both were used to evaluate the degree of agreement between the GWF Model simulation and site-specific information.

The primary criterion for evaluating the quantitative calibration was the head residual. A residual or model error, e_i, is defined as the difference between an observed and simulated variable measured at a target location:

$$e_i = h_i - h'_i$$

where h_i is the measured value and h'_i is the simulated value at a specific target location. During the validation, and subsequent calibration, the measured value and h'_i , was defined as the average value between 2000 and 2025, and the 1st and 3rd quartiles were considered for context due to the relatively large short-term variation in groundwater elevation observed in wells located proximally to the Schuylkill River (**Appendix H**). Spatial or temporal correlation among residuals can indicate systematic trends or bias in the model. Correlations among the residuals may be evaluated through scattergrams or temporal and spatial plots.

Residual analysis is significant in evaluating the calibration. However, this does not imply that a groundwater system is properly represented by a model. If a conceptual model fails to reproduce the salient features of a system, the given calibrated model may not be able to match observed data as expected. Residual analysis can reveal potential trends in residuals, indicating a systematic error in a model or data, and can point out aspects in a model that need to be modified.

The calibration procedure seeks to minimize a function, the residual sum of squares (RSS):

$$RSS = \sum_{i=l}^{n} (h_i - h'_i)^2$$

where n is the total number of calibration targets. The RSS is the primary measure of model agreement. Second order statistics can be used to quantify the amount of spread (range of variability) of the residuals about the residual mean. One example is the residual standard deviation (RSTD), which normalizes the RSS by the number of calibration targets and number of estimated parameters (P), is defined as follows:

$$RSTD = \sqrt{\frac{\sum(x - x')^2}{n - 1}}$$

The RSTD is useful for comparing model calibrations with different numbers of calibration targets. Smaller values of standard deviation indicate better correlation between model simulations and observed field data. A large variance or standard deviation either indicates that the data were nosier than expected or that there is a trend in the residuals.

Another calibration measure is the mean of all residuals (*e*):

$$e = \frac{1}{n}\sum_{i=l}^{n} e_i$$

A mean residual significantly different from zero indicates model bias. A large positive or negative mean indicates that data are systematically under-predicted or over-predicted by a model. Calibration may be viewed as a regression analysis designed to bring the mean of the residual close to zero and to minimize the standard deviation of the residuals. Statistics on hydraulic head residuals aid in the evaluation of model calibration. The mean of the residuals is expected to be close to zero. The standard error in a regression is the square root of the calculated error variance.

9.2.2.3 Model Update

During the validation process the model simulation was compared to measured head. Qualitative and quantitative comparisons indicated that minor changes to the model domain were necessary in the UDEX release area to (1) be consistent with the information gained during the UDEX investigation and the updated CSM and (2) to improve the quantitative and qualitative calibration.

Findings from the HRSC investigations and model validation indicate that the Layer 1 alluvium is more transmissive than previously estimated in the baseline model. Additionally, the zonation of the lower hydraulic conductivity area representing the Holocene alluvium (muds) was slightly modified based on the additional data collected to support the UDEX investigation. **Figure 9-1** shows a comparison between the baseline model and the updated model.

9.2.2.4 Calibration Results

A qualitative evaluation of the calibration can be made by comparing the observed potentiometric surfaces for the study area with the simulated potentiometric surfaces in Layers 1, 3, 5, and 7 representing the primary water bearing units: water table (including the upper sand unit) and lower aquifer (comprised of the middle and lower sand units) (**Figures 9-2a** through **9-2d**). It is apparent from a comparison of the observed potentiometric surface maps and the GWF Model simulated potentiometric surface maps that the calibrated model is generally capturing the major features of the groundwater flow system. The elevation, shape, magnitude, gradient, and position of the potentiometric surface are accurately simulated by the calibrated model.

Figure 9-2a presents a low hydraulic gradient water table within the alluvial sand deposits that slopes to the northwest towards and ultimately discharging to the Schuylkill River and a mounded area within the Holocene muds**. Figures 9-2b** through **9-2d** indicate a regional gradient to the southwest, primarily a result of pumping simulated within the Mingo Basin.

Residual analysis was used to reveal potential trends in residuals, indicating a systematic error in the model or the data, and can point out aspects in a model that need to be modified. The calibration of the GWF Model sought to minimize the residuals and the relative error computed for the 26 groundwater elevation data points in the calibration dataset. Using the model residuals, a quantitative comparison of the model's fit to observed data may be made.

Figures 9-3a and **9-3b** present each validation well and the relative size of the residual by geographic location and layer. The residual distribution is near random; however, there are some minor spatial trends. For example, the monitoring wells within the Holocene muds are generally simulated higher than

the observed values. These areas are still considered to be calibrated and not anticipated to adversely affect the purpose and scope of the model simulation because the model substantially captures the gradient.

Figure 9-4 shows a graphical representation of the fit of simulated to observed data. Note that the observed head at monitoring well S-382 is well above the rest of the area and is considered to be an anomalous point, included for completeness. The calibration statistics indicate that the model accurately represents the measured potentiometric surface. Summary statistics for all layers indicate that the residual mean is -0.0007 feet which is close to zero, indicating that the GWF Model is not consistently over- or under-predicting the groundwater elevation. Residual standard deviation is 0.66 feet, and the range of observed heads is 3.89 feet, resulting in a scaled Root-Mean-Square Error (scaled RMSE) of 0.017%.

In a perfectly calibrated model, all the points would fall directly on the 1:1 ratio (match) line. A poorly calibrated model would show many points falling very far from the match line. Hence, **Figure 9-4** shows that the fit is good, with the larger part of points falling very close to the match line particularly when considering the variability in the data as represented by the error bars indicating the first and third quartiles of the observation data sets. Also, there is no significant bias as to whether the points fall above or below the match line. Given the absolute size of the model and range in heads across it, these values are considered to indicate appropriate calibration.

9.3 Surface Water Modeling Approach

The UDEX release occurred in proximity to the Schuylkill River, a tidal surface water body that receives diffuse groundwater discharges in the area (see **Section 4.2.3**). As such, the migration pathway from groundwater to surface water must be addressed under Act 2. The approach to understanding the magnitude of UDEX release impacts to the river and to demonstrate attainment of surface water quality criteria includes application of the PADEPs Toxics Management Spreadsheet (TMS) Version 1.4 (May 2023) to predict the contaminant mass flux and expected mixing/dilution along the transport pathway of the UDEX release groundwater plume (see **Section 9.6**). These values are then compared to the relevant surface water criteria deemed applicable to the assessment which include the Water Quality Criteria for Toxic Substances listed in Table 5 of Title 25 Pennsylvania Code Chapter 93 (Water Quality Standards) Section 93.8(c) (Human health and aquatic life criteria for toxic substances).

Per Title 25 Pennsylvania Code Section 93.9(e), the tidal Schuylkill River is not classified as a potable water source, and as such, the PA Code Chapter 93 Human Health Criteria for benzene and toluene in surface water are not applicable to the project objective. An alternate screening level criteria for benzene is used in the TMS assessment and will be discussed in detail in the UDEX release HHRA under separate cover, making use of the waiver provision in Title 25 Pennsylvania Code Section 250.406(c) (see **Section 12**). The criteria used for benzene is 90 parts per billion, adopted from the USEPA Ambient Water Quality Criteria (AWQC), and is a risk-based AWQC in surface water derived using both carcinogenic and non-carcinogenic endpoints. The human health AWQC for benzene in surface water based on non-carcinogenic effects and ingestion of organisms only is 90 ppb. Because the Chapter 93 Table 5 Human Health Criterion for toluene is comparatively high and the predicted mass flux for toluene

is comparatively low (see **Section 9.6.1.2**), an alternative criterion for toluene is not used in the assessment.

TMS results for benzene and toluene are included in **Appendix Q** and discussed in **Section 10**.

9.4 Fate and Transport of COCs in Groundwater

The COCs in groundwater at the UDEX release are sourced from LNAPL (reformate) that leaked from an underground line discovered in 2018 during routine Evergreen well gauging.

When released to the subsurface environment, depletion of the separate phase petroleum will occur naturally by a range of processes that include dissolution, vaporization, and biodegradation in the unsaturated and saturated zone. Collectively these processes result in mass transfer away from the petroleum release (ITRC, 2009; Johnson et al., 2006; Lundegard and Johnson, 2006). Once released to the subsurface, the petroleum may biodegrade into simpler carbon compounds, partition to the vapor phase, or dissolve into groundwater. At the UDEX release, the natural processes of source depletion have been enhanced through direct LNAPL recovery from wells, soil vapor extraction, and air sparging.

Each of these processes works to reduce the quantity of petroleum in the subsurface soil, separate phase, and groundwater. However, it is the process of dissolution that results in the presence of dissolved-phase constituents in groundwater.

Even though separate phase petroleum generally has a low solubility in water, when petroleum encounters groundwater, some constituent compounds will partition into the water. The lightest components (including benzene and toluene) are typically some of the more soluble components (along with certain additives) and among the most readily degraded and volatilized. Petroleum also contains medium weighted hydrocarbons called polycyclic aromatic hydrocarbons (PAHs). PAHs have moderate to very low solubility in water. Petroleum products may also contain heavy fractions that include waxes, asphaltenes, and nonpolar compounds which do not readily dissolve in water.

In terms of dissolved phase plume size and duration, the plume expansion period is short compared with the length of time most residual petroleum remains in the subsurface. Plume expansion continues until a relatively stable condition is reached, whereby the flux of dissolved components is balanced by the mass removed through attenuation processes in the aquifer. Numerous multi-site studies conducted since the 1990s have presented results that indicate dissolved-phase hydrocarbon plumes stabilize at relatively short distances from the source area and are unlikely to be greater than a few hundred feet in length (Newell and Connor, 1998; Connor et al., 2015; O'Reilly et al., 2021).

While dissolution of source mass fundamentally controls the duration of inputs to dissolved-phase plumes, the plume size and composition is predominantly controlled by groundwater flow velocity and natural attenuation in the aquifer. Natural attenuation includes the physical, chemical, and biologic processes that act without human intervention to reduce the mass, toxicity, mobility, and volume of COCs in soil and groundwater (USEPA, 1999b).

There has been substantial interest over the past three decades in natural attenuation as a management strategy for contaminated groundwater (API, 2004; ASTM, 1998; EA, 2000; Wiedemeier et al., 1996, 1997). This has provided a comprehensive body of evidence on the theoretical basis and practical site implementation of this approach for dissolved plumes originating from petroleum sources (Rivett and Thornton 2008; Wiedemeier et al. 1999). Natural attenuation takes place in the unsaturated zone, at the water table, and in groundwater, through the processes of biodegradation, dispersion, adsorption to soil particles, and volatilization. Whether in soil or groundwater, the processes involved in natural attenuation are the same, although the relative importance of individual processes could vary by location and constituent. Of these processes, biodegradation through metabolism by naturally occurring microorganisms is generally considered to be the primary mechanism responsible for petroleum mass reduction in the subsurface soil and groundwater (MPCA, 2005). Biodegradation will reduce constituents of petroleum releases into non-toxic metabolic byproducts, typically carbon dioxide and water (MPCA, 2005).

9.4.1 Benzene

Benzene in groundwater is a constituent of, and may be sourced from, releases of reformate and is often the main groundwater contaminant of concern at petroleum release sites because of its solubility, toxicity, and mobility (compared to other petroleum hydrocarbons).

In the saturated zone, individual dissolved-phase constituents enter the groundwater from LNAPL through the process of dissolution. Benzene is soluble with a reported solubility of 1,780.5 milligrams per liter (mg/L) (25 Pa. Code, Chapter 250, Appendix A, Table 5). Once dissolved in groundwater, benzene is transported primarily through advection (flow of groundwater), dispersion, and to a lesser degree chemical diffusion. While dissolution of source mass fundamentally controls the duration of inputs (from LNAPL) to dissolved-phase plumes, the plume size and composition is predominantly controlled by natural attenuation in the aquifer. It is also noted that benzene composition does not remain constant in the source LNAPL but rather is depleted over time through the process of NSZD.

Upon release to the subsurface, adsorption of benzene to soils is one of the most influential characteristics with respect to contaminant migration. Benzene adsorbs to soil organic matter which slows migration and results in groundwater transport at a rate approximately half as fast as advective groundwater flow (depending on organic carbon content in soils). The increased travel times, because of sorption processes, provides an increased opportunity for natural attenuation as it moves through the subsurface.

Biodegradation acts to limit the length of a dissolved-phase benzene plume in groundwater. Benzene has been reported to biodegrade under a wide range of aerobic and anaerobic geochemical conditions. Degradation rates are predominantly presented as first-order rate constants or half-lives, where rate of degradation is proportional to the contaminant concentration. Biodegradation in aerobic conditions is generally more rapid since contaminant breakdown using oxygen as an electron acceptor is the mechanism which yields most energy to the microbes. Reported aerobic degradation half-lives of benzene in groundwater are reported to range from approximately 58 to 693 days (USEPA, 1999a). However, utilization of oxygen by microbes during aerobic degradation may lead to significant depletion of

oxygen levels in groundwater which can cause conditions to become progressively more anaerobic. Consequently, the degradation rates may change by virtue of the reaction mechanisms involved. Anaerobic degradation of benzene generally occurs at slower rates than aerobic degradation. Anaerobic degradation half-lives in field studies are reported to range from 30 days to recalcitrant with a mean of 231 days (Suarez and Rifai, 1999).

Immediately following a release, the dissolved-phase benzene plume is anticipated to expand due to an imbalance in mass entering groundwater at the source and mass removed from groundwater via natural attenuation processes. Plume expansion typically continues until a relatively stationary condition is reached, whereby the flux of dissolved components is balanced by the mass removed through attenuation processes in the aquifer. Typically dissolved-phase benzene plumes stabilize at relatively short distances from the source area and are unlikely to be greater than a few hundred feet in length. For example, a review of over 600 studies of dissolved-phase hydrocarbon plumes throughout the United States (Newell and Connor, 1998) found that benzene rarely migrated more than 200 to 300 feet in groundwater. Similarly, Conner et al. (2015) compiled benzene (and MTBE) plume length and stability information from up to 13 published studies of multiple underground storage tank (UST) sites in the United States which indicated median benzene plume lengths of 101 to 185 feet, with 94% of the plumes in a stable (nonexpanding) condition. In addition, more than 91% of the monitoring wells reviewed in the study exhibited non-increasing benzene concentration trends.

9.4.2 Toluene

Toluene is a monoaromatic hydrocarbon commonly found in petroleum products and is frequently associated with releases from petroleum facilities. Like benzene, toluene is one of the more soluble and mobile components of LNAPLs, though it is generally less toxic and more readily biodegradable than benzene. Its relatively high solubility and moderate toxicity make it a significant contributor to dissolved-phase plumes at petroleum-contaminated sites.

In the saturated zone, dissolved-phase toluene enters groundwater through partitioning from LNAPL via the process of dissolution. Toluene has a reported aqueous solubility of approximately 515 mg/L (25 Pa. Code, Chapter 250, Appendix A, Table 5), which is lower than that of benzene but still significant enough to produce measurable concentrations in groundwater following a release. Once dissolved, toluene is transported by advection, dispersion, and diffusion. However, due to its more rapid biodegradation under a wider range of conditions, toluene plumes tend to be shorter and more attenuated compared to benzene.

Toluene also undergoes sorption to soil particles and organic matter, which affects its migration potential in the subsurface. The extent of adsorption depends on the organic carbon content of the soil and can retard the movement of toluene relative to groundwater velocity. The retardation factor for toluene is typically lower than that for benzene due to its higher sorption characteristics, resulting in slower transport through groundwater (USEPA, 1999b).

Biodegradation is a dominant natural attenuation process influencing the persistence of toluene in groundwater. Toluene is known to degrade readily under both aerobic and anaerobic conditions. Under

aerobic conditions, biodegradation is relatively rapid, with reported half-lives ranging from several days to a few weeks (Suarez and Rifai, 1999). Toluene also supports anaerobic degradation pathways, including nitrate-, sulfate-, and iron-reducing conditions, and even under methanogenic conditions, albeit at slower rates. Reported aerobic half-lives range from 10 hours to 43 days. Reported anaerobic half-lives vary considerably but are often shorter than those for benzene, with anaerobic degradation half-lives reported to range from 0.2 days to recalcitrant with a mean of 2.3 days (Suarez and Rifai, 1999).

Following an initial release, the dissolved-phase toluene plume may expand due to mass transfer from residual LNAPL to groundwater. However, due to its higher biodegradability and tendency for sorption, plume expansion is typically constrained, and the plumes tend to stabilize relatively quickly.

Overall, while toluene may be a significant dissolved-phase contaminant following a petroleum release, its greater biodegradability, stronger sorption potential, and typically shorter plume lengths suggest that natural attenuation processes are often effective in managing toluene in the subsurface environment.

9.5 Groundwater Fate and Transport Model Construction

The numerical simulations in this report utilized measured concentrations of indicator parameters in groundwater within the study area, a detailed understanding of groundwater flow, chemical and physical properties, and chemical fate and transport processes to evaluate current contaminant distribution and predict future contaminant distribution. Conservative assumptions were made to produce a model with an intentional bias designed to overpredict concentrations and plume length. The groundwater transport model is designed to inform risk assessment and conservatively predict long-term distribution of dissolved contaminants in groundwater. Uncertainty in the groundwater transport model was evaluated by varying transport parameters over a reasonable range to evaluate the potential range of outcomes and assess the potential impacts of uncertain parameterization.

The groundwater transport model has been developed in general accordance with Land Recycling Program Technical Guidance Manual, Section III – Technical and Procedural Guidance, Fate and Transport Analysis (PADEP, 2019) and American Society for Testing and Materials (ASTM) Standard D5547 – Guide for Application of a Numerical Groundwater Flow Model to a Site-Specific Problem (ASTM, 2017) and was designed to be consistent with the objectives outlined in this section.

The groundwater transport modeling approach was developed based upon the following key elements of the conceptual model:

- Three-dimensional groundwater flow in a heterogeneous subsurface environment
- Unconfined and semi-confined aquifer conditions
- Interaction between groundwater and surface water of the Schuylkill River
- Hardening to the shoreline of the Schuylkill River through installation of bulkheads and sheet piles that act as “partial” barriers to groundwater flow within the aquifer system

- A regional groundwater capture zone enveloping Mingo Basin, a City surge basin that is routinely pumped to significantly lower groundwater elevations
- The presence of multiple COCs of varying physical properties, degradation rates, and behavior in groundwater
- Sources of COCs that consist of trapped LNAPL and/or sorbed COC mass that degrade over time due to NSZD from biodegradation, dissolution, and volatilization
- Groundwater transport processes of advection, dispersion, retardation, and degradation

The groundwater transport modeling approach was to develop a steady state regional GWF Model and couple it with a site-scale transient groundwater transport model to evaluate potential migration of indicator constituents in groundwater. Although the area of concern is a relatively small portion of the GWF Model domain, an existing GWF Model that incorporated the large data was available and was selected to facilitate the evaluation of fate and transport.

To accomplish the approach outlined above, a steady state GWF Model constructed using the USGS three-dimensional finite-difference MODFLOW-USG computer code (Panday et al., 2013) was developed and calibrated using groundwater level measurements across the facility. The calibrated GWF Model was coupled to a groundwater transport model (USG-Transport) for simulation of advection, dispersion, retardation, and biodegradation of indicator constituents in the groundwater system (Panday, 2022). The groundwater transport model was designed to perform predictive simulations over a 30-year period (nominally 2025 to 2055).

9.5.1 Chemical Properties

Key physical and chemical characteristics that influence the occurrence, movement, and fate of the selected indicator parameters in the environment were previously discussed in **Section 9.4** and are summarized in **Table 9-2**.

The distribution of these parameters in the groundwater transport model is discussed below.

9.5.1.1 Organic Carbon Sorption Coefficient

Soil organic carbon sorption coefficient (k_{oc}) is a parameter used to estimate the mobility of an organic compound in soil. The partition coefficient describes the tendency for dissolved constituents to sorb to organic carbon within the aquifer. Larger values indicate greater sorption.

The organic carbon partition coefficient is used to calculate the solute adsorption (**Section 9.5.2.3**).

Linear adsorption k_{oc} values in the groundwater transport model were assigned based on the values reported in 25 Pa. Code, Chapter 250, Appendix A, Table 5, for benzene and toluene, respectively.

9.5.1.2 Degradation Rates

The degradation rate is the primary parameter which describes mass removal from the groundwater system and is considered a key parameter because it influences both the length of the plume and the longevity of the contaminants in the environment. The first-order decay rate represents the degradation of the contaminant as it moves through the aquifer with time. For organic compounds this rate is reflective of the microbial biodegradation rate of the constituent in the subsurface; for inorganic compounds this represents the attenuation capacity within the aquifer due to sorption, ion exchange, precipitation, and complexation that serve to reduce the concentration in groundwater.

Degradation rates assigned in the groundwater transport model for benzene and toluene were consistent with those reported in 25 Pa. Code, Chapter 250, Appendix A, Table 5. Uncertainty of degradation rates was further evaluated via the sensitivity analysis.

9.5.2 Aquifer Properties

9.5.2.1 Porosity

Effective porosity is the fractional volume of interconnected pores occupied by flowing groundwater. The effective porosity can be equal to but is generally less than the total porosity (Woessner and Poeter, 2020). Values for unconsolidated sediments can vary over a large range from 0.01 to 0.46. Primary (and secondary) porosity tend to be lower in the poorly sorted alluvial sediments and fill that dominate the upper portions of the aquifer. An effective porosity of 0.225 was assigned for all cells representing unconsolidated deposits.

While effective porosity is an important variable in estimating advective flow velocities it generally varies within a relatively small range in comparison to hydraulic conductivity and is therefore not considered to have relatively low sensitivity to transport results.

9.5.2.2 Dispersivity

Dispersion is the process of mechanical mixing of a solute in groundwater caused by heterogeneity of the aquifer and tortuosity of the flow path. Dispersion causes spreading of the solute longitudinally, transversely, and vertically.

As a general rule, values of dispersivity were based upon established relationships as a function of scale to the observed size of plume (Gelhar and Rehfeldt, 1992). In this method, dispersivity is estimated as a function of contaminant transport distance. The apparent longitudinal dispersivity is estimated to be one-tenth the plume length.

The benzene plume dimensions are estimated from studies of multiple plumes (n=165 sites for benzene) across the United States (Connor et al., 2015). Based upon the studies, a conservative 90th percentile of plume length, 425 feet for benzene, respectively, was used to derive longitudinal dispersivity values of 42.5 feet. While plume lengths for toluene are generally less than those associated with benzene, there is less aggregated quantitative plume data available specifically for toluene plumes in the literature

record. To be conservative, the dispersivity was held the same for the toluene as benzene for the transport simulations.

In areas of relatively lower permeability (fringing marsh and lowland deposits along the Schuylkill River) plume lengths are typically smaller because of lower hydraulic conductivity. In these areas the longitudinal dispersivity is estimated to be one twentieth the plume length. To address the lower hydraulic conductivity areas, two zones of dispersivity have been established: zone 2 represents the lower permeability marsh and lowland deposits and zone 1 represents the rest of the model area.

Following guidance in PADEP (2019), a transverse dispersivity is estimated to be one tenth the longitudinal dispersivity and vertical dispersivity is *de minimis* for all parameters to maintain conservative assumptions within the transport model. Transport parameters, including dispersivity, used in the solute transport simulation are summarized in **Table 9-2**.

9.5.2.3 Retardation

Dissolved constituents do not generally travel at the advective speed of the groundwater due to adsorption processes. Dissolved organics are adsorbed from solution onto the aquifer matrix, thus slowing the movement of contaminants. Adsorption tends to slow the transport velocity of constituents dissolved in groundwater. When the average velocity of a dissolved constituent is less than the seepage velocity, the constituent is impeded with respect to groundwater flow. In shallow alluvial and estuarian soils with a significant organic carbon component, sorption is expected to be strong and can be an important control on migration of organic compounds.

The coefficient of Retardation, R, is used to estimate the impeded constituent velocity. The coefficient of retardation is described by the following equation:

$$R = 1 + \frac{\rho_d K_d}{n_e}$$

where:

$$k_d = k_{oc} * f_{oc}$$

where:

ρ_d = bulk density of soil (kilograms/liter (kg/L)) = 1.75 kg/L

Bulk density values for fine, medium, and coarse-grained sand range from 1.37 to 1.81 kg/L (After Walton 1988; and Domenico and Schwartz 1990). A bulk density of 1.75 kg/L was used in estimating the coefficient of retardation for the facility. As indicated, bulk density varies within a small range in comparison to other parameters that can affect contaminant velocity, most notably organic carbon partitioning coefficient and hydraulic conductivity, and is not considered to be a sensitive parameter in the transport model.

k_{oc} = organic carbon distribution coefficient (L/kg)

benzene = 58 L/kg

toluene = 130 L/kg

See **Section 9.5.1.1** for discussion of sorption coefficients by constituent

f_{oc} = organic carbon content of soil (unitless) = 0.005 to 0.05

This is the weight fraction of organic carbon available for organic constituents to absorb in the aquifer soil matrix. Typical values are 0.0002–0.005 with an appropriate default value of 0.002 (PADEP, 2019). Given the facility setting in an alluvial and tidal marsh area, a relatively high f_{oc} sorption is expected. A fraction organic carbon value of 0.005 was used in estimating the coefficient of retardation for the alluvial deposits and fill, and a value of 0.05 was assigned to the Holocene-age marsh deposits. The uncertainty around fraction organic carbon was further evaluated during the sensitivity analysis.

n_e = effective porosity (unitless) = 0.225; see **Section 9.5.2.1**

Based on this information, the estimated retardation factors for the indicator parameters are:

R (benzene) = 1+((1.75 kg/L * 58 L/kg * 0.005) / 0.225) = 3.25

R (toluene) = 1+((1.75 kg/L * 130 L/kg * 0.005) / 0.225) = 6.06

Contaminant flow velocity is anticipated to span 4 orders of magnitude and would be estimated to be approximately 3.25 to 6.06 times slower than the advective groundwater flow velocity depending upon the sorption properties of the constituent of interest. Transport parameters, including organic carbon partitioning coefficient, used in the solute transport simulation are summarized in **Table 9-2**.

9.5.3 Initial Concentration

9.5.3.1 Data Selection Process

Stantec put forth a concerted effort to include as many sample points/wells as possible to establish the conservative initial conditions for the UDEX release fate and transport assessment. This included a combination of data from all BDH monitoring wells plus a selection of Evergreen wells either impacted by the UDEX release, or adjacent to the release with non-detect results for benzene and toluene, thereby informing its delineation. Based on the timing of UDEX release estimate and on the available groundwater sampling dataset, it was decided that the period for initial concentration data selection was best represented by selecting the maximum reported benzene and toluene concentrations from February 2019 – January 2025 with the following exception: any well with post-2024 analytical data availability would have the maximum COC concentrations selected from the period January 2024 – January 2025. Perimeter wells were included to avoid spatial bias and aid in the interpolation of complete benzene and

toluene groundwater plumes (**Section 9.5.3.4**). Overall, the approach allowed for consideration of new data (mostly reduced concentrations supported by groundwater trends in **Appendix J**).

The resulting maximum contaminant concentration datasets formed the basis for the initial concentration data for the unconfined and lower aquifers, summarized in **Table 9-3**. The table includes the sample dates for which the maximum concentrations were selected.

9.5.3.2 Non-Detect Value Concentration Assignments

Several well samples included in the initial concentration datasets have non-detect (ND) values for benzene and/or toluene selected for the groundwater transport simulations. In most cases, the UDEX release groundwater plume areas are more well defined by using the ND values to fill data gaps and reduce spatial bias. Based on a recommendation from the PADEP in response to Evergreen's fate and transport modeling at the facility, Stantec used the maximum laboratory RL values to estimate the contaminant concentrations for the ND values in the UDEX release initial concentration datasets. **Table 9-3** details the ND assignments where applicable.

9.5.3.3 Interpolation Methods

The resulting maximum concentration datasets for each of the indicator parameters were interpolated to estimate initial conditions grids intended to conservatively represent current conditions and form the basis for predictive simulations. Hydrostratigraphic unit assignments were used to separate the concentration data by water-bearing unit so that the groundwater plumes could be appropriately represented in the model. Like the method described in **Section 4.2.1**, Golden Software's Surfer® 27 (2024) was used to interpolate the concentration data using point Kriging with a linear variogram model developed to best fit the individual datasets. For each contaminant, two grids were developed (one grid for the water table and one grid for the PRM middle sand unit) and directly imported into the groundwater transport model into corresponding model layers 1 and 5 based upon the well screen elevations and CSM stratigraphy.

9.5.3.4 Groundwater Plume Descriptions

Initial concentrations in the transport modeling for benzene and toluene are presented in **Figures 9-5a and 9-5b**, respectively, as color-flooded grids representing the interpreted groundwater plume current conditions. Each figure includes four panels corresponding to the water-bearing units characterized in the CSM. Dissolved plumes are drawn, as applicable, in each of the water-bearing units assigned to GWF Model Layers 1, 3, 5, and 7. Groundwater MSCs are used for each compound to define the limits of the colored plumes.

The purpose of this section is to briefly describe the overall groundwater plume configurations that serve as the initial condition datasets for the groundwater transport modeling. In all, approximately 31 water-table wells and 7 lower aquifer wells are used to establish the initial concentrations. Note that for the lower aquifer, most wells with analytical detections are screened in the middle sand unit with some wells screened across and into upper portions of the lower sand unit.

9.5.3.4.1 Benzene

As described in **Section 9.4**, benzene has the highest solubility of the petroleum hydrocarbons selected for groundwater transport modeling and is the most prevalent UDEX release constituent of concern. Benzene also has a relatively low groundwater MSC (5 ug/L) when compared to other volatile organic compounds (VOCs) detected in UDEX release groundwater. For those reasons, benzene has a larger overall plume footprint than toluene in the water table relating to dissolution from the UDEX release LNAPL body.

The most elevated benzene "core" concentrations occur proximal to the pipeline release and the residual LNAPL plume. The benzene concentration in this area is high enough to support continued dissolution from LNAPL sources. Other, generally lower concentrations occur along the fringes of the plume core. The dissolved benzene plume in the lower aquifer is substantially more diffuse, with maximum concentrations several orders of magnitude lower than the water-table source areas. While it is possible that the lower aquifer benzene and toluene plumes were sourced from legacy, non-UDEX release LNAPL, they were retained for the modeling to be conservative and because the predictive simulations discussed in **Section 9.6** support some vertical migration in the area.

9.5.3.4.2 Toluene

Toluene distribution in groundwater generally mirrors that of benzene due to their similar physical and chemical properties. While toluene is less soluble than benzene, it remains one of the more soluble and mobile petroleum hydrocarbons. Toluene also has a higher groundwater MSC (1,000 µg/L) than benzene, which contributes to a smaller area of exceedance despite similar source conditions.

The overall toluene plume footprint is co-located with benzene, though more limited in spatial extent. Elevated toluene concentrations are primarily observed near the pipeline release area and the residual LNAPL zone, indicating ongoing dissolution from the LNAPL. Concentration declines from this core area, with lower levels observed at the plume margins.

In the lower aquifer, the dissolved toluene is not present at concentrations above the MSC.

9.5.4 Source Terms

Dissolved benzene and toluene are generally inferred to be sourced from the free phase UDEX release. The residual petroleum is anticipated to lose mass over time due to dissolution, volatilization, and biodegradation. Soluble components are transferred from the petroleum to groundwater infiltrating through the vadose zone or in the saturated zone and a dissolved-phase plume may develop. Dissolution rates and hence source zone longevity is influenced by a variety of factors including:

- Petroleum composition
- Distribution and saturation
- Petroleum-groundwater contact area

- Groundwater velocity
- Molecular diffusivity of the petroleum constituents in groundwater
- Non-equilibrium dissolution effects
- Enhanced dissolution due to biodegradation of dissolved components (Garg and Rixey, 1999)

The numerous factors influencing the longevity of remaining LNAPL source in the UDEX release subsurface lead to uncertainty in the application of source over time in the predictive simulations. However, legacy LNAPL is expected to degrade and lose its ability to sustain the groundwater plumes over time, through the NSZD process.

The benzene and toluene simulations presented in this RIR include an enhanced analysis of source through application of first order decay to simulate NSZD. The source terms applied in the model are shown on **Figures 9-6** and **9-10** as hatched symbolized polygons. As the figures indicate, the source areas were selected from the initial concentration grids to represent the groundwater plume cores where residual LNAPL is expected ("hot spots"). First-order decaying LNAPL sources with an estimated half-life of 7.3 years (Garg and Rixey, 1999) were applied to maximum groundwater concentrations for benzene and toluene greater than 100,000 ug/L and 10,000 ug/L, respectively. Additional benzene source scenarios are documented in the sensitivity analysis (see **Table 9-4** and **Appendix P**).

9.6 Predictive Simulations

Baseline predictive simulations were performed for benzene and toluene using the groundwater transport model parameters discussed in **Section 9.5** to evaluate the potential transport of contaminants.

The GWF Model provides the steady-state flow field in which the constituents move and allows for performing simulations under conditions reflective of the recent history and could be reasonably expected to occur in the future. On the scale of contaminant transport (decades), steady state groundwater flow processes are anticipated to be appropriate to support the objectives.

The groundwater transport model was simulated as a forward prediction for a 30-year period to evaluate the potential migration of the COCs in groundwater to illustrate solute transport mechanisms, in particular, solute transport direction, distance, concentration distribution, and mass flux.

9.6.1.1 Benzene

In general, over the simulated period of 30 years, dissolved benzene is predicted to generally decrease in concentration through natural attenuation as it moves via advection and longitudinal dispersion in the direction of groundwater flow. Plume length is controlled by groundwater velocity and source strength. Plume width is largely controlled by source width of the initial release and transverse dispersion. Simulated transport of the current distribution of dissolved benzene shows differential migration of benzene primarily controlled by soil type. Migration within low permeability sediments is retarded both by lower groundwater velocities and increased sorption properties.

Discrete areas of dissolved benzene have been identified within the facility. The source, origin, and extents are documented within this RIR. **Figure 9-6 through 9-9** present the simulated distribution of benzene in the water table, upper sand unit, lower aquifer middle sand unit, and lower aquifer lower sand unit for 30 years at 10-year increments. Of the two parameters, benzene is the only constituent predicted to reach below the water table zone. Mass is simulated to enter the dissolved phase through the simulation of sources intended to conservatively represent residual mass in LNAPL and mass back diffusing from fine grained sediments. Benzene source mass is degraded over time to represent NSZD of the residual benzene mass in LNAPL. Mass is simulated to leave the groundwater system through localized discharge to surface water and biodegradation. Historically, mass was also recovered through operation of remediation systems; however, current and historical systems were simulated to be off during the groundwater transport model simulation. Based upon the groundwater transport simulations benzene concentrations are simulated to gradually decrease over time through natural attenuation processes. **Figures 9-6, 9-7, 9-8, and 9-9** present the simulated maximum extent of groundwater above the MSC at ten-year intervals for the water table, upper sand unit, middle sand unit, and lower sand unit, respectively.

As indicated in **Figure 9-6**, the most prominent area of dissolved benzene is in the water-table unit. This area has been demonstrated to be influenced by the source originating from the pipeline. The simulation results indicate a brief period of plume expansion followed by stability and contraction over the simulation period. Over the entire simulation period concentrations are simulated to decrease. The dissolved benzene migration is largely contained by the low permeability Holocene mud deposits to the west and by the Schuylkill River and bulkheads to the northwest.

Figure 9-7 presents the simulated distribution of dissolved benzene in the upper sand unit. As evidenced by the distribution of dissolved-phase benzene, contaminants are simulated to move into the upper sand, generally in locations where the upper sand unit is in hydraulic connection with the overlying water table unit. The dissolved benzene plumes in the upper sand, where present, are more diffuse, with maximum concentrations generally one or two orders of magnitude lower than the water-table source areas.

Figure 9-8 presents the simulated distribution of dissolved benzene in the middle sand unit. As evidenced by the distribution of dissolved-phase benzene, contaminants are simulated to move into the deeper aquifer, generally in locations where the middle clay unit aquitard is thin and/or sandy, vertical gradients are down, and the lower aquifer sediments are in hydraulic connection with the overlying water bearing units. The dissolved benzene plume in the middle sand, where present, is more diffuse, with maximum concentrations generally two or three orders of magnitude lower than the water-table source areas.

Figure 9-9 shows that the model does not simulate dissolved benzene to migrate to the lower sand unit at concentrations exceeding the MSC.

9.6.1.2 Toluene

Figures 9-10, 9-11, 9-12, and 9-13 present the simulated distribution of toluene in the water table upper sand unit and lower aquifer middle sand unit for 30 years at 10-year increments. Note that toluene is not simulated to migrate beyond the water table at concentrations exceeding the MSC.

Toluene is not as widely distributed above the MSC in groundwater as benzene, in part due to the higher MSC value (1,000 ug/L). Over the simulated period of 30 years, dissolved toluene is predicted to generally decrease in area and concentration (except for assigned source zones). Toluene mass is simulated to enter the dissolved phase through the simulation of continuous sources intended to conservatively represent residual mass in LNAPL and mass back diffusing from fine grained sediments. Toluene is simulated to leave the groundwater system through biodegradation.

9.7 Uncertainty of Groundwater Fate and Transport Model Predictions

Transport model input parameters were selected to best reflect known site conditions based on available data, or in the absence of site-specific information or data, parameter values that are conservative with respect to contaminant migration. Nevertheless, the predictive ability of a model based on specific parameters is subject to uncertainties which stem from the inherent variability of geologic media, chemical properties, and transport processes.

Recognizing parameter uncertainties and their resultant uncertainties on model predictions, additional simulations were performed using adjusted input parameters to evaluate the sensitivity of these input parameters on transport model results. To address uncertainty in the model predictions, simulations were constructed using numerous parameter sets. Model simulations were then conducted using these parameter sets, and the results were compared to the baseline model simulation. The parameter sets account for variations in the sensitive transport parameters: biodegradation rate, adsorption, and dispersivity. They do not account for uncertainty in groundwater flow parameters because the groundwater flow model was calibrated by numerous groundwater elevation observation points and well constrained by subsurface borings at the facility.

In total, 9 parameter sets were developed for assessing the uncertainty in transport simulations. Model sensitivity analysis runs and parameter inputs for each COC are summarized in **Table 9-4.** A visual comparison of simulated results for benzene are included in **Appendix P**.

The results of the sensitivity simulations further establish the predictive ability of the model and identify the degree to which key input parameters affect the transport solution.

9.8 Groundwater Fate and Transport Model Limitations

A groundwater model is not an absolute representation of the complex heterogeneous flow and transport system of the aquifer. The simulated system represents a simplified version of the current conceptual model of a complex hydrogeologic system. Therefore, even though the groundwater transport model is considered reliable to meet the objectives of the study, prudence should be used in its application as a planning tool.

Some of the additional key limitations/assumptions and data gaps of the groundwater transport model are presented below:

- Because the groundwater transport model has a minimum horizontal grid size of 40 ft x 40 ft, it is not capable of reproducing groundwater levels or concentrations at a resolution less than this due to limitations imposed by the spatial resolution.
- The complex history of the facility has resulted in multiple releases of varying size, distribution, age, and chemistry. This hinders the ability to history match the groundwater transport model to groundwater concentration data. This limitation has been overcome, to some degree, through an emphasis on data collected during the site characterization phase of the investigation, selection of conservative assumptions, and uncertainty analysis.

If needed, the groundwater transport model could be utilized in the future to simulate the groundwater flow system, evaluate potential remedial actions, and evaluate fate and transport of COCs under future conditions.

10 Surface Water Modeling Results

Using the predictive simulation results presented in **Section 9.6** and under the approach discussed in **Section 9.3**, the maximum benzene and toluene groundwater concentrations resulting from the UDEX release numerical modeling are simulated to reach the river in year 28 at 3,288 ppb and 0.1 ppb, respectively. The total groundwater flux was calculated for TMS design flow input by summing the 19 GWF model river cells encompassing the predicted benzene plume front. This resulted in a total groundwater flux of 22.4 gallons per day from a plume front of approximately 850 feet in length. Other required TMS inputs included selection of reasonable values estimated for the groundwater seep and Schuylkill River stream characteristics (see **Appendix Q**).

Using the conservative inputs, the TMS predicted that for benzene, the Water Quality-Based Effluent Limit (WQBEL) governing the groundwater discharge could be as high as approximately 96,545,911 ppb to meet the adopted 90 ppb AWQC in the Schuylkill River surface water after mixing, which is the strictest of the applicable criteria. Similarly for toluene, the governing WQBEL is predicted to be well above the modeled maximum groundwater concentration reaching the river (92,943,096 ppb WQBEL versus 0.1 ppb maximum groundwater concentration) to meet the Chapter 93 Table 5 applicable criteria. As such, both compounds are interpreted to screen out under these scenarios of conservative modeling and indicate that additional surface water modeling is not required. The modeled COCs are supported to have concentration levels in surface water that are well below the ecological and human health screening criteria as indicated in the **Appendix Q** model results section (listed under Wasteload Allocations as Water Quality Criteria [WQC]).

11 Climate Resiliency

The fate and transport results presented in this RIR are based on numerical simulations that are calibrated to a set of parameters meant to conservatively represent current or “recent” conditions. These conditions may be subject to change over time, especially when considering that the timescales of the

predictions for contaminant transport and longevity of remaining legacy petroleum sources spans several decades. For this reason, an assessment of the resiliency of the model predictions to a changing environment is warranted. Although there is general consensus amongst the scientific community that the Earth's climate is changing and predicted to continue to change, uncertainties exist in the quantification of the magnitude of the changes to be expected and where to expect them. The objective of this RIR section is to qualitatively discuss some of the more commonly expected outcomes of climate change and how the simulations might be affected by those changes. The climate change topics sea-level rise, flooding, and drought are discussed below in the framework of BDH's fate and transport modeling, and expectations for the future of the property redevelopment, to the extent known. Note that this assessment parallels the climate resiliency presented in Stantec (2025) as the groundwater modeling approach was the same, and the remaining environmental impacts will be subjected to the same future conditions. Some updates related to the ongoing property redevelopment are discussed.

11.1 Sea-Level Rise Scenarios

The potential effects of climate change on future groundwater conditions were evaluated over an approximately 80-year period using estimates of projected sea level rise for the facility area. Sea level rise driven groundwater rise was assessed using near-term, mid-century, and end-of-century sea level rise predictions outlined in the Climate-Resilient Planning and Design Guidance for the Philadelphia Water Department's primary planning scenario from National Oceanic and Atmospheric Administration (NOAA) data (PWD, 2022).

Future conditions were assessed by assuming a linear response of groundwater to rising sea levels. Sea level rise of 1.18, 2.89, and 6.40 feet for the near term (2030s), mid-century (2060s), and end-of century (2100s) scenarios were considered, respectively. In flux-controlled groundwater systems where recharge remains consistent over time, a linear response of groundwater rise to sea level rise is assumed. This assumption is consistent with the approach used by other researchers in this area (Hummel et al., 2018) and is a reasonable assumption for the area of the UDEX release. Because groundwater gradient is not anticipated to change substantively, groundwater fluxes of contaminants are similarly assumed to remain consistent over time in the absence of substantial anthropogenic changes to the system.

Regarding anthropogenic changes to the system, significant land surface modifications have occurred in association with BDH's property redevelopment that warrant consideration. These include earthwork and regrading that have generally resulted in the overall raising of former floodplain areas. For the most part, the UDEX release area, including areas of predicted groundwater plume extents, will remain under higher topography that is not anticipated to be cut to an elevation that would allow for future inundation caused by rising sea level over the planning scenario timeframe of reference. According to a September 2024 Overall Site Master Plan for the Bellwether District, the lowest finished floor elevations for proposed buildings in the former lowlands along the Schuylkill River will be 15 feet NAVD 88, which is above the 500-year floodplain.

Additional correspondence with BDH indicates that the sitewide intent is to raise the buildings above the 500-year floodplain and parking areas above the 100-year floodplain. The magnitude of these changes is interpreted to mitigate the possibility of any future groundwater emergence, particularly at the UDEX

release. Moreover, the planned construction of large warehouses, paved parking areas, and lined stormwater ponds may minimize future groundwater recharge potential that could affect the amount of rise in the water table expected under sea-level rise scenarios. Of particular importance to the UDEX release assessment are the river bulkheads that function as horizontal flow barriers in the GWF model. Stability of the shoreline is critical to the successful redevelopment of The Bellwether District. As such, BDH plans to maintain a stable shoreline using bulkheads or alternate stabilization methods (e.g., riprap slope) in the future. If modifications to the shoreline stabilization methods are planned, consideration will be given to maintaining a low permeability boundary along the shoreline consistent with the modeled conditions.

11.2 Weather Extremes

According to the Intergovernmental Panel on Climate Change (IPCC), there have been widespread and rapid changes in Earth's systems driving weather and climate since at least the early 1970s likely from human-caused global warming (IPCC, 2023). Some of the observed changes include an increased frequency of weather extremes such as heavy precipitation events, droughts, and/or heatwaves with compounding events also becoming more common. These weather extremes and the expected increased frequency of occurrence have been a common topic in public involvement regarding the long-term stability of legacy contamination in the facility subsurface. In response to these concerns, a discussion of the expected outcomes resulting from river flooding and drought is provided below.

11.2.1 Flooding Events

Between September 1-2, 2021, the remnants of Hurricane Ida moved through the Philadelphia region and compounded with a frontal boundary to produce a period of extreme rainfall, with local rates of more than 3 inches of rain per hour and totaling over 10 inches of rain in parts of the Schuylkill River watershed. Rainfall associated with this event was also preceded by significant rainfall on August 28, 2021, when over 3 inches of rain fell at the Philadelphia International Airport. According to the USGS Schuylkill River at Philadelphia Gage 01474500, the river crested at 16.35 feet (gage height) which was the second highest crest on record since the late 1860s. In the tidal section of the river, USGS Schuylkill River near 30th Street at Philadelphia Gage 01474501 recorded a similar crest at 16.25 feet, both considered to represent major river flooding. Because this event occurred during BDH's monitoring of the UDEX release, it serves as a useful proxy for future flooding events and can be used as an example of what to expect regarding stability of legacy groundwater contamination in the presence of flooding.

Figure 2-10-1 of the 2025 Evergreen Sitewide F&T RIR (**Appendix T**) displays river stage data from the USGS gages referenced above in combination with precipitation and data logger hydrographs for a portion of Evergreen's water-level monitoring network. **Figure 4-6** includes additional data logger hydrographs for UDEX release monitoring wells S-431 and S-439 across the same river flooding event. The selected wells are near the river and would be expected to respond to changes in river stage more significantly than wells distal to the river. Of the displayed wells, 5 are screened in the water table (N-163, S-422, S-423, S-431, and S-437) and one is screened in the lower aquifer (B-176). It is worth noting that wells S-422 and S-423 are present along areas of open river bank (no bulkheads). It is also worth noting that the lower aquifer exhibits a much greater response to the semidiurnal tide when compared to the

water table due to the water pressure exerted on the deeper aquifer, which extends under the river in the B-176 and UDEX release areas.

Overall, the data presented on the figures provides evidence that groundwater beneath the UDEX release and surrounding facility is not greatly affected by Schuylkill River flooding events, at least of the duration and magnitude of the September 2021 event which was statistically significant. The observed changes in groundwater elevation (plotted as transducer depth) indicate that the river flood generally resulted in a foot or less of rise in both the water table and lower aquifers near the river, which is within the range of seasonal variability. Importantly, groundwater did not rise to the extent that the ground surface was breached in the monitored areas potentially causing mobilization and daylighting of legacy groundwater contamination sources as has been a source of public concern in response to Evergreen's earlier work.

11.2.2 Prolonged Drought

Periods of prolonged drought can lead to low groundwater levels and reduced stream flows. Of the contaminant transport pathways identified at the UDEX release, groundwater seepage to the Schuylkill River will be discussed under drought conditions.

Along the facility boundary, the Schuylkill River is tidal and demonstrated to be a tide-dominated river system (tidal processes drive river flow rates and stages). This means that even under low flow conditions, the river continues to be flushed, and water levels rise and fall in accordance with Earth's tides (a tidal prism). The surface water modeling presented in Stantec (2025) included a subsection on climate change that evaluated contaminant concentrations in the Schuylkill River from groundwater discharges under 7Q10 flow. That exercise provided a basis for understanding the UDEX release in context in that future groundwater contaminant discharges occurring during anticipated periods of prolonged drought will be like those occurring under present-day, average conditions. A low water table condition resulting from drought would only act to decrease the potential fluxes of groundwater contamination to the Schuylkill River because of overall decreased gradients from groundwater to surface water.

12 Ecological Assessment

Prior to facility redevelopment, most of the UDEX release area was covered by asphalt pavement and urban fill materials, predominantly crushed stone, with limited potential for ecological habitats to exist. These conditions have been maintained through recent earthwork associated with redevelopment. However, a small area of vegetated land exists between River Road and the Schuylkill River that is underlain by UDEX release contamination. This area could support ecological habitat and warranted further assessment (**Figure 1-2a**).

A Pennsylvania Natural Diversity Inventory (PNDI) search performed in April 2025 identified potential endangered and threatened species impacts that required further review by the PA Fish and Boat Commission (PAFBC). The PNDI did not identify the names of the sensitive species, and a follow-up Species Information Request (SIR) letter was submitted to the PAFBC on May 5, 2025. A response was received from the PAFBC on June 27, 2025, indicating that endangered species Atlantic Sturgeon

(*Acipenser oxyrinchus*) and Shortnose Sturgeon (*Acipenser brevirostrum*), and threatened species Northern Red-bellied Cooter (*Pseudemys rubriventris*) are known in the vicinity of the project site. The PNDI search did not identify any potential impacts requiring further review by the other agencies included in the search, the Pennsylvania Game Commission, the Pennsylvania Department of Conservation and Natural Resources, and the United States Fish and Wildlife Service.

To confirm that wetlands are not present in the area, a search of the National Wetlands Inventory (NWI) (https://www.fws.gov/program/national-wetlands-inventory/wetlands-mapper) was performed on July 3, 2025. The closest waterbody identified was the Schuylkill River, and freshwater emergent wetlands and forested/shrub wetlands were also identified approximately one-half mile to the southeast of the UDEX release area. The wetlands identified during the search of the NWI do not represent future site conditions, as these areas are planned to be filled during redevelopment. Additionally, impacts from the UDEX release are not expected to migrate to the identified wetlands (groundwater flow is predominantly NW towards the Schuylkill River).

As such, the only potentially complete pathway for COCs to species of concern is impact to the Schuylkill River via the groundwater to surface water pathway. In **Section 10**, the results of surface water modeling for the UDEX release COCs benzene and toluene are presented, and surface water concentrations are indicated to be below applicable ecological screening criteria. On behalf of BDH, Stantec will complete a SLERA for the UDEX release area which will further evaluate benzene and toluene in Schuylkill River surface water.

Ecological assessment documentation is included in **Appendix K**.

13 Community Relations Activities

BDH is committed to keeping the public informed of the facility's redevelopment and Act 2 program cleanup process, both for the UDEX release and other ongoing environmental projects. BDH hosted its first community meeting during October 2020, and community meetings have been held on an approximately quarterly basis since 2023. In response to the public notices issued along with the UDEX release NIRs, the City of Philadelphia (City) has not requested a formal Public Involvement Plan (PIP). Under Act 2, a response from the City requesting a UDEX release PIP was due by July 4, 2025. It is BDH's goal to continue to host quarterly community meetings during which UDEX release updates can be provided. Community meeting logs, environmental reports, and other public relations are available for the public to view at https://www.thebellwetherdistrict.com/community/.

14 Summary and Conclusions

Stantec has prepared this UDEX release RIR for BDH to satisfy the requirements under Act 2, as specified under 25 PA Code §250.408 (Remedial Investigation Report). The documented activities were conducted in support of BDH's commitment to remediate environmental impacts associated with the UDEX release to the selected SSS remediation standard. Subsurface impacts from the UDEX release

have been characterized and demonstrated to be delineated through multiple-lines-of-evidence. Characterization has been complemented by active remediation since 2018 which at the time of this RIR has resulted in the recovery of an estimated 294,000 gallons of LNAPL, consistent with estimates of the released volume. The remediation success is further exemplified by current groundwater gauging data whereby only one of 14 remaining monitoring wells exhibits measurable LNAPL within the well casing.

Residual LNAPL originating from the UDEX release likely persists in the subsurface and comingles with residual LNAPL that is Pre-Existing Contamination. As a result of the residual LNAPL, elevated concentrations of UDEX release COCs benzene and toluene are expected to persist in the subsurface soil and groundwater until they are degraded through natural attenuation processes. Exposure pathways to potential onsite receptors will be eliminated in BDH's property redevelopment through a combination of engineering (vapor mitigation system) and administrative controls (PPE and permitting requirements). Potentially complete exposure pathways to offsite receptors in the Schuylkill River were identified and will be assessed further.

A numerical assessment of the fate and transport of benzene and toluene in groundwater was prepared for the UDEX release. The objective of the assessment was to complement the remedial investigation process and comply with the PADEP Site-Specific Standard for remediation of contamination under Act 2. To do so, this RIR documents simulation results of a GWF model, groundwater transport modeling, and surface water modeling to conservatively evaluate the present and future magnitude and extent of UDEX release COC impacts to groundwater and surface water. The potential impacts of the UDEX release on Schuylkill River surface water, primarily driven through diffuse groundwater contaminant discharges, are conservatively evaluated by comparing numerical predictions of mass discharge and mixing against surface water criteria using PADEP's TMS water quality analysis model.

Based on the fate and transport assessment the following key takeaways are provided:

- Benzene and toluene are the primary UDEX release COCs in groundwater and represent the compounds listed in the NIR for which BDH is seeking release of liability under Act 2. No other petroleum hydrocarbons were warranted to be carried through the assessment.

- Predictive simulations of dissolved benzene and toluene were performed based upon the calibrated GWF Model, the groundwater transport models, the delineated extent of contamination, and conservative assumptions regarding sources. No UDEX release or other facility remediation system wells were simulated to be pumping during the groundwater transport modeling; therefore, predictive simulations are not dependent upon continued active remediation via groundwater extraction and treatment.

- Initial concentrations were established for the simulations from interpolations of approximately 31 water-table wells and 7 lower aquifer wells using maximum concentrations reported for the January 2024 – January 2025 period, supplemented by earlier data, where warranted through the selection process outlined in the report.

- First-order decaying sources were added to the initial concentrations in the UDEX release plume core to represent remaining benzene and toluene sourced from residual LNAPL.

- Predictive simulations were carried out for 30 years from the initial concentrations which are interpreted to be representative of near steady-state conditions. With conservative inputs, the 30-year duration is sufficient for evaluation of the long-term stability and eventual decay of the groundwater plumes.

- The benzene transport simulation predicts that the dissolved benzene plume is present beyond the Schuylkill River bank to the northwest and forms a comparatively small seepage face where diffuse discharges to surface water may occur. In this area, the benzene mass discharge is predicted to peak in simulation year 28. The benzene plume then gradually decreases over time through natural attenuation and NSZD processes. The model results are interpreted to represent current conditions regarding plume extent that may be overrepresented based on model construction and conservative input conditions.

- The benzene transport model also simulates the dissolved benzene plume migrates vertically down through the upper sand, which constitutes part of the water table, where present, and into the PRM middle sand. Benzene concentrations reaching the middle sand are comparable to the initial concentrations and are generally two to three orders of magnitude lower than the water-table source area.

- The toluene transport simulation indicates that under conservative initial conditions supported by a decaying source area, the toluene plume gradually decreases in size and magnitude over time and does not reach the Schuylkill River at concentrations above the groundwater MSC. Similarly, toluene is not predicted to migrate vertically into the upper sand or lower aquifer above the groundwater MSC.

- Groundwater transport model simulations indicate that contaminant mass leaves the groundwater system through localized discharges to surface water (Schuylkill River), attenuation within the aquifer, and biodegradation. The groundwater transport model was used to estimate mass discharges to surface water which were applied in the PADEP TMS surface water model to evaluate attainment of applicable surface water standards or other selected screening criteria.

- Surface water modeling supports the conclusion that the predicted levels of COCs in the Schuylkill River are likely to be far below the published standards or screening criteria.

- Sensitivity analysis was conducted to evaluate the uncertainty of fate and transport simulations. Numerical results indicate that the uncertainty in the transport parameters result in relatively minor variations of plume areal distribution, length centroid position, and longevity, and that key conclusions related to delineation and identification of pathways are not significantly affected.

In addition, specific to the goals of the fate and transport assessment in completing the remedial investigation process under the Act 2 SSS, the following objectives have been met:

- The extent of contamination attributable to the UDEX release has been sufficiently characterized.

- The fate and transport of groundwater contaminants through the identified UDEX release pathways have been sufficiently characterized.

- The predictive simulation results are being used to inform potential future risks to human and ecological receptors through a risk assessment. It is expected that the simulation results will be used to inform management decisions regarding cleanup goals.

15 References

API (2004). API interactive LNAPL guide. Version 2.04. Soil and Groundwater Technical Task Force.

American Society for Testing and Materials (ASTM) (1998). ASTM Guide for Remediation by Natural Attenuation at Petroleum Release Sites. ASTM E1943. www.astm.org

ASTM D5447-17 (2017). Standard Guide for Application of a Numerical Groundwater Flow Model to a Site-Specific Problem, ASTM International, West Conshohocken, PA, www.astm.org

Balmer, W.T., and Davis, D.K. (1996). Ground-Water Resources of Delaware County, Pennsylvania, Pennsylvania Geological Survey, 4th Series, Water Resources Report 66: 67p.

Bosbyshell, H. (2008). Bedrock Geologic Map of a Portion of the Philadelphia Quadrangle, Montgomery and Philadelphia Counties, Pennsylvania, Pennsylvania Department of Conservation and Natural Resources, Bureau of Topographic and Geologic Survey OFBM 08-05.0.

City of Philadelphia (2017). The Philadelphia City Archives, Records Management Division, City of Philadelphia Department of Records, http://www.phila.gov/phils/carchive.htm

Connor, J.A., R. Kamath, K.L. Walker, and T.E. McHugh (2015). Review of Quantitative Surveys of the Length and Stability of MTBE, TBA, and Benzene Plumes in Groundwater at UST Sites. Groundwater. Vol. 53, No. 2, Pg. 195-206.

Domenico, P.A., and F.W. Schwartz, 1990. Physical and Chemical Hydrogeology. New York, Chichester, Brisbane, Toronto, Singapore: John Wiley & Sons. 824p.

Environment Agency (EA). 2000. Guidance on the Assessment and Monitoring of Natural Attenuation of Contaminants In Groundwater. Environment Agency R&D Publication 95.

Garg, S., and Rixey, W.G. (1999). The Dissolution of Benzene, Toluene, m-Xylene and Naphthalene from a Residually Trapped Non-Aqueous Phase Liquid under Mass Transfer Limited Conditions. Journal of Contaminant Hydrology, Vol. 36, No. 3-4, Pg. 313-331.

Gelhar, L.W., C. Welty, and Rehfeldt, K.R. (1992). A Critical Review of Data on Field-Scale Dispersion in Aquifers. Water Resources Research. Vol. 28, No. 7, Pg. 1955-1974

Greenman, D.W., Rima, D.R., Lockwood, W.N., and Meisler, H. (1961). Groundwater Resources of the Coastal Plain Area of Southeastern Pennsylvania, Pennsylvania Geological Survey Bulletin W13.

Hummel, M. A., Berry, M. S., and Stacey, M. T. (2018). Sea level rise impacts on wastewater treatment systems along the U.S. coasts. Earth's Future, 6(4), 622–633. https://doi.org/10.1002/2017EF000805

Integrated Science & Technology (IST), Inc. (1998). Non-Aqueous Phase Liquid (NAPL) Source Study at Defense Supply Center Philadelphia, Philadelphia, Pennsylvania.

Interstate Technology Regulatory Council (ITRC) (2009). Evaluating LNAPL Remedial Technologies for Achieving Project Goals.

Intergovernmental Panel on Climate Change (IPCC) (2023). Summary for Policymakers. In: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 1-34, doi: 10.59327/IPCC/AR6-9789291691647.001.

Jengo, J.W. (2006). Stratigraphy and Radiocarbon Dates of Pleistocene and Holocene-Age Deposits, Delaware County, Pennsylvania – Rectifying the Presence of the Cape May Formation and the Trenton Gravel in the Delaware Valley, Northeastern Geology & Environmental Sciences, v. 28, no. 1, p. 45-76.

Johnson, P., Lundegard, P., and Liu, Z. (2006). Source Zone Natural Attenuation at Petroleum Hydrocarbon Spill Sites—I: Site-Specific Assessment Approach, Groundwater Monitoring & Remediation, 10.1111/j.1745-6592.2006.00114.x, 26, 4, Pg. 82-92.

Langan (2017). Remedial Investigation Report, Area of Interest 3, Philadelphia Refining Complex, Philadelphia, Pennsylvania.

Lundegard, P.D. and Johnson, P.C. (2006). Source Zone Natural Attenuation at Petroleum Hydrocarbon Spill Sites—II: Application to a Former Oil Field. Groundwater Monitoring & Remediation, Vol. 26, No. 4, Pg. 93-106.

Minnesota Pollution Control Agency (MPCA) (2005). Assessment of Natural Biodegradation at Petroleum Release Sites Guidance Document 4-03.

Navoy, A.S. and Carleton, G.B. (1995). Ground-Water Flow and Future Conditions in the Potomac-Raritan-Magothy Aquifer System, Camden Area, New Jersey, New Jersey Geological Survey Report 38: 184p.

Newell, C.J., and Connor, J.A. (1998). Characteristics of dissolved petroleum hydrocarbon plumes: Results from four studies. American Petroleum Institute Soil and Groundwater Bulletin 8. Washington, DC: American Petroleum Institute.

O'Reilly, O.K, M.A. Lahvis, G.E. DeVaull, and A.M. Deines. (2021). A Comparative Plume Study of DRO, GRO, Benzene, and MTBE: Implications for Risk Management. Groundwater Monitoring and Remediation, Vol. 41, No. 3, Pg. 58-64.

Owens, J.P., and Minard, J.P. (1979). Upper Cenozoic Sediments of the Lower Delaware Valley and Northern Delmarva Peninsula, New Jersey, Pennsylvania, Delaware and Maryland, U.S. Geological Survey Professional Paper 1067-D: 47p.

PADEP, Bureau of Land Recycling and Waste Management (2002). Pennsylvania Code, Title 25. Environmental Protection, Chapter 250. Administration of Land Recycling Program. Commonwealth of Pennsylvania.

PADEP, Bureau of Environmental Cleanup and Brownfields (2019). Land Recycling Program Technical Guidance Manual, Document Number 261-0300-101.

PADEP, Land Recycling Program (2021). Statewide Health Standards https://www.dep.pa.gov/Business/Land/LandRecycling/Standards-Guidance-Procedures/Pages/Statewide-Health-Standards.aspx

Panday, S., Langevin, C.D., Niswonger, R.G., Ibaraki, Motomu, and Hughes, J.D. (2013). MODFLOW-USG version 1: An unstructured grid version of MODFLOW for simulating groundwater flow and tightly coupled processes using a control volume finite-difference formulation: U.S. Geological Survey Techniques and Methods, book 6, chap. A45, 66 p.

Panday, S. (2022). USG-Transport Version 1.10.0: Transport and other Enhancements to MODFLOW-USG. GSI Environmental.

Pennsylvania Code, Title 25. Environmental Protection, Chapter 93. Water Quality Standards.

Rivett, M.O., and Thornton, S.F. (2008). Monitored Natural Attenuation of Organic Contaminants in Groundwater: Principles and application. Institution of Civil Engineers Water Management Vol. 161, No. 6, Pg. 381-392.

Schreffler, C.L. (2001). Simulation of Ground-Water Flow in the Potomac-Raritan-Magothy Aquifer System Near the Defense Supply Center Philadelphia, and the Point Breeze Refinery, Southern Philadelphia County, Pennsylvania, U.S. Geological Survey Water-Resources Investigations Report 01-4218: 48p.

Sevon, W.D. and Braun, D.D. (2000). Glacial Deposits of Pennsylvania, Pennsylvania Department of Conservation and Natural Resources, Bureau of Topographic and Geologic Survey Map Series No. 59 (2200-MP-DCNR3027).

Sevon, W.D., Fleeger, G.M., and Shepps, V.C. (1999). Pennsylvania and the Ice Age (2nd Edition), Pennsylvania Geological Survey, 4th Series, Educational Series 6: 30p.

Sloto, R.A. (1988). Simulation of Ground-Water Flow in the Lower Sand Unit of the Potomac-Raritan-Magothy Aquifer System, Philadelphia, Pennsylvania, U.S. Geological Survey Water-Resources Investigations Report 86-4055: 51p.

Sloto, R.A. (2012). Migration of Benzene and Simulated Groundwater Flow in the Potomac-Raritan-Magothy Aquifer System of South Philadelphia, Pennsylvania, U.S. Geological Survey Administrative Report: 62p.

Stantec (2025). Volume 2: Fate and Transport Remedial Investigation Report, Revised, Former Philadelphia Refinery. Philadelphia, Pennsylvania. Prepared for: Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC. January 3, 2025.

Suarez, M.P., and Rifai, H.S. (1999). Biodegradation rates for fuel hydrocarbons and chlorinated solvents in ground water. Bioremediation Journal. 3, No. 4, Pg. 337–362.

Sugarman, P. (2017). A Geologic Perspective on the Potomac-Raritan-Magothy Aquifer System, Association of Environmental & Engineering Geologists, New York – Philadelphia Chapter, Dinner Meeting Presentation Abstract, November 16, 2017, Somerset, New Jersey.

Surface Mapping System, Surfer, Version 27 (2024). Copyright by Golden Software, LLC. Available at www.goldensoftware.com

United States Environmental Protection Agency (USEPA) (1999a). Monitored Natural Attenuation of Petroleum Hydrocarbons. U.S. EPA Remedial Technology Fact Sheet. EPA/600/F-98/021. Washington, D.C.

USEPA (1999b). Aerobic biodegradation of organic chemicals in environmental media: a summary of field and laboratory studies, Environmental Science Center, Syracuse Research Corporation for the US Environmental Protection Agency.

USEPA (2000). National Recommended Water Quality Criteria – Human Health Criteria Table. https://www.epa.gov/wqc/national-recommended-water-quality-criteria-human-health-criteria-table.

Walton, W.C. (1988). Practical Aspects of Groundwater Modeling: National Water Well Association, Worthington, Ohio, 587 p.

Weston (2004). Remedial Investigation Report, Passyunk Facility, Philadelphia Gas Works.

Wiedemeier, T.H., Rifai, H.S., Newell, C.J., and Wilson, J.T. (1999). Natural Attenuation of Fuels and Chlorinated Solvents in the Subsurface. Wiley, New York, 1999.

Wiedemeier, T.H., Swanson, M.A., Wilson, J. T., Kampbell, D.H., Miller, R. N., and Hansen, J.E. (1996). Approximation of Biodegradation Rate Constants for Monoaromatic Hydrocarbons (BTEX) in Ground Water, Ground Water Monitoring and Remediation, 16, 186-19.

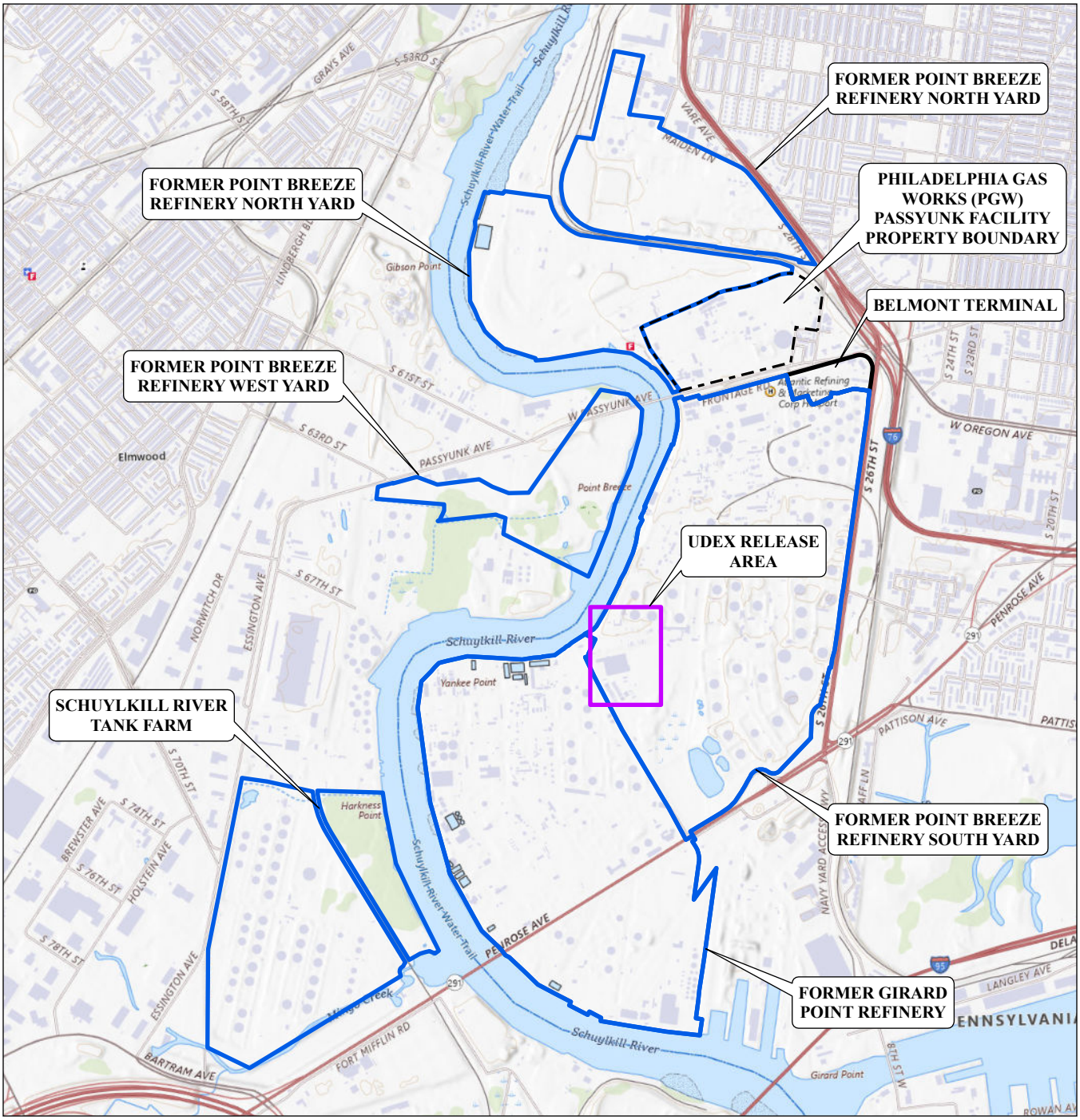
Woessner, W.W. and Poeter, E.P. (2020). Hydrogeologic Properties of Earth Materials and Principles of Groundwater Flow. The Groundwater Project. <https://doi.org/10.21083/978-1-7770541-2-0>

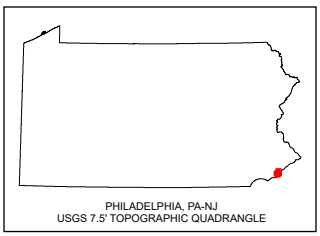
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Stantec is a global leader in sustainable architecture, engineering, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.



Figures





Legend

- UDEX Release Area
- Former PES Refinery
- Belmont Terminal
- Philadelphia Gas Works (PGW) Passyunk Facility Property Boundary

0 1,100 2,200 Feet

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Stantec

Project Location
City of Philadelphia,
Philadelphia County, PA

Prepared by GWC on 2025-05-29
TR Review by ADK on 2025-07-15
IR Review by JKK on 2025-07-21

Client/Project 195603450
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.
1-1

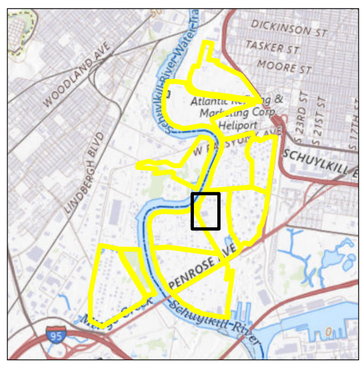
Title
Site Location Map

Notes
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Data Sources: Stantec, USGS
3. Background: USGS Topo Layers (TMN): USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road data; Natural Earth Data; U.S. Department of State HIU; NOAA National Centers for Environmental Information. Data refreshed July, 2025.

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Legend

- Unconfined Aquifer Well (PES)
- Lower Aquifer Well (PES)
- Unconfined Aquifer Well (Evergreen)
- Lower Aquifer Well (Evergreen)
- OIHPT Boring
- OIHPT Boring, Rotosonic Boring, Monitoring Well
- OIHPT Boring, Monitoring Well
- Rotosonic Boring, Monitoring Well
- UVOST-HP Boring
- MiHpt Boring
- Fossil Fuel Trap
- AGI Passive Soil Gas Sampler
- Former UDEX Feed Line (underground section)
- ERI Transect

Bulkhead Location
General Construction

- Concrete Wall
- Masonry Wall
- Steel Sheeting
- Timber Sheeting
- Former Philadelphia Refinery Area of Interest (AOI) Boundary
- Texas Eastern/PGW Metering Station
- Former Central Warehouse

Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Data Sources: Stantec
3. Background: USGS Topo Layers (TMN): USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road data; Natural Earth Data; U.S. Department of State HIU; NOAA National Centers for Environmental Information. Data refreshed July, 2025. PEMA Philadelphia County 2022 Aerial.

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Feet
(At original document size of 22x34)
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N

Stantec

Project Location
City of Philadelphia,
Philadelphia County, PA

Prepared by GWC on 2025-05-29
TR Review by ADK on 2025-07-15
IR Review by JKK on 2025-07-21

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

195603450

Figure No.
1-2a

Title **Investigation Site Plan**

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Legend

- SVE Well (PES)
- AS Well (PES)
- Monitoring Well
- Vapor Point
- Former UDEX Feed Line (underground section)

Bulkhead Location
General Construction

- Concrete Wall
- Masonry Wall
- Steel Sheeting
- Timber Sheeting
- Former Philadelphia Refinery Area of Interest (AOI) Boundary
- Former Central Warehouse
- Texas Eastern/PGW Metering Station

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Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Data Sources: Stantec
3. Background: USGS Topo Layers (TMN): USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road data; Natural Earth Data; U.S. Department of State HIU; NOAA National Centers for Environmental Information. Data refreshed July, 2025. PEMA Philadelphia County 2022 Aerial.

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REFINING & MARKETING LLC
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195603450

Figure No.
1-2b

Title **Remediation Site Plan**

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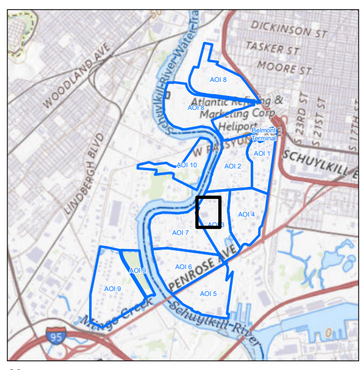
Location	Units	Non-Res Direct Contact with Surface Soil MSC (0-2 ft)	Non-Res Direct Contact with Subsurface Soil MSC (2-15 ft)	Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC	S-429								
Collection Depth (ft bgs)					10.0 - 11.3	12.0 - 13.3	14.0 - 15.3	16.0 - 17.3	18.0 - 19.2	20.0 - 21.0	22.0 - 23.3	24.0 - 25.5	26.0 - 27.5
Sample Date					9/19/2018	9/19/2018	9/19/2018	9/19/2018	9/19/2018	9/19/2018	9/19/2018	9/19/2018	9/19/2018
Volatile Organic Compounds													
Benzene	mg/kg	280	330	0.5	14 (0.019)	6.4 (0.018)	3.8 (0.022)	120 (0.19)	1300 (3.5)	160 (0.36)	38 (0.43)	14 (0.021)	20 (0.037)
Toluene	mg/kg	10000	10000	100	0.001 J (0.0003)	0.024 (0.0003)	0.19 (0.0003)	180 (1.4)	790 (2.6)	21 (0.067)	0.75 (0.032)	2.8 (0.016)	10 (0.014)

Location	Units	Non-Res Direct Contact with Surface Soil MSC (0-2 ft)	Non-Res Direct Contact with Subsurface Soil MSC (2-15 ft)	Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC	302-AM01-c					
Collection Depth (ft bgs)					0.5 - 1.0	2.0 - 2.5	3.0 - 3.5	4.5 - 5.0	0.0 - 0.5	0.6 - 1.1
Sample Date					10/24/2022	10/24/2022	10/24/2022	10/24/2022	10/6/2022	10/6/2022
Volatile Organic Compounds										
Benzene	mg/kg	280	330	0.5	2.8 (0.027)	0.0041 (0.00053)	ND (0.00054)	0.00023 J (0.00046)	0.0012 (0.00075)	0.037 (0.00051)

Location	Units	Non-Res Direct Contact with Surface Soil MSC (0-2 ft)	Non-Res Direct Contact with Subsurface Soil MSC (2-15 ft)	Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC	302-AN01-c		
Collection Depth (ft bgs)					1.1 - 1.6	1.7 - 2.2	2.2 - 2.7
Sample Date					10/6/2022	10/6/2022	10/6/2022
Volatile Organic Compounds							
Benzene	mg/kg	280	330	0.5	1 (0.022)	3 (0.026)	7.8 (0.028)

Location	Units	Non-Res Direct Contact with Surface Soil MSC (0-2 ft)	Non-Res Direct Contact with Subsurface Soil MSC (2-15 ft)	Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC	S-428						
Collection Depth (ft bgs)					10.0 - 12.0	12.0 - 13.0	14.0 - 15.0	16.0 - 16.8	18.0 - 19.0	20.0 - 20.7	22.0 - 23.0
Sample Date					9/18/2018	9/18/2018	9/18/2018	9/18/2018	9/18/2018	9/18/2018	9/18/2018
Volatile Organic Compounds											
Benzene	mg/kg	280	330	0.5	4.6 (0.17)	2.9 (0.094)	ND (0.018)	0.004 J (0.0004)	0.25 (0.017)	0.007 (0.0004)	0.077 (0.0004)

Location	Units	Non-Res Direct Contact with Surface Soil MSC (0-2 ft)	Non-Res Direct Contact with Subsurface Soil MSC (2-15 ft)	Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC	S-507
Collection Depth (ft bgs)					10.5
Sample Date					6/27/2023
Volatile Organic Compounds					
Benzene	mg/kg	280	330	0.5	73 (2.2)
Toluene	mg/kg	10000	10000	100	110 (4.3)



Legend

- Monitoring Well
- No Surface Soil Exceedance of the Non-Res Direct Contact with Soil MSC, or Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC
- No Subsurface Soil Exceedance of the Non-Res Direct Contact with Soil MSC, or Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC
- Subsurface Soil (>2 ft) Exceedance of the Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC
- Subsurface Soil (2 – 15 ft) Exceedance of the Non-Res Direct Contact with Soil MSC
- Former Philadelphia Refinery Area of Interest (AOI) Boundary

- 1300 (3.5) — Concentrations Exceed the Non-Res Direct Contact with Soil MSC (2 - 15 ft)
- 120(0.19) — Underlined concentrations exceed the Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC (laboratory Reporting Limits indicated in parentheses)
- ND — Not Detected
- J — Estimated Concentration

Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Data Sources: Stantec
3. SHS = Statewide Health Standard; MSC = Medium Specific Concentration; GW = groundwater; Non-Res = Non-Residential; TDS = total dissolved solids; mg/kg = milligrams per kilogram; ft bgs = feet below ground surface
4. Background: USGS Topo Layers (TMN): USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road data; Natural Earth Data; U.S. Department of State HIU; NOAA National Centers for Environmental Information. Data refreshed July, 2025. PEMA Philadelphia County 2022 Aerial.

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N

Stantec

Project Location
City of Philadelphia,
Philadelphia County, PA

Prepared by GWC on 2025-05-29
TR Review by ADK on 2025-07-15
IR Review by JKK on 2025-07-21

Client/Project
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PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.
3-1a

Title
Soil Sample Locations and Results - MSCs

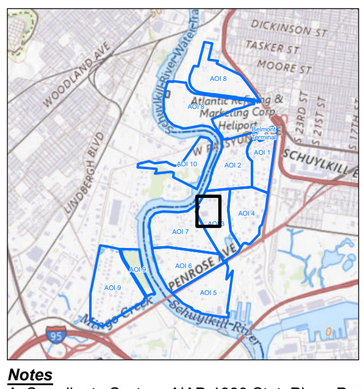
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Location	Units	US EPA Regional Screening Levels for Industrial Soil (TR=1E-06, THQ=0.1)	S-429								
Collection Depth (ft bgs)			10.0 - 11.3	12.0 - 13.3	14.0 - 15.3	16.0 - 17.3	18.0 - 19.2	20.0 - 21.0	22.0 - 23.3	24.0 - 25.5	26.0 - 27.5
Sample Date			9/19/2018	9/19/2018	9/19/2018	9/19/2018	9/19/2018	9/19/2018	9/19/2018	9/19/2018	9/19/2018
Volatile Organic Compounds											
Benzene	mg/kg	5.1	**14 (0.019)**	**6.4 (0.018)**	3.8 (0.022)	**120 (0.19)**	**1300 (3.5)**	**160 (0.36)**	**38 (0.43)**	**14 (0.021)**	**20 (0.037)**

Location	Units	US EPA Regional Screening Levels for Industrial Soil (TR=1E-06, THQ=0.1)	302-AN01-c		
Collection Depth (ft bgs)			1.1 - 1.6	1.7 - 2.2	2.2 - 2.7
Sample Date			10/6/2022	10/6/2022	10/6/2022
Volatile Organic Compounds					
Benzene	mg/kg	5.1	1 (0.022)	3 (0.026)	**7.8 (0.028)**

Location	Units	US EPA Regional Screening Levels for Industrial Soil (TR=1E-06, THQ=0.1)	S-507
Collection Depth (ft bgs)			10.5
Sample Date			6/27/2023
Volatile Organic Compounds			
Benzene	mg/kg	5.1	**73 (2.2)**



Legend

- Monitoring Well
- No Surface Soil Exceedance of the EPA RSL for Industrial Soil (TR=1E-06, THQ=0.1)
- No Subsurface Soil Exceedance of the EPA RSL for Industrial Soil (TR=1E-06, THQ=0.1)
- Subsurface Soil (>2 ft) Exceedance of the EPA RSL for Industrial Soil (TR=1E-06, THQ=0.1)
- Former Philadelphia Refinery Area of Interest (AOI) Boundary

73(2.2) Boldfaced concentrations exceed the US EPA RSL for Industrial Soil (TR=1E-06, THQ=0.1) (laboratory Reporting Limits indicated in parentheses)

Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Data Sources: Stantec
3. US EPA = United States Environmental Protection Agency; RSL = Regional Screening Level; TR = Target Risk; THQ = Target Hazard Quotient; mg/kg = milligrams per kilogram; ft bgs = feet below ground surface
4. Background: USGS Topo Layers (TMN): USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road data; Natural Earth Data; U.S. Department of State HIU; NOAA National Centers for Environmental Information. Data refreshed July, 2025.PEMA Philadelphia County 2022 Aerial.

0 60 120 Feet
(At original document size of 22x34)
1:720

N

Stantec

Project Location
City of Philadelphia,
Philadelphia County, PA

Prepared by GWC on 2025-05-29
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195603450

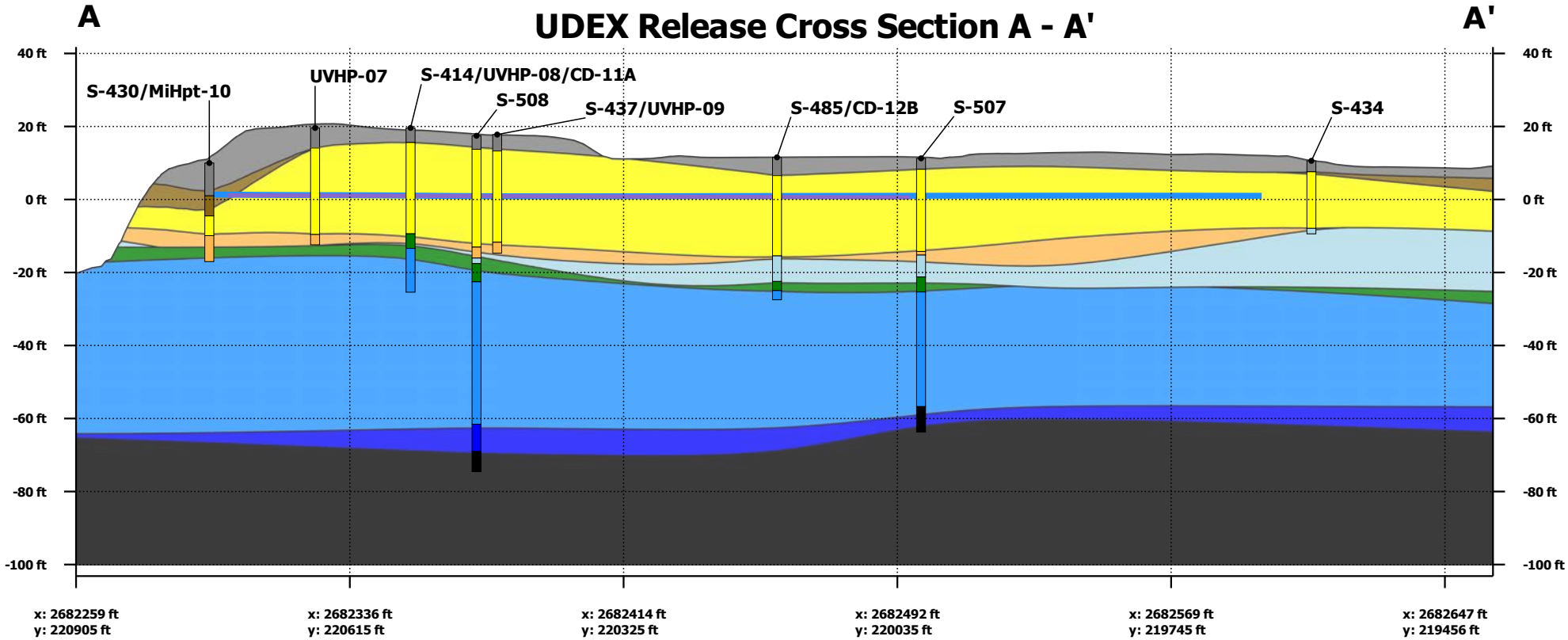
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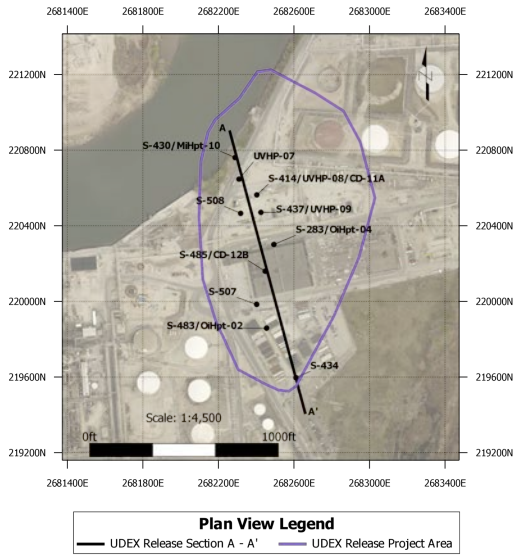
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Soil Sample Locations and Results - RSLs

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UDEX Release Cross Section A - A'





Cross Section Legend

UDEX Release CSM Geologic Units*

- UF
- Kuc
- Kms
- Qh
- Kus
- Kls
- Qcm
- Kmc
- BEDROCK

April 2021 Groundwater Surfaces

- Water-Table Elevation
- Lower Aquifer Elevation

Scale: 1:2,000

Vertical exaggeration: 4x

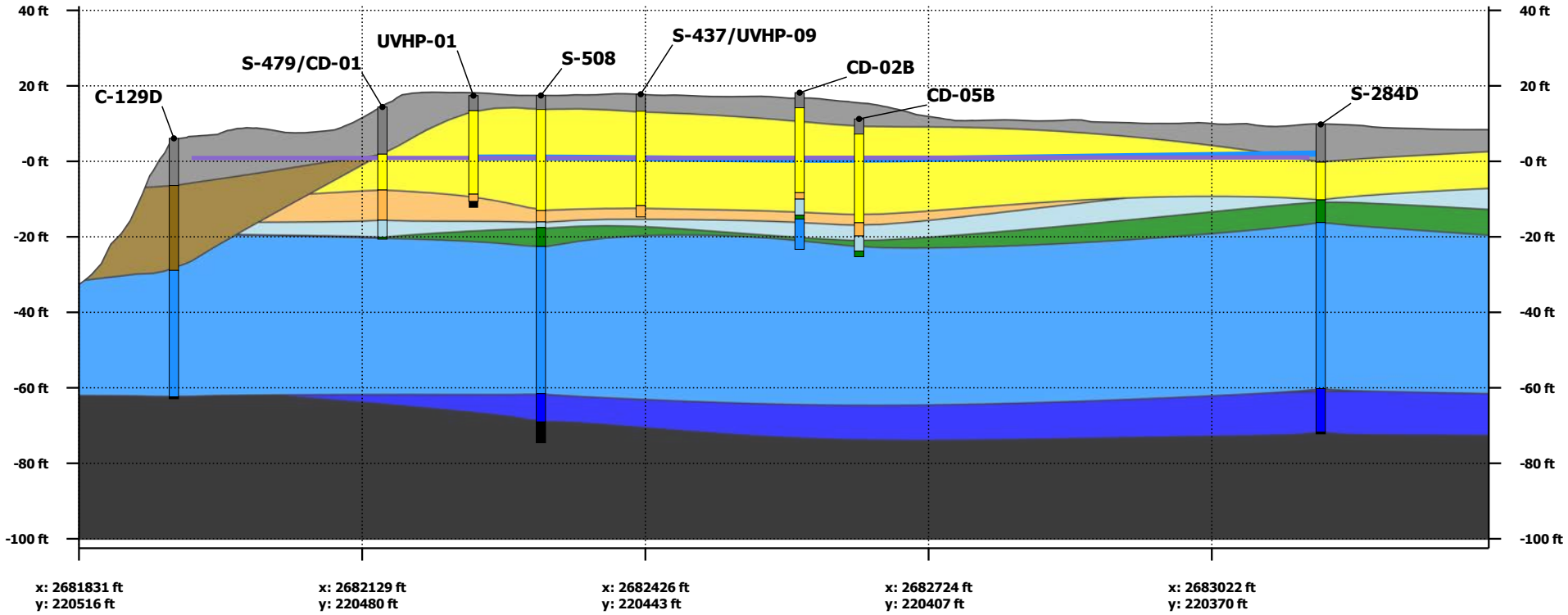
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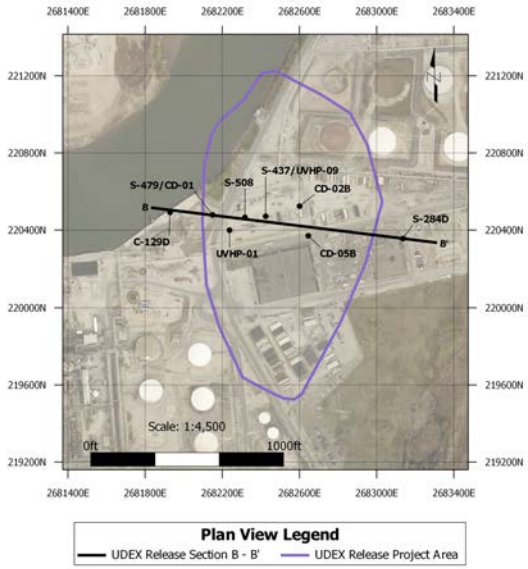
Stantec

*Notes on Geologic Units:
UF = urban fill; Qh = Holocene alluvium; Qcm = Pleistocene alluvium; Kuc = upper clay unit; Kus = upper sand unit; Kmc = middle clay unit; Kms = middle sand unit; Klc = lower clay unit; Kls = lower sand unit

Responsible dept.	Technical reference	Creator	Approved by	
Stantec	Figure 4-1	A Klingbeil	A Wright	
Legal owner Bellwether District Holdings, LLC 3144 West Passyunk Avenue Philadelphia, PA 19145		Document type Cross Section	Document status FINAL	
		Title UDEX Release RIR Former PES Refinery 3144 West Passyunk Avenue Philadelphia, PA 19145	Identification number UDEX Release Cross Section A - A'	
			Rev. 1	Date of issue 6/12/2025	Sheet 1/1

UDEX Release Cross Section B - B'





Cross Section Legend

UDEX Release CSM Geologic Units*

UF, Kuc, Kms, BEDROCK
Qh, Kus, Klc
Qcm, Kmc, Kls

April 2021 Groundwater Surfaces

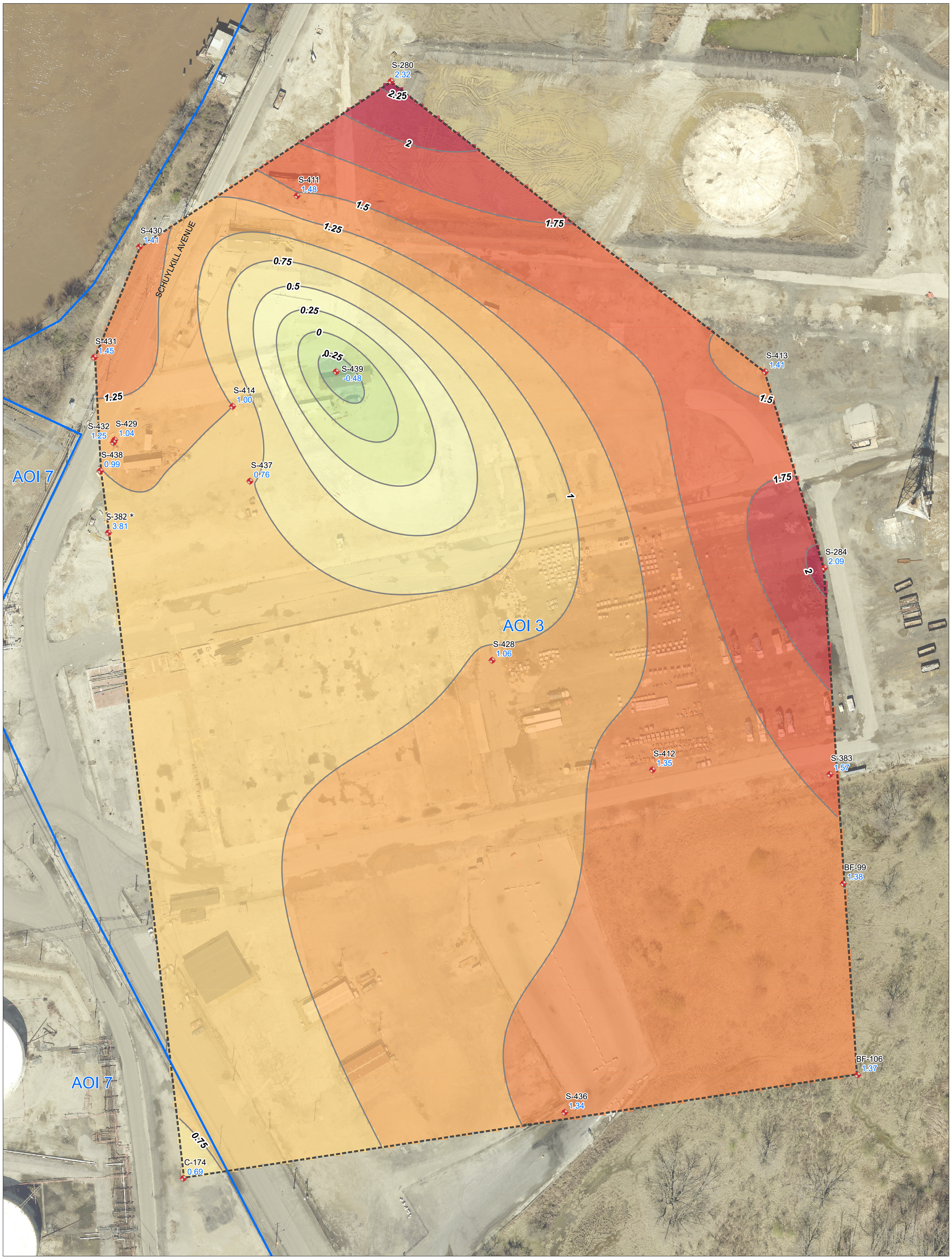
Water-Table Elevation
Lower Aquifer Elevation

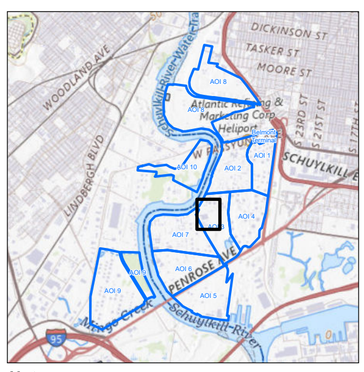
Scale: 1:2,000
Vertical exaggeration: 4x
0ft 300ft

Stantec

*Notes on Geologic Units:
UF = urban fill; Qh = Holocene alluvium; Qcm = Pleistocene alluvium; Kuc = upper clay unit; Kus = upper sand unit; Kmc = middle clay unit; Kms = middle sand unit; Klc = lower clay unit; Kls = lower sand unit

Responsible dept.	Technical reference	Creator	Approved by	
Stantec	Figure 4-2	A Klingbeil	A Wright	
Legal owner Bellwether District Holdings, LLC 3144 West Passyunk Avenue Philadelphia, PA 19145		Document type Cross Section	Document status FINAL	
		Title UDEX Release RIR Former PES Refinery 3144 West Passyunk Avenue Philadelphia, PA 19145	Identification number UDEX Release Cross Section B - B'	
			Rev. 1	Date of issue 6/12/2025	Sheet 1/1





Legend

- Monitoring Well Screened in Unconfined Aquifer, Utilized for April 2021 Elevation Surface
- April 2021 Unconfined Aquifer Groundwater Elevation Contour
- Former Philadelphia Refinery Area of Interest (AOI) Boundary
- Limits of Interpolation
- 4.91 Corrected Groundwater Elevation (FT NAVD88)
- * Anomalous Observation not used in the Interpolation

April 2021 Water-Table Elevation
FT NAVD88

2.25 to 2.50
2.00 to 2.25
1.75 to 2.00
1.50 to 1.75
1.25 to 1.50
1.00 to 1.25
0.75 to 1.00
0.50 to 0.75
0.25 to 0.50
0.00 to 0.25
-0.25 to 0.00
-0.50 to -0.25
-0.75 to -0.50
-1.00 to -0.75
-1.25 to -1.00
-1.50 to -1.25
-1.75 to -1.50

0 60 120 Feet
(At original document size of 22x34)
1:720

N

Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Data Sources: Stantec
3. Depth to groundwater and LNAPL, where present, were measured in each well to the nearest one-hundredth of a foot using an interface probe.
4. FT NAVD88 = feet referenced to the North American Vertical Datum of 1988
5. Groundwater elevation data was interpolated using point kriging with a linear variogram model in Surfer to produce a surface model shown in rainbow color flooding. The model is interpreted to be a reasonable approximation of the unconfined aquifer elevation within the limits of the available well data.
6. Background: USGS Topo Layers (TMN): USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road data; Natural Earth Data; U.S. Department of State HIU; NOAA National Centers for Environmental Information. Data refreshed July, 2025.PEMA Philadelphia County 2022 Aerial.

Stantec

Project Location
City of Philadelphia,
Philadelphia County, PA

Prepared by GWC on 2025-05-29
TR Review by ADK on 2025-07-15
IR Review by JKK on 2025-07-21

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

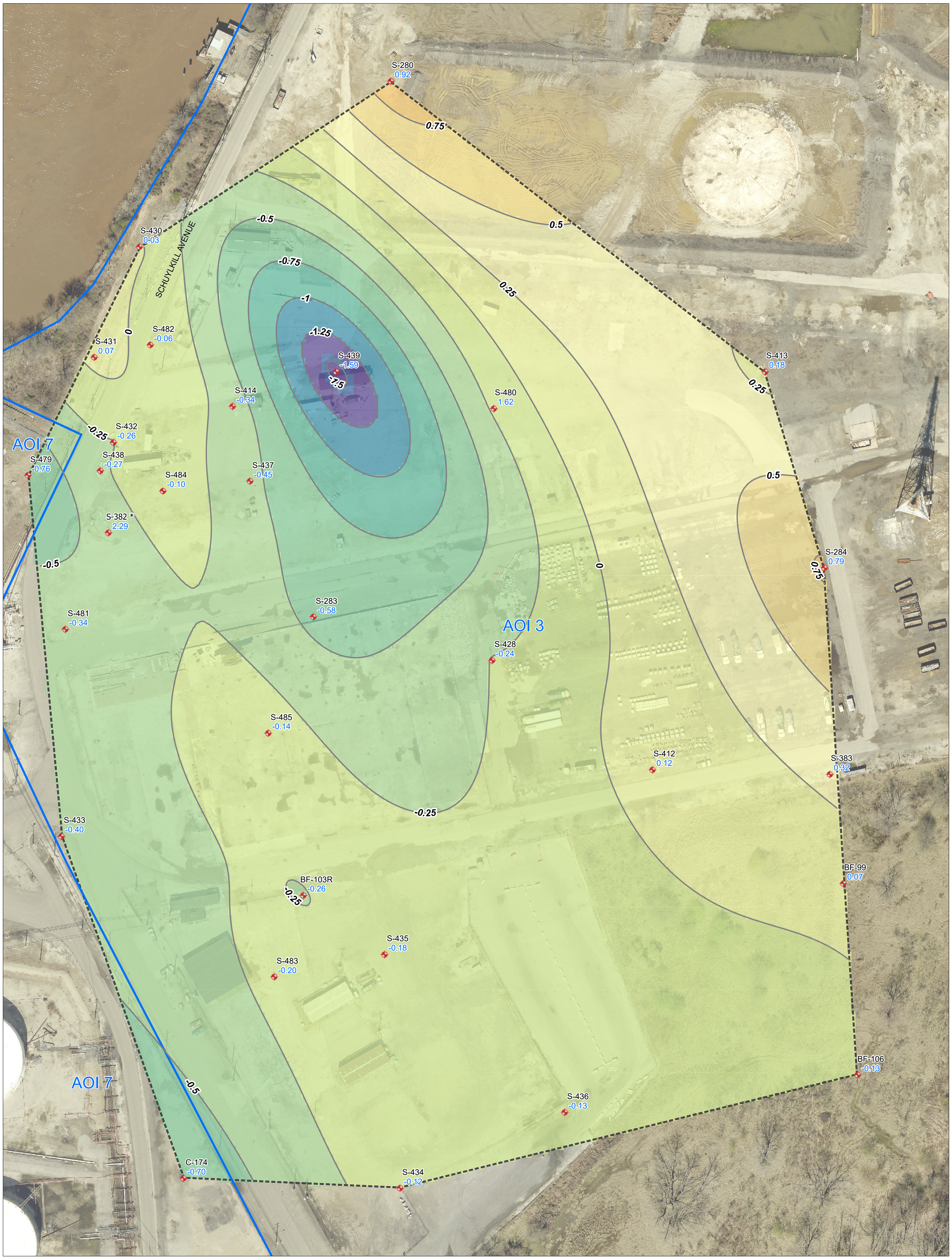
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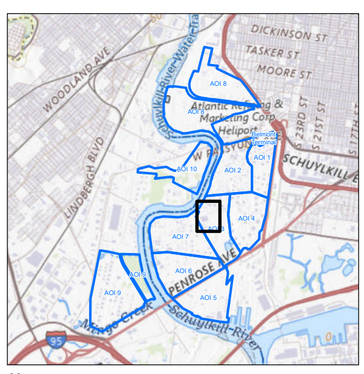
Figure No.
4-3a

Title
Unconfined Aquifer Elevation, April 2021

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Legend

- Monitoring Well Screened in Unconfined Aquifer, Utilized for March 2022 Elevation Surface
- March 2022 Unconfined Aquifer Groundwater Elevation Contour
- Former Philadelphia Refinery Area of Interest (AOI) Boundary
- Limits of Interpolation
- 4.91 — Corrected Groundwater Elevation (FT NAVD88)
- * — Anomalous Observation not used in the Interpolation

March 2022 Water-Table Elevation
FT NAVD88

- 2.25 to 2.50
- 2.00 to 2.25
- 1.75 to 2.00
- 1.50 to 1.75
- 1.25 to 1.50
- 1.00 to 1.25
- 0.75 to 1.00
- 0.50 to 0.75
- 0.25 to 0.50
- 0.00 to 0.25
- -0.25 to 0.00
- -0.50 to -0.25
- -0.75 to -0.50
- -1.00 to -0.75
- -1.25 to -1.00
- -1.50 to -1.25
- -1.75 to -1.50

0 60 120 Feet
(At original document size of 22x34)
1:720

N

Stantec

Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Data Sources: Stantec
3. Depth to groundwater and LNAPL, where present, were measured in each well to the nearest one-hundredth of a foot using an interface probe.
4. FT NAVD88 = feet referenced to the North American Vertical Datum of 1988
5. Groundwater elevation data was interpolated using point kriging with a linear variogram model in Surfer to produce a surface model shown in rainbow color flooding. The model is interpreted to be a reasonable approximation of the unconfined aquifer elevation within the limits of the available well data.
6. Background: USGS Topo Layers (TMN): USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road data; Natural Earth Data; U.S. Department of State HIU; NOAA National Centers for Environmental Information. Data refreshed July, 2025.PEMA Philadelphia County 2022 Aerial.

Project Location
City of Philadelphia,
Philadelphia County, PA

Prepared by GWC on 2025-05-29
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IR Review by JKK on 2025-07-21

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
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FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

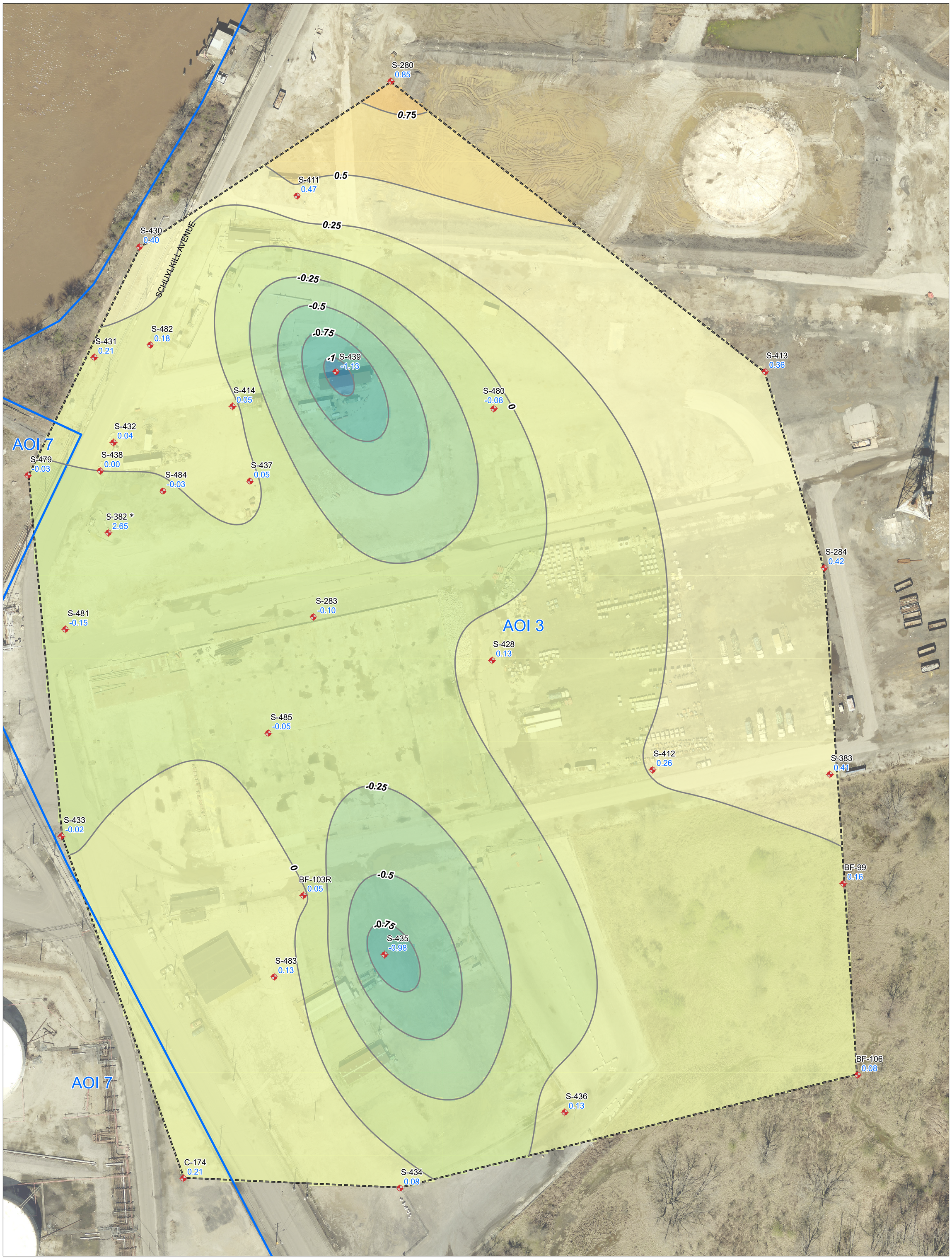
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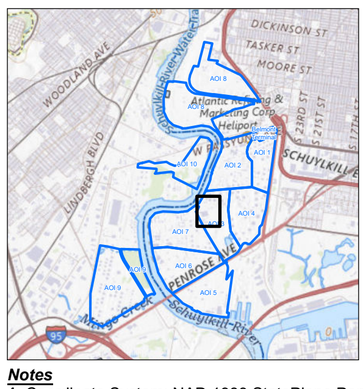
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Title
Unconfined Aquifer Elevation, March 2022

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Legend

- Monitoring Well Screened in Unconfined Aquifer, Utilized for April 2023 Elevation Surface
- April 2023 Unconfined Aquifer Groundwater Elevation Contour
- Former Philadelphia Refinery Area of Interest (AOI) Boundary
- Limits of Interpolation
- 4.91 — Corrected Groundwater Elevation (FT NAVD88)
- * — Anomalous Observation not used in the Interpolation

April 2023 Water-Table Elevation
FT NAVD88

- 2.25 to 2.50
- 2.00 to 2.25
- 1.75 to 2.00
- 1.50 to 1.75
- 1.25 to 1.50
- 1.00 to 1.25
- 0.75 to 1.00
- 0.50 to 0.75
- 0.25 to 0.50
- 0.00 to 0.25
- -0.25 to 0.00
- -0.50 to -0.25
- -0.75 to -0.50
- -1.00 to -0.75
- -1.25 to -1.00
- -1.50 to -1.25
- -1.75 to -1.50

0 60 120 Feet
(At original document size of 22x34)
1:720

N

Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Data Sources: Stantec
3. Depth to groundwater and LNAPL, where present, were measured in each well to the nearest one-hundredth of a foot using an interface probe.
4. FT NAVD88 = feet referenced to the North American Vertical Datum of 1988
5. Groundwater elevation data was interpolated using point kriging with a linear variogram model in Surfer to produce a surface model shown in rainbow color flooding. The model is interpreted to be a reasonable approximation of the unconfined aquifer elevation within the limits of the available well data.
6. Background: USGS Topo Layers (TMN): USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road data; Natural Earth Data; U.S. Department of State HIU; NOAA National Centers for Environmental Information. Data refreshed July, 2025.PEMA Philadelphia County 2022 Aerial.

Stantec

Project Location
City of Philadelphia,
Philadelphia County, PA

Prepared by GWC on 2025-05-29
TR Review by ADK on 2025-07-15
IR Review by JKK on 2025-07-21

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

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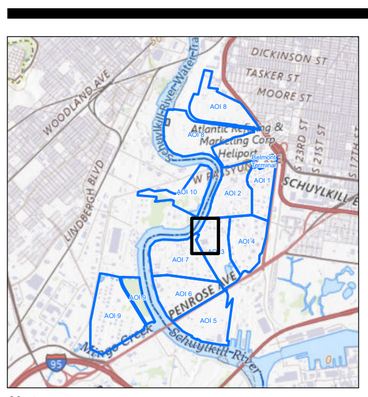
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4-3c

Title
Unconfined Aquifer Elevation, April 2023

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Legend

- Monitoring Well Screened in Lower Aquifer, Utilized for April 2021 Elevation Surface
- April 2021 Lower Aquifer Groundwater Elevation Contour
- Former Philadelphia Refinery Area of Interest (AOI) Boundary
- Limits of Interpolation
- 4.91 Corrected Groundwater Elevation (FT NAVD88)

April 2021 Lower Aquifer Elevation
FT NAVD88

- 1.4 to 1.6
- 1.2 to 1.4
- 1.0 to 1.2
- 0.8 to 1.0
- 0.6 to 0.8
- 0.4 to 0.6

0 70 140 Feet
(At original document size of 22x34)
1:840

N

Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Data Sources: Stantec
3. Depth to groundwater and LNAPL, where present, were measured in each well to the nearest one-hundredth of a foot using an interface probe.
4. FT NAVD88 = feet referenced to the North American Vertical Datum of 1988
5. Groundwater elevation data was interpolated using point kriging with a linear variogram model in Surfer to produce a surface model shown in rainbow color flooding. The model is interpreted to be a reasonable approximation of the unconfined aquifer elevation within the limits of the available well data.
6. Background: USGS Topo Layers (TMN): USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road data; Natural Earth Data; U.S. Department of State HIU; NOAA National Centers for Environmental Information. Data refreshed July, 2025.PEMA Philadelphia County 2022 Aerial.

Stantec

Project Location
City of Philadelphia,
Philadelphia County, PA

Prepared by GWC on 2025-05-29
TR Review by ADK on 2025-07-15
IR Review by JKK on 2025-07-21

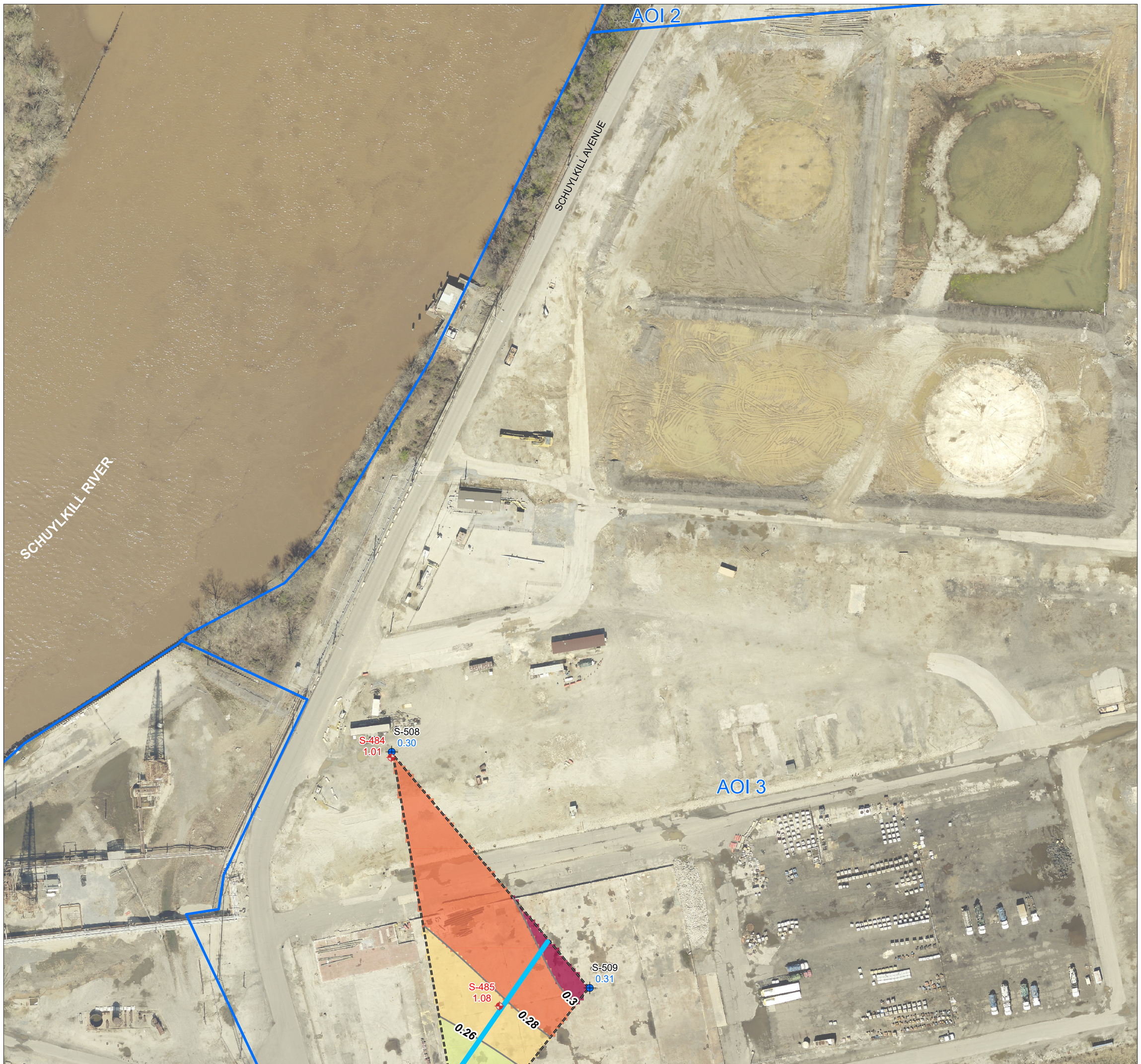
Client/Project
195603450
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

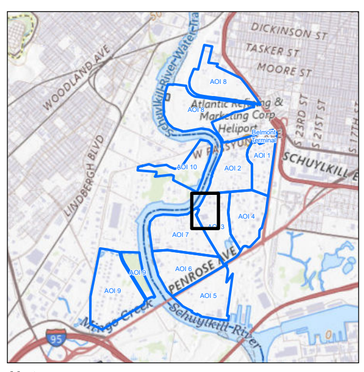
Figure No.
4-4a

Title
Lower Aquifer Elevation, April 2021

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Legend

- Monitoring Well Screened in Lower Aquifer, Utilized for July 2023 Elevation Surface
- Monitoring Well Screened in Unconfined Aquifer, Utilized for Head Potential Review
- July 2023 Lower Aquifer Groundwater Elevation Contour
- Estimated Direction of Lower Aquifer Groundwater Flow
- Former Philadelphia Refinery Area of Interest (AOI) Boundary
- Limits of Interpolation
- 4.91 — Lower Aquifer Corrected Groundwater Elevation (FT NAVD88)
- 1.08 — Unconfined Aquifer Corrected Groundwater Elevation (FT NAVD88)

July 2023 Lower Aquifer Elevation
FT NAVD88

- 0.30 to 0.32
- 0.28 to 0.30
- 0.26 to 0.28
- 0.24 to 0.26
- 0.22 to 0.24
- 0.20 to 0.22

0 70 140 Feet
(At original document size of 22x34)
1:840

N

Stantec

Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Data Sources: Stantec
3. Depth to groundwater and LNAPL, where present, were measured in each well to the nearest one-hundredth of a foot using an interface probe.
4. FT NAVD88 = feet referenced to the North American Vertical Datum of 1988
5. Groundwater elevation data was interpolated using point kriging with a linear variogram model in Surfer to produce a surface model shown in rainbow color flooding. The model is interpreted to be a reasonable approximation of the unconfined aquifer elevation within the limits of the available well data.
6. Background: USGS Topo Layers (TMN): USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road data; Natural Earth Data; U.S. Department of State HIU; NOAA National Centers for Environmental Information. Data refreshed July, 2025.PEMA Philadelphia County 2022 Aerial.

Project Location
City of Philadelphia,
Philadelphia County, PA

Prepared by GWC on 2025-05-29
TR Review by ADK on 2025-07-15
IR Review by JKK on 2025-07-21

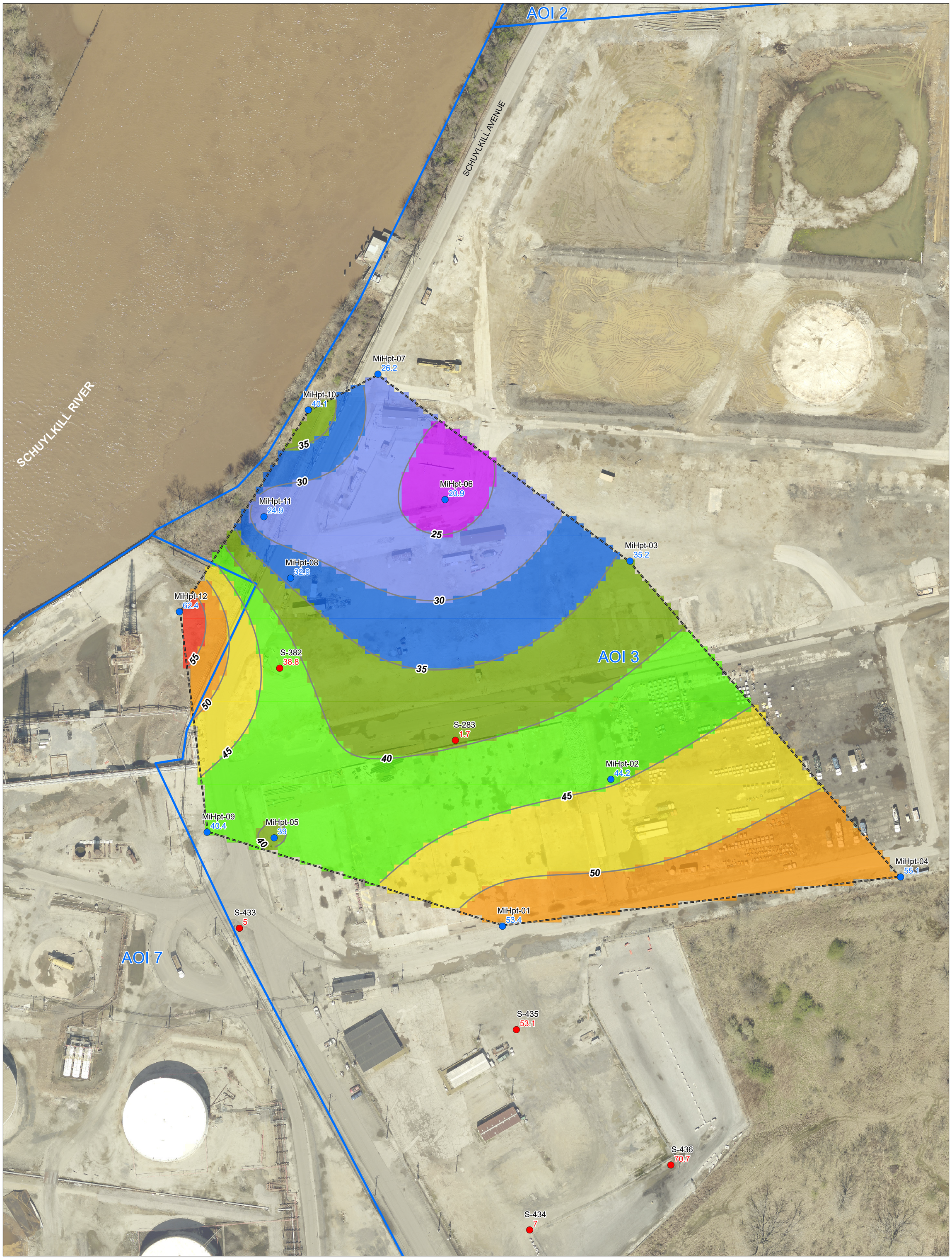
Client/Project 195603450
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REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

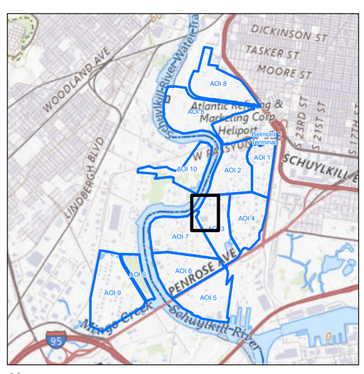
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4-4b

Title
Lower Aquifer Elevation and Head Potentials, July 2023

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Legend

- Hydraulic Profiling Location
- Slug Testing Location
- Vertically Averaged Hydraulic Conductivity from Hydraulic Profiling Contours
- Limits of Interpolation
- Former Philadelphia Refinery Area of Interest (AOI) Boundary
- 39 — Vertically Averaged Hydraulic Conductivity (ft/d)
- 7 — Hydraulic Conductivity (ft/d)

Vertically Averaged Hydraulic Conductivity from Hydraulic Profiling

(ft/d)

- 55 to 60
- 50 to 55
- 45 to 50
- 40 to 45
- 35 to 40
- 30 to 35
- 25 to 30
- 20 to 25

0 70 140 Feet

(At original document size of 22x34)
1:840

N

Stantec

Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Data Sources: Stantec
3. Depth to groundwater and LNAPL, where present, were measured in each well to the nearest one-hundredth of a foot using an interface probe.
4. FT NAVD88 = feet referenced to the North American Vertical Datum of 1988
5. ft/d = feet per day
6. Groundwater elevation data was interpolated using point kriging with a linear variogram model in Surfer to produce a surface model shown in rainbow color flooding. The model is interpreted to be a reasonable approximation of the unconfined aquifer elevation within the limits of the available well data.
7. Background: USGS Topo Layers (TMN): USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road data; Natural Earth Data; U.S. Department of State HIU; NOAA National Centers for Environmental Information. Data refreshed July, 2025.PEMA Philadelphia County 2022 Aerial.

Project Location
City of Philadelphia,
Philadelphia County, PA

Prepared by GWC on 2025-06-20
TR Review by ADK on 2025-07-15
IR Review by JKK on 2025-07-21

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

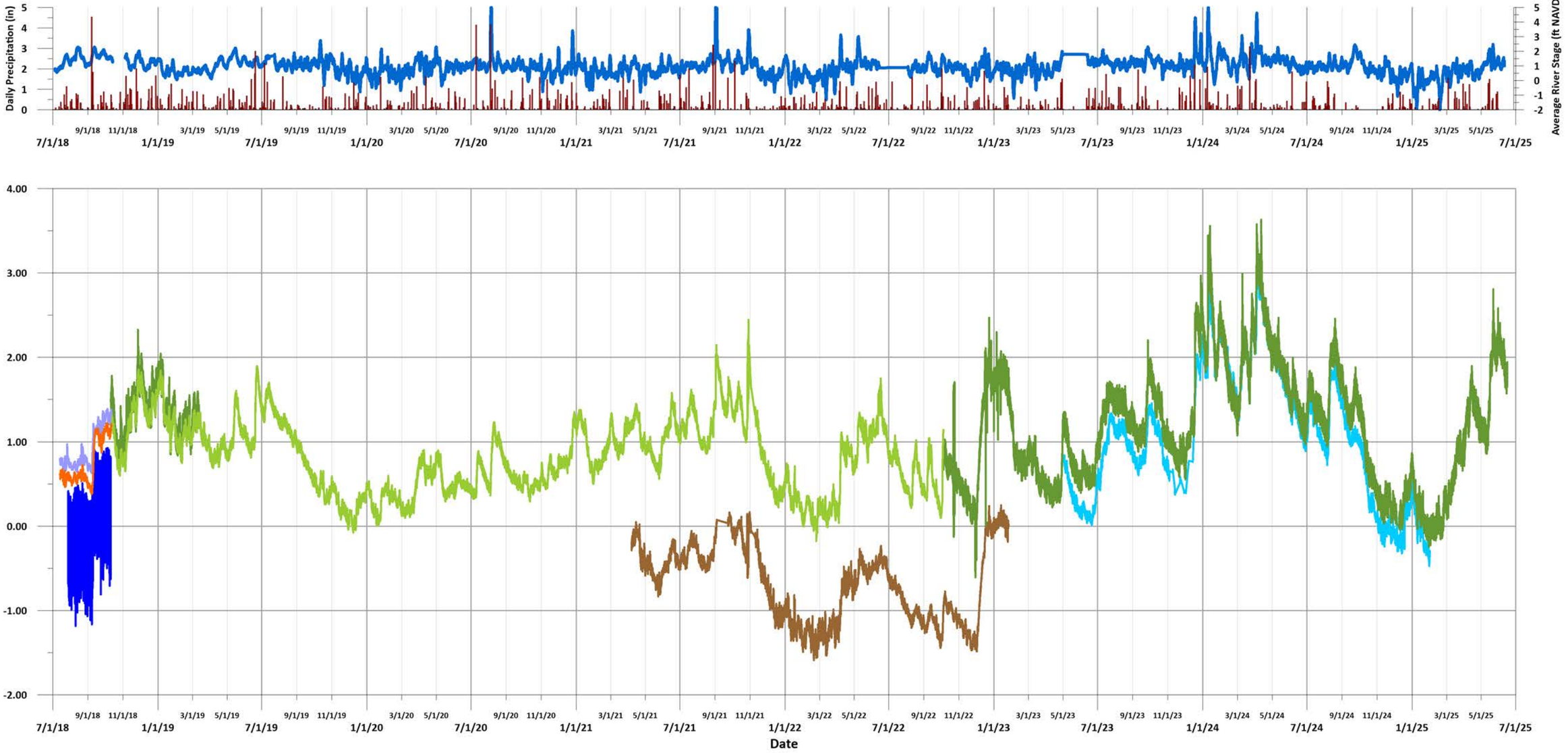
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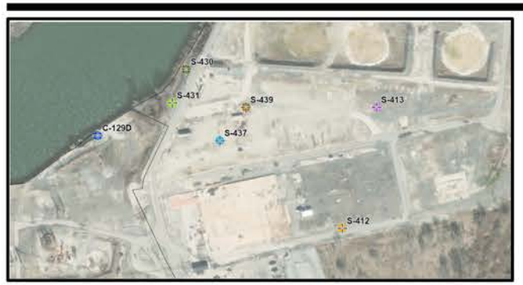
Figure No.
4-5

Title
Water-Table Hydraulic Conductivity Estimates from Slug Testing and Hydraulic Profiling

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Notes

1. Monitoring well water levels were continuously recorded using non-vented data loggers set to record water depth at 10 minute intervals. Water depths were compensated for barometric pressure using linear correction to synoptic measurements collected with a barometric data logger. Water depths were converted to water-level elevations using surveyed top of well casing elevations and were verified using manual water-level measurements. Water-level elevations are corrected for light, non-aqueous phase liquid (LNAPL) where present in wells.
2. River stage data obtained from the United States Geological Survey for Gage Station 01474501.
3. Precipitation data obtained from the NOAA National Center for Environmental Information (NCEI) for Philadelphia International Airport (PHL).
4. Aerial photograph obtained from the Pennsylvania Spatial Data Access (PASDA) internet mapping service.
5. FT NAVD 88 = feet referenced to the North American Vertical Datum of 1988
6. in = inches; ft = feet; hr = hour
7. AOI = Area of Interest; PBNY = Point Breeze North Yard; PBSY = Point Breeze South Yard

Upper Plot

- PHL Total Daily Precipitation (in)
- 12 Hour Running Average - Schuylkill River at 30th Street

Lower Plot

Water-Table Wells

- S-412
- S-439
- S-430
- S-413
- S-437
- S-431

Lower Aquifer Wells

- C-129D

Stantec

Project Location
Former PES Refinery
Philadelphia, Pennsylvania

195603450

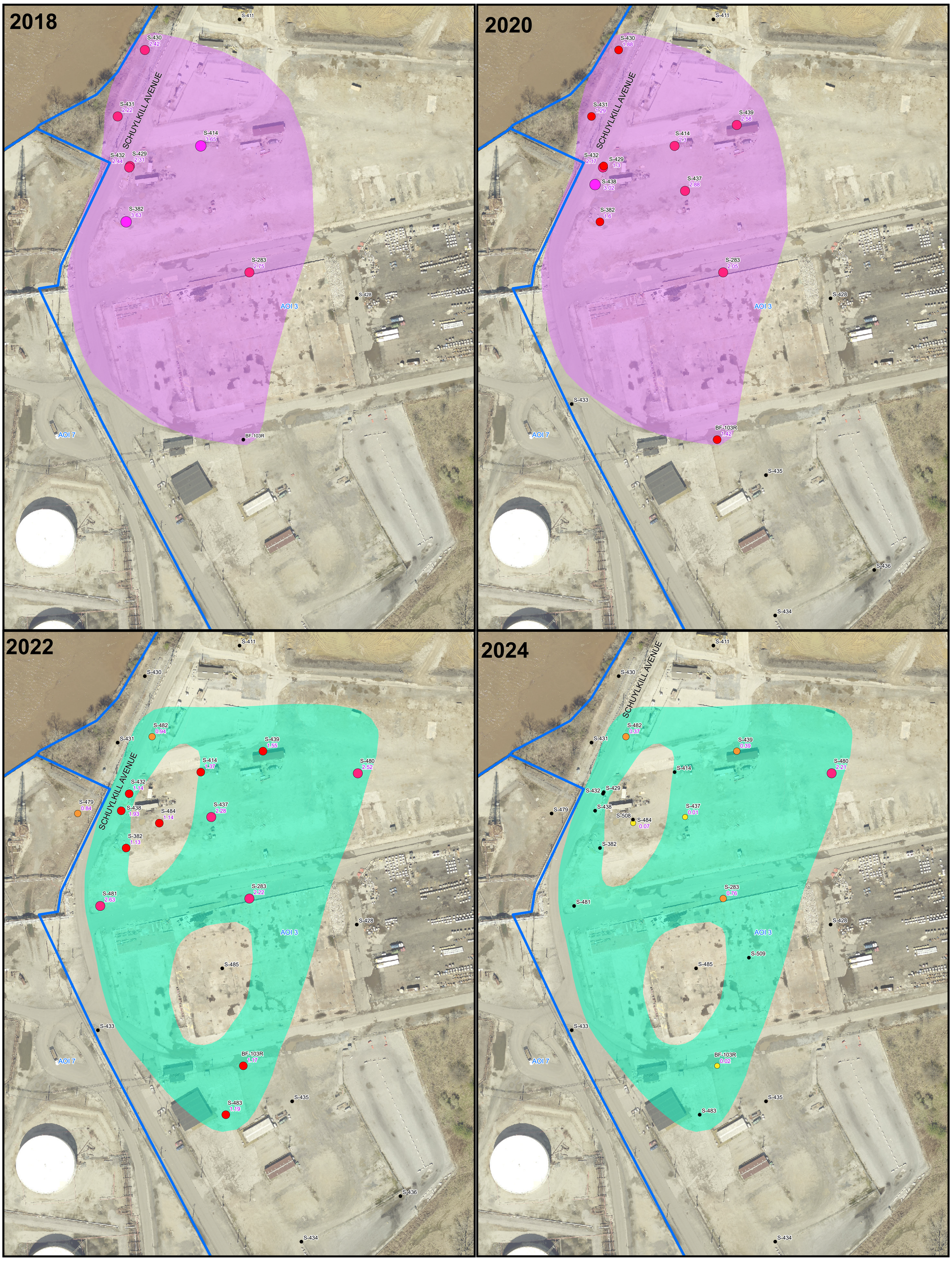
Prepared by ADK on 6/5/2025
Technical Review by JT on 6/12/2025
Independent Review by JK on 6/17/2025

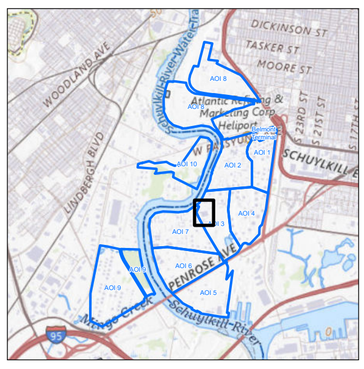
Client/Project
BELLWETHER DISTRICT HOLDINGS, LLC
3144 WEST PASSYUNK AVENUE
PHILADELPHIA, PA 19145

Figure No.
4-6

Title
UDEX RELEASE AREA WATER-LEVEL MONITORING DATA LOGGER HYDROGRAPHS

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Legend

Maximum LNAPL Thickness (feet)

- LNAPL - NOT DETECTED
- 0.01 - 0.10
- 0.10 - 1.00
- 1.00 - 2.00
- 2.00 - 3.00
- > 3.00

Estimated LNAPL Extent – June 2019

Refined LNAPL Extent – January 2022

Former Philadelphia Refinery Area of Interest (AOI) Boundary

1.62 Maximum LNAPL Thickness by Year (feet)

0 100 200 Feet

(At original document size of 22x34)
1:1,200

N

Stantec

Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Data Sources: Stantec
3. LNAPL = Light Non-Aqueous Phase Liquid
4. Background: USGS Topo Layers (TMN): USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road data; Natural Earth Data; U.S. Department of State HIU; NOAA National Centers for Environmental Information. Data refreshed July, 2025.PEMA Philadelphia County 2022 Aerial.

Project Location
City of Philadelphia,
Philadelphia County, PA

Prepared by GWC on 2025-05-29
TR Review by ADK on 2025-07-15
IR Review by JKK on 2025-07-21

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

195603450

Figure No.

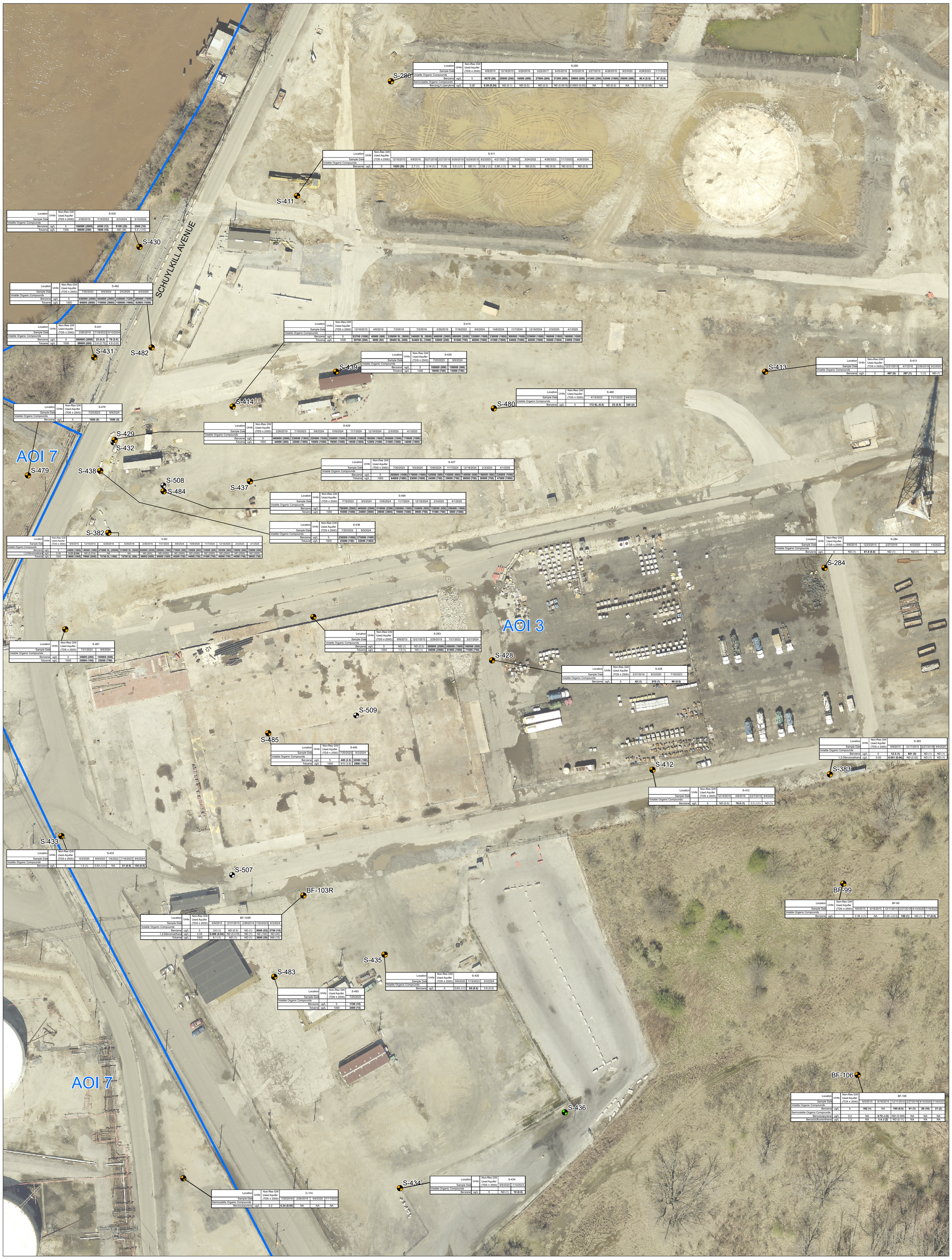
5-1

Title

LNAPL Characterization

\\us0245-ppfss01\shared_projects\195603450103_data\gis_cad\gis\PRO\udex_rir\udex_rir_sec5.aprx Revised: 2025-08-19 By: gcurry

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Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-280										
Sample Date			6/8/2015	12/16/2015	5/20/2016	5/22/2017	6/25/2018	6/25/2018	2/27/2019	6/26/2019	9/2/2020	4/28/2023	7/17/2023
Volatile Organic Compounds													
Benzene	ug/L	5	**6570 (50)**	**28500 (250)**	**16000 (500)**	**27000 (200)**	**37200 (500)**	**39900 (500)**	**41000 (200)**	**52000 (1000)**	**35000 (500)**	**90.4 (0.5)**	**97 (0.5)**
Semivolatile Organic Compounds													
Benzo(g,h,i)perylene	ug/L	0.26	**0.35 (0.24)**	ND (0.1)	ND (0.5)	ND (0.5)	ND (0.0515)	0.0563 (0.05)	NA	ND (0.5)	NA	0.135 (0.08)	NA

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-411											
Sample Date			12/16/2015	4/8/2016	6/27/2018	2/27/2019	6/26/2019	10/29/2019	9/2/2020	4/27/2021	1/5/2022	3/24/2022	4/28/2023	7/17/2023	4/26/2024
Volatile Organic Compounds															
Benzene	ug/L	5	**1020 (25)**	2.7 (1)	3.14 (1)	**7 (1)**	0.9 J (1)	ND (1)	0.58 J (1)	0.99 J (1)	NA	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-430			
Sample Date			2/26/2019	7/18/2023	6/3/2024	9/10/2024
Volatile Organic Compounds						
Benzene	ug/L	5	**160000 (2000)**	**4200 (12)**	**9100 (25)**	**2500 (10)**
Toluene	ug/L	1000	**59000 (200)**	**1800 (19)**	ND (38)	5.4 J (15)

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-482			
Sample Date			7/20/2023	9/9/2024	2/4/2025	4/2/2025
Volatile Organic Compounds						
Benzene	ug/L	5	**430000 (2500)**	**600000 (2000)**	**420000 (1200)**	**260000 (1000)**
Toluene	ug/L	1000	**65000 (3800)**	**110000 (3000)**	**100000 (1900)**	**82000 (1500)**

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-431		
Sample Date			2/26/2019	7/18/2023	9/10/2024
Volatile Organic Compounds					
Benzene	ug/L	5	**590000 (2000)**	**23 (0.5)**	**78 (2.5)**
Toluene	ug/L	1000	**59000 (200)**	3.9 (0.75)	4.9 (3.8)

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-414										
Sample Date			12/16/2015	4/8/2016	7/2/2018	7/2/2018	2/26/2019	7/18/2023	9/5/2024	10/8/2024	11/7/2024	12/18/2024	2/3/2025	4/1/2025
Volatile Organic Compounds														
Benzene	ug/L	5	**93700 (1000)**	**48900 (500)**	**255000 SL (5000)**	**249000 SL (5000)**	**460000 (2000)**	**450000 (2500)**	**3300000 (1000)**	**230000 (1000)**	**300000 (1000)**	**220000 (1000)**	**160000 (1000)**	**160000 (1000)**
Toluene	ug/L	1000	**30700 (250)**	**4980 (50)**	**39400 SL (500)**	**54400 SL (1000)**	**55000 (200)**	**61000 (750)**	**40000 (1500)**	**41000 (1500)**	**54000 (1500)**	**42000 (1500)**	**35000 (1500)**	**33000 (1500)**

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-439	
Sample Date			7/20/2023	9/9/2024
Volatile Organic Compounds				
Benzene	ug/L	5	**180000 (500)**	**150000 (500)**
Toluene	ug/L	1000	**18000 (750)**	**13000 (750)**

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-413			
Sample Date			12/21/2015	4/7/2016	2/26/2019	9/2/2020
Volatile Organic Compounds						
Benzene	ug/L	5	**487 (5)**	**267 (1)**	1 (1)	ND (1)

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-480		
Sample Date			4/14/2022	7/21/2023	9/6/2024
Volatile Organic Compounds					
Benzene	ug/L	5	**172 SL (0.5)**	**23 (0.5)**	**320 (2)**

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-479	
Sample Date			7/25/2023	9/9/2024
Volatile Organic Compounds				
Benzene	ug/L	5	**1000 (5)**	**1000 (5)**

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-429							
Sample Date			2/26/2019	7/18/2023	9/6/2024	10/8/2024	11/7/2024	12/19/2024	2/3/2025	4/1/2025
Volatile Organic Compounds										
Benzene	ug/L	5	**480000 (2000)**	**230000 (1000)**	**220000 (1000)**	**250000 (1000)**	**220000 (1000)**	**180000 (1000)**	**200000 (1000)**	**170000 (1000)**
Toluene	ug/L	1000	**44000 (200)**	**32000 (1800)**	**16000 (1500)**	**19000 (1500)**	**14000 (1500)**	**12000 (1500)**	**21000 (1500)**	**14000 (1500)**

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-437							
Sample Date			7/20/2023	9/5/2024	10/8/2024	11/7/2024	12/18/2024	2/3/2025	4/1/2025	
Volatile Organic Compounds										
Benzene	ug/L	5	**260000 (1000)**	**170000 (1000)**	**120000 (500)**	**130000 (500)**	**140000 (500)**	**150000 (500)**	**230000 (1000)**	
Toluene	ug/L	1000	**64000 (1500)**	**23000 (1500)**	**24000 (750)**	**29000 (750)**	**28000 (750)**	**30000 (750)**	**47000 (1500)**	

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-484						
Sample Date			7/19/2023	9/5/2024	10/8/2024	11/7/2024	12/18/2024	2/3/2025	4/1/2025
Volatile Organic Compounds									
Benzene	ug/L	5	**780000 (2500)**	**480000 (2500)**	**510000 (2500)**	**280000 (1000)**	**150000 (500)**	**120000 (500)**	**200000 (1000)**
Toluene	ug/L	1000	**18000 (1500)**	**24000 (3800)**	**29000 (3800)**	**19000 (1500)**	**9900 (750)**	**11000 (750)**	**5800 (1500)**

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-438	
Sample Date			7/20/2023	9/9/2024
Volatile Organic Compounds				
Benzene	ug/L	5	**230000 (1000)**	**270000 (1000)**
Toluene	ug/L	1000	**23000 (150)**	**22000 (1500)**

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-382										
Sample Date			6/9/2015	12/16/2015	6/29/2018	6/29/2018	2/26/2019	7/21/2023	9/6/2024	10/8/2024	11/7/2024	12/18/2024	2/3/2025	4/1/2025
Volatile Organic Compounds														
Benzene	ug/L	5	**48800 (1000)**	**146000 (1000)**	**478000 SL (25000)**	**515000 SL (5000)**	**580000 (2000)**	**200000 (1000)**	**170000 (500)**	**120000 (500)**	**130000 (500)**	**150000 (500)**	**130000 (500)**	**120000 (500)**
1,2-Dibromoethane	ug/L	0.05	**0.23 (0.04)**	ND (0.019)	NA	NA	ND (200)	ND (40000)	ND (2000)	ND (2000)	ND (2000)	ND (2000)	ND (2000)	ND (2000)
Toluene	ug/L	1000	**19800 (1000)**	**79600 (2000)**	**75700 SL (1000)**	**70700 SL (500)**	**69000 (2500)**	**69000 (1500)**	**48000 (750)**	**44000 (750)**	**51000 (750)**	**48000 (750)**	**44500 (750)**	**39000 (750)**

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-481	
Sample Date			7/21/2023	9/9/2024
Volatile Organic Compounds				
Benzene	ug/L	5	**35000 (250)**	**150000 (500)**
Toluene	ug/L	1000	**25000 (150)**	**23000 (750)**

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-283				
Sample Date			6/8/2015	12/21/2015	2/26/2019	7/21/2023	5/31/2024
Volatile Organic Compounds							
Benzene	ug/L	5	ND (1)	ND (0.5)	**380000 (2000)**	**300000 (1000)**	**160000 (500)**
Toluene	ug/L	1000	1.9 (1)	ND (1)	**84000 (2000)**	**51000 (1500)**	**71000 (750)**

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-428		
Sample Date			2/27/2019	9/3/2020	7/18/2023
Volatile Organic Compounds					
Benzene	ug/L	5	**42 (1)**	**210 (1)**	**98 (0.5)**

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-284				
Sample Date			6/8/2015	12/23/2015	2/27/2019	9/3/2020	1/5/2022
Volatile Organic Compounds							
Benzene	ug/L	5	ND (1)	**61.8 (0.5)**	ND (1)	ND (1)	NA

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-485	
Sample Date			7/20/2023	6/3/2024
Volatile Organic Compounds				
Benzene	ug/L	5	**400 (2.5)**	**32000 (100)**
Toluene	ug/L	1000	810 (3.8)	**2800 (150)**

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-383			
Sample Date			6/9/2015	12/17/2015	2/27/2019	9/9/2020
Volatile Organic Compounds						
Benzene	ug/L	5	**12.3 (1)**	**651 (5)**	ND (1)	ND (1)
1,2-Dibromoethane	ug/L	0.05	**0.051 (0.04)**	ND (0.02)	ND (1)	ND (1)

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-412			
Sample Date			12/14/2015	4/8/2016	2/27/2019	9/9/2020
Volatile Organic Compounds						
Benzene	ug/L	5	ND (0.5)	**76.5 (1)**	0.3 J (1)	ND (1)

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-433				
Sample Date			9/3/2020	9/9/2020	1/6/2022	7/18/2023	9/9/2024
Volatile Organic Compounds							
Benzene	ug/L	5	1.2 (1)	0.53 J (1)	NA	**21 (0.5)**	**130 (0.5)**

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	BF-103R				
Sample Date			6/9/2015	12/31/2015	2/26/2019	7/20/2023	6/3/2024
Volatile Organic Compounds							
Benzene	ug/L	5	3.6 (1)	ND (0.5)	ND (1)	**8000 (25)**	**2700 (10)**
1,2-Dibromoethane	ug/L	0.05	**0.086 (0.04)**	ND (0.019)	ND (1)	ND (100)	ND (40)
Toluene	ug/L	1000	6.1 (1)	ND (1)	ND (1)	**2600 (38)**	890 (15)

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	BF-99					
Sample Date			6/5/2015	6/16/2015	12/11/2015	2/27/2019	9/10/2020	7/19/2023
Volatile Organic Compounds								
Benzene	ug/L	5	0.38 J (1)	NA	0.26 J (0.5)	**100 (1)**	ND (1)	**17 (0.5)**

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-435		
Sample Date			9/9/2020	7/19/2023	6/3/2024
Volatile Organic Compounds					
Benzene	ug/L	5	0.63 J (1)	**55 (0.5)**	3.8 (0.5)

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-483	
Sample Date			7/25/2023	
Volatile Organic Compounds				
Benzene	ug/L	5	**1100 (10)**	
Toluene	ug/L	1000	**2400 (15)**	

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	BF-106					
Sample Date			6/5/2015	6/16/2015	12/11/2015	2/27/2019	9/10/2020	7/19/2023
Volatile Organic Compounds								
Benzene	ug/L	5	**162 (1)**	NA	**195 (0.5)**	**91 (1)**	**20 (10)**	**21 (2)**
Semivolatile Organic Compounds								
Benzo(a)pyrene	ug/L	0.2	NA	**0.72 J (2)**	ND (0.056)	NA	NA	NA
Benzo(b)fluoranthene	ug/L	1.2	NA	**1.4 J (2)**	ND (0.11)	NA	NA	NA

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	C-174			
Sample Date			7/20/2016	2/26/2019	9/9/2020	7/17/2023
Semivolatile Organic Compounds						
Benzo(a)pyrene	ug/L	0.2	**0.24 (0.05)**	NA	NA	NA

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-434	
Sample Date			9/9/2020	7/19/2023
Volatile Organic Compounds				
Benzene	ug/L	5	ND (1)	**19 (0.5)**

Legend

- No Groundwater Exceedance of the PADEP Non-Residential, Used Aquifer SHS
- Groundwater Exceedance of the PADEP Non-Residential, Used Aquifer SHS
- Monitoring Well
- Recovery Well
- Former Philadelphia Refinery Area of Interest (AOI) Boundary

73(2.2)	Boldfaced concentrations exceed the Non-Res GW Used Aquifer (TDS ≤ 2500) MSC (laboratory Reporting Limits indicated in parentheses)
NA	Not Analyzed
ND	Not Detected
J	Estimated Concentration
B	Analyte found in associated blank
SL	Sample collected from below light non-aqeuous phase liquid (LNAPL)

Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Data Sources: Stantec
3. PADEP = Pennsylvania Department of Environmental Protection; SHS = Statewide Health Standard; MSC = Medium Specific Concentration; GW = groundwater; Non-Res = Non-Residential; TDS = total dissolved solids; ug/L = micrograms per liter
4. Background: USGS Topo Layers (TMN): USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road data; Natural Earth Data; U.S. Department of State HIU; NOAA National Centers for Environmental Information. Data refreshed July, 2025.PEMA Philadelphia County 2022 Aerial.

0 60 120 Feet
(At original document size of 22x34)
1:720

N

Stantec

Project Location
City of Philadelphia,
Philadelphia County, PA

Prepared by GWC on 2025-05-29
TR Review by ADK on 2025-07-15
IR Review by JKK on 2025-07-21

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

195603450

Figure No.
6-1

Title
Groundwater SHS Exceedances, Unconfined Aquifer

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SCHUYLKILL RIVER

SCHUYLKILL AVENUE

S-280D

S-430

S-482

S-431

S-439

S-414

S-432

S-429

S-438

S-508

S-484

S-437

S-479

C-129D

S-382

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-284D								
Sample Date			6/9/2015	12/23/2015	2/26/2019	6/19/2019	10/28/2019	9/1/2020	4/23/2021	7/21/2021	4/4/2022	4/26/2023
Volatile Organic Compounds												
Benzene	ug/L	5	**7.9 (1)**	**62 (0.5)**	0.3 J (1)	ND (1)	0.3 J (1)	ND (1)	**10 (1)**	NA	ND (0.5)	ND (0.5)
1,2-Dibromoethane	ug/L	0.05	**0.057 (0.04)**	ND (0.019)	ND (1)	ND (0.029)	ND,XQ (0.028)	ND (1)	ND (0.029)	NA	ND (0.02)	ND (0.021)

S-284

S-284D

AOI 3

S-428

S-509

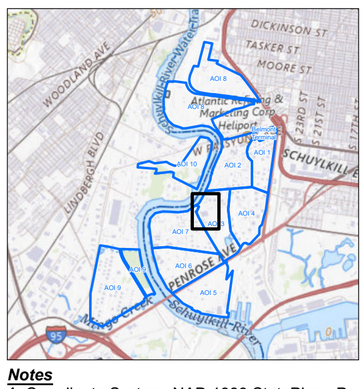
Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-507
Sample Date			7/17/2023
Volatile Organic Compounds			
Benzene	ug/L	5	**16 (0.5)**

S-507

S-69D

Location	Units	Non-Res GW Used Aquifer (TDS ≤ 2500)	S-69D									
Sample Date			6/9/2015	12/21/2015	2/26/2019	6/26/2019	10/29/2019	9/1/2020	4/26/2021	7/21/2021	4/5/2022	4/26/2023
Volatile Organic Compounds												
Benzene	ug/L	5	**5.1 (1)**	**338 (5)**	ND (1)	ND (1)	ND (1)	ND (1)	0.43 J (1)	NA	ND (0.5)	3.4 (0.5)
1,2-Dibromoethane	ug/L	0.05	**0.08 (0.04)**	ND (0.018)	ND (1)	ND (0.028)	ND,XQ (0.028)	ND (1)	ND (0.029)	NA	ND (0.02)	ND (0.022)

AOI 7



Legend

- No Groundwater Exceedance of the PADEP Non-Residential, Used Aquifer SHS
- Groundwater Exceedance of the PADEP Non-Residential, Used Aquifer SHS
- Monitoring Well
- Recovery Well
- Former Philadelphia Refinery Area of Interest (AOI) Boundary

73(2.2) Boldfaced concentrations exceed the Non-Res GW Used Aquifer (TDS ≤ 2500) MSC (laboratory Reporting Limits indicated in parentheses)

NA Not Analyzed

ND Not Detected

J Estimated Concentration

B Analyte found in associated blank

0 70 140 Feet
(At original document size of 22x34)
1:840

N

Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Data Sources: Stantec
3. PADEP = Pennsylvania Department of Environmental Protection; SHS = Statewide Health Standard; MSC = Medium Specific Concentration; GW = groundwater; Non-Res = Non-Residential; TDS = total dissolved solids; ug/L = micrograms per liter
4. Background: USGS Topo Layers (TMN): USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road data; Natural Earth Data; U.S. Department of State HIU; NOAA National Centers for Environmental Information. Data refreshed July, 2025.PEMA Philadelphia County 2022 Aerial.

Stantec

Project Location
City of Philadelphia,
Philadelphia County, PA

Prepared by GWC on 2025-05-29
TR Review by ADK on 2025-07-15
IR Review by JKK on 2025-07-21

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

195603450

Figure No.
6-2

Title
Groundwater SHS Exceedances, Lower Aquifer

\\us0245-ppfss01\shared_projects\195603450\03_data\gis_cad\gis\PRO\udex_ir\udex_rir_sec6.aprx Revised: 2025-08-19 By: gcurry

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Figure No.
9-1

Title

COMPARISON OF BASELINE AND UPDATED MODEL HORIZONTAL HYDRAULIC CONDUCTIVITY - LAYER 1

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

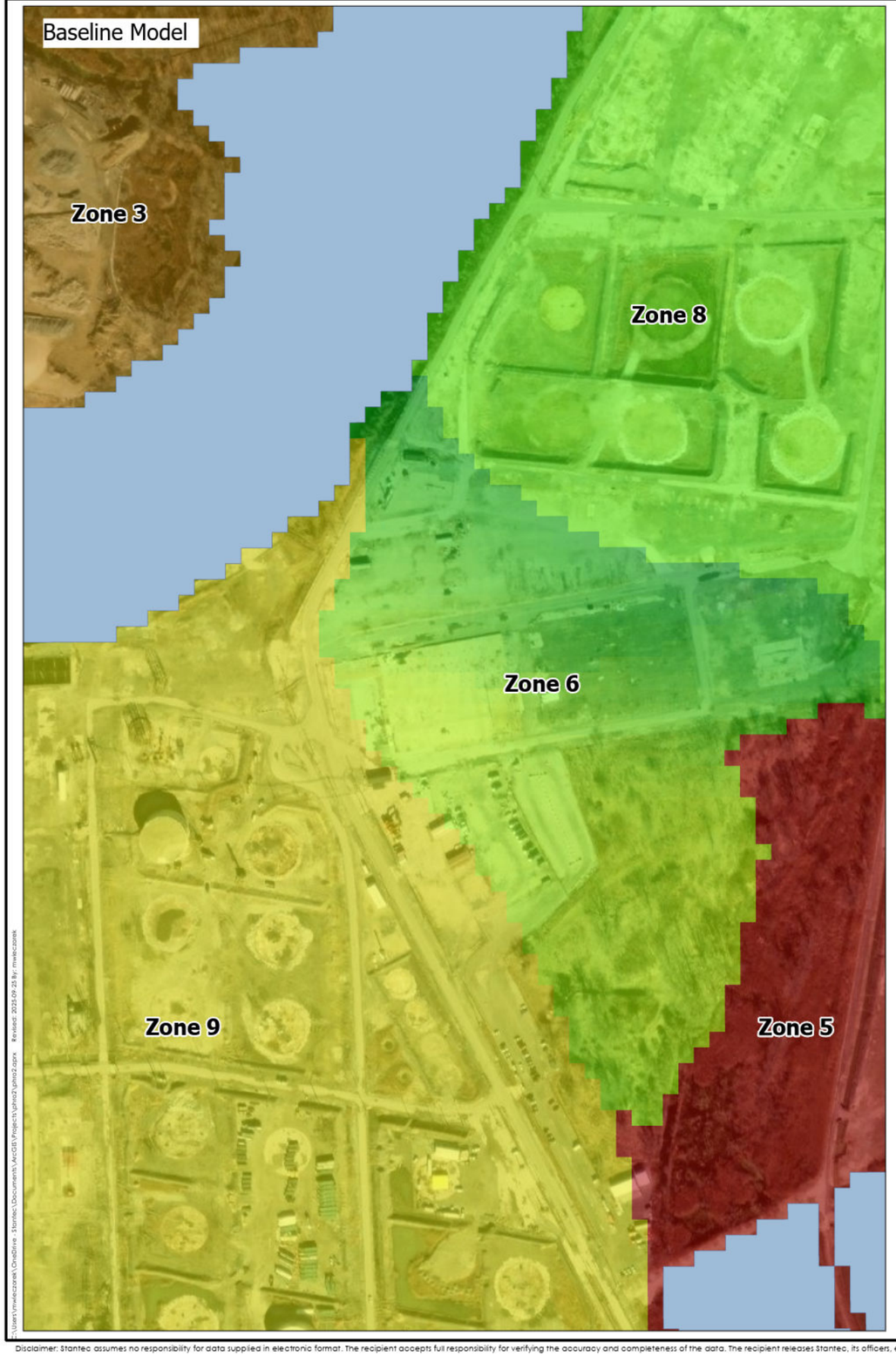
Project Location:
City of Philadelphia, Pennsylvania

213403039
Prepared by MCW on 9/25/2025
Technical Review by JT on 9/25/2025
Independent Review by AK on 9/25/2025

0 340 680 Feet
1:5,298 (At Original document size of 11x17)

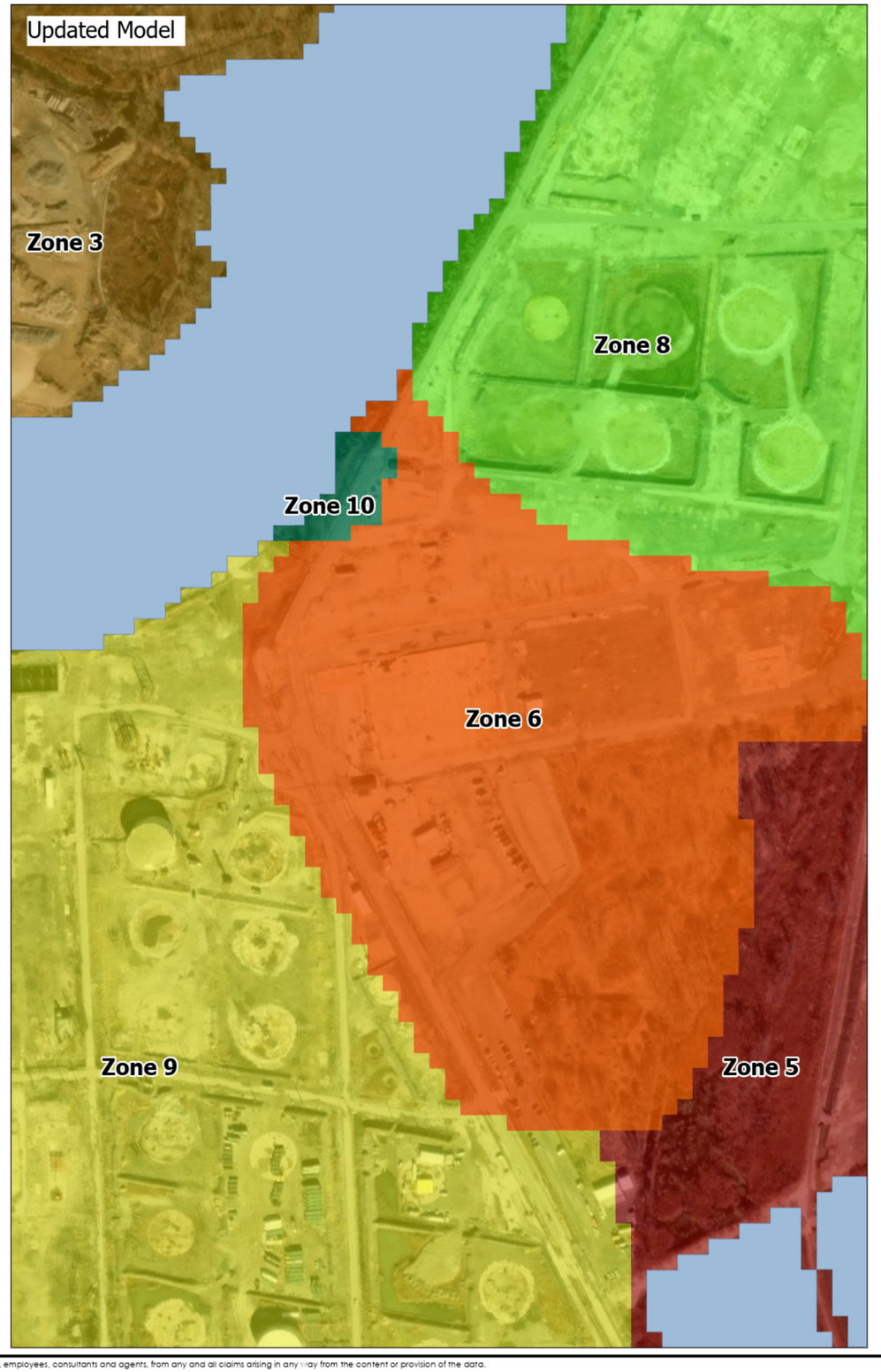
N

Baseline Model

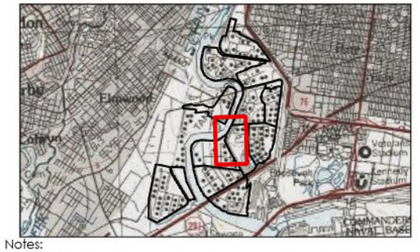


- River Boundary
- Zone 3: Kx=1.02E+01 Kz=1.02E+00
- Zone 5: Kx=6.00E-02 Kz=7.73E-03
- Zone 6
  - 6.1
  - 100
- Zone 8: Kx=2.43E+02 Kz=2.56E+01
- Zone 9: Kx=5.51E-03 Kz=5.51E-03

Updated Model



- Zone 3: Kx=1.02E+01 Kz=1.20E+00
- Zone 5: Kx=6.00E-02 Kz=7.72E-03
- Zone 6
  - 6.1
  - 100
- Zone 8: Kx=2.43E+02 Kz=2.56E+01
- Zone 9: Kx=5.51E+-03 Kz=5.51E-03
- Zone 10: Kx=4.50E+01 Kx=1.00E+01



Notes:
1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere; FT NAVD88 = feet referenced to the North American Vertical Datum of 1988
2. Sources: Stantec
3. Service Layer Credits: USA Topo Maps: Copyright:© 2013 National Geographic Society, i-cubed
World Imagery: Maxar

Stantec

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Figure No.
9-2a

Title
SIMULATED POTENTIOMETRIC SURFACE - LAYER 1

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia,
Pennsylvania

213403039
Prepared by NCW on 9/26/2025
Technical Review by JT on 9/26/2025
Independent Review by AK on 9/26/2025

0 325 650 Feet
1:5,000 (At Original document size of 11x17)

N

River Boundary

Layer 1 Simulated Potentiometric Surface
FT NAVD88
- 8 - 10
- 6 - 8
- 4 - 6
- 2 - 4
- 0 - 2
- -2 - 0
- -4 - -2
- -6 - -4
- -8 - -6

Layer 1 Simulated Potentiometric Contours- 2 ft Intervals



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet: ft = feet
2. Sources: Stantec
3. Service Layer Credits: USA Topo Maps: Copyright:© 2013 National Geographic Society, i-cubed
World Imagery: Maxar

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Figure No.
9-2b

Title
SIMULATED POTENTIOMETRIC SURFACE - LAYER 3

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia,
Pennsylvania

213403039
Prepared by MCW on 9/26/2025
Technical Review by JT on 9/26/2025
Independent Review by AK on 9/26/2025

0 325 650 Feet
1:5,000 (At Original document size of 11x17)

N

River Boundary

Layer 3 Simulated Potentiometric Surface
FT NAVD88
- 8 - 10
- 6 - 8
- 4 - 6
- 2 - 4
- 0 - 2
- -2 - 0
- -4 - -2
- -6 - -4
- -8 - -6

Layer 3 Simulated Potentiometric Contours- 2 ft Intervals



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet: ft = feet
2. Sources: Stantec
3. Service Layer Credits: USA Topo Maps: Copyright:© 2013 National Geographic Society, i-cubed
World Imagery: Maxar

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Figure No.
9-2c

Title
SIMULATED POTENTIOMETRIC SURFACE - LAYER 5

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia,
Pennsylvania

213403039
Prepared by MCW on 9/26/2025
Technical Review by JT on 9/26/2025
Independent Review by AK on 9/26/2025

0 325 650 Feet
1:5,000 (At Original document size of 11x17)

N

River Boundary

Layer 5 Simulated Potentiometric Surface
FT NAVD88
- 8 - 10
- 6 - 8
- 4 - 6
- 2 - 4
- 0 - 2
- -2 - 0
- -4 - -2
- -6 - -4
- -8 - -6

Layer 5 Simulated Potentiometric Contours- 2 ft Interval



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet: ft = feet
2. Sources: Stantec
3. Service Layer Credits: USA Topo Maps: Copyright:© 2013 National Geographic Society, i-cubed
World Imagery: Maxar

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Figure No.
9-2d

Title
SIMULATED POTENTIOMETRIC SURFACE - LAYER 7

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia,
Pennsylvania

213403039
Prepared by MCW on 9/26/2025
Technical Review by JT on 9/26/2025
Independent Review by AK on 9/26/2025

0 325 650 Feet
1:5,000 (At Original document size of 11x17)

N

River Boundary

Layer 7 Simulated Potentiometric Surface
FT NAVD88
- 8 - 10
- 6 - 8
- 4 - 6
- 2 - 4
- 0 - 2
- -2 - 0
- -4 - -2
- -6 - -4
- -8 - -6

Layer 7 Simulated Potentiometric Contours- 2 ft Interval



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet: ft = feet
2. Sources: Stantec
3. Service Layer Credits: USA Topo Maps: Copyright:© 2013 National Geographic Society, i-cubed
World Imagery: Maxar

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Figure No.
9-3a

Title
CALIBRATION WELL (TARGET) RESIDUAL PLOT (BUBBLE PLOT) - LAYER 1

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213409039
Prepared by MCW on 9/25/2025
Technical Review by JT on 9/25/2025
Independent Review by AK on 9/25/2025

0 130 260 Feet
1:2,000 (At Original document size of 11x17)

N

Layer 1 Wells

Residual (feet)

- -10 to -7.5
- -7.5 to -5.0
- -5.0 to -2.5
- -2.5 to 0
- 0 to 2.5
- 2.5 to 5.0
- 5.0 to 7.5
- 7.5 to 10
- > 10
- River Boundary



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet: ft = feet
2. Sources: Stantec
3. Service Layer Credits: USA Topo Maps: Copyright:© 2013 National Geographic Society, i-cubed
World Imagery (Clarity): Source: Esri, Maxar, Earthstar Geographics, IGN, and the GIS User Community

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Figure No.
9-3b

Title
CALIBRATION WELL (TARGET) RESIDUAL PLOT (BUBBLE PLOT) - LAYERS 5 to 7

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia,
Pennsylvania

213403039
Prepared by MCW on 9/25/2025
Technical Review by JT on 9/25/2025
Independent Review by AK on 9/25/2025

0 130 260 Feet
1:2,000 (At Original document size of 11x17)

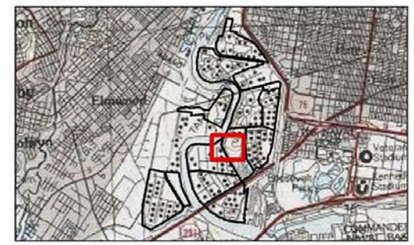
N

S-508
S-509
S-507

Layer 5 to 7 Wells

Residual (feet)

- -10 to -7.5
- -7.5 to -5.0
- -5.0 to -2.5
- -2.5 to 0
- 0 to 2.5
- 2.5 to 5.0
- 5.0 to 7.5
- 7.5 to 10
- > 10
- River Boundary



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet: ft = feet
2. Sources: Stantec
3. Service Layer Credits: USA Topo Maps: Copyright:© 2013 National Geographic Society, i-cubed
World Imagery (Clarity): Source: Esri, Maxar, Earthstar Geographics, IGN, and the GIS User Community

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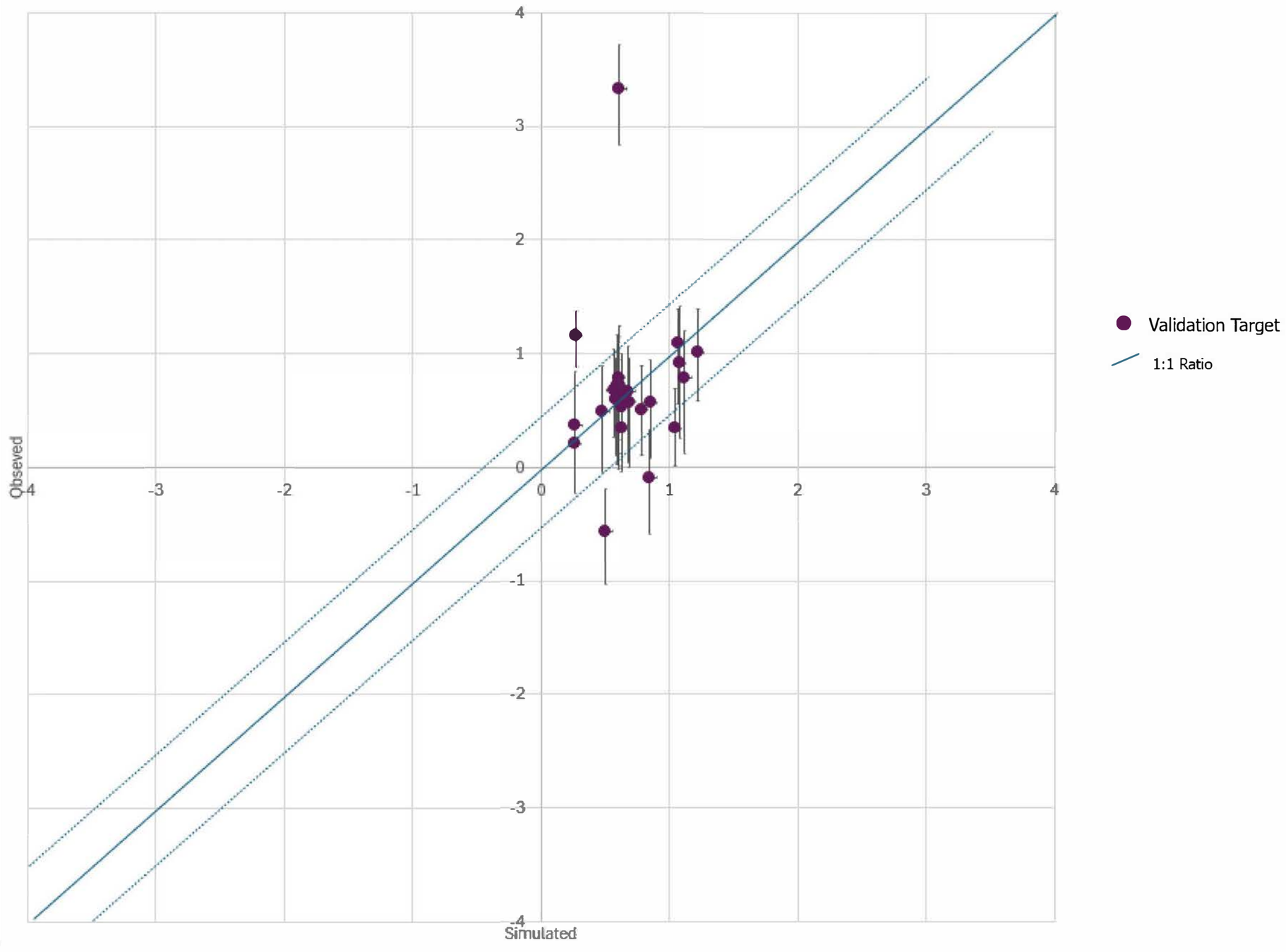


Figure No.
9-4

Title
CALIBRATION OBSERVED VERSUS SIMULATED CHART (LAYERS 1-3)

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213403039
Prepared by I-HCW on 9/26/2025
Technical Review by JT on 9/26/2025
Independent Review by AK on 9/26/2025

Notes:
1. Sources: Stantec
2. GWF Model simulated and observed hydraulic heads from well gauging measurements are provided in units of feet (ft).
3. Whiskers show range of second through third quartiles of observations from data record.

Stantec

C:\Users\jtrevenen\OneDrive - Stantec\Documents\ArcGIS\Projects\phase2.aprx Revised: 2025-09-24 By: jtrevenen

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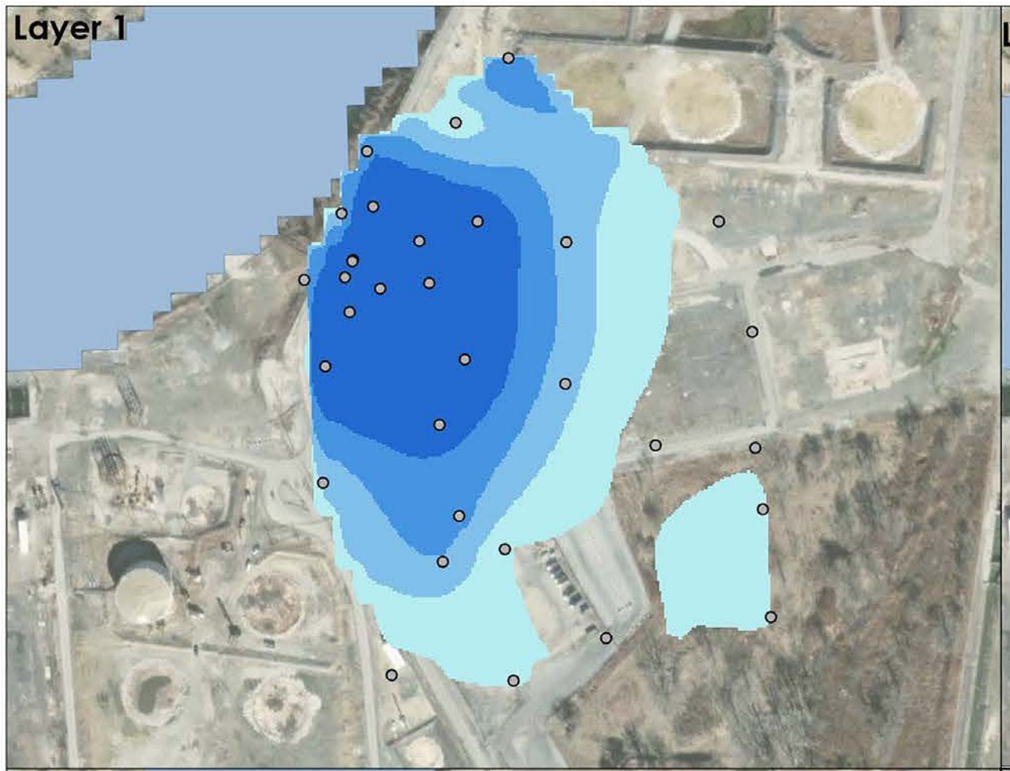
Figure No.
9-5a

Title
MODEL INITIAL CONCENTRATIONS - BENZENE

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

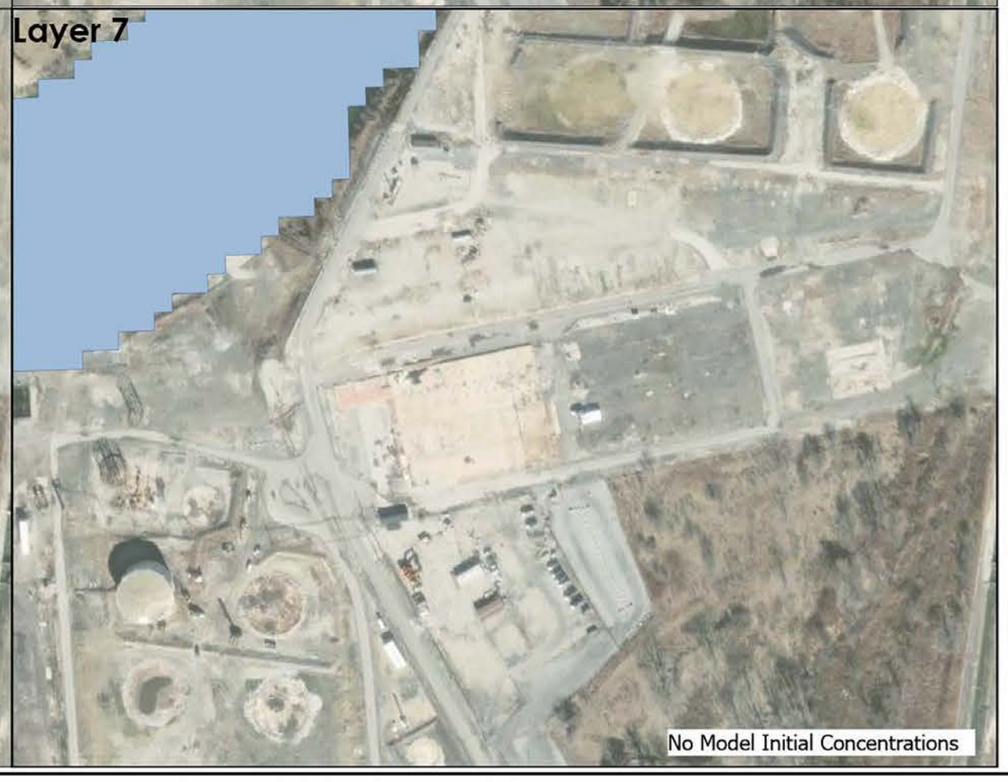
Project Location:
City of Philadelphia,
Pennsylvania

213403039
Prepared by MCW on 9/25/2025
Technical Review by JT on 9/25/2025
Independent Review by AK on 9/25/2025









0 260 520 Feet
1:4,000 (At Original document size of 11x17)

N

Legend

Benzene Dissolved Phase Distribution (ug/L)

- 0-5 (no color)
- 5 - 100
- 100 - 1,000
- 1,000 - 10,000
- 10,000 - 100,000
- >100,000
- River Boundary
- Well Locations Used in Estimation



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: USA Topo Maps: Copyright© 2013 National Geographic Society, i-cubed
World Imagery: Maxar, Microsoft
4. ug/L = micrograms per liter

Stantec

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Figure No.
9-5b

Title
MODEL INITIAL CONCENTRATIONS- TOLUENE

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213403039
Prepared by MCW on 9/25/2025
Technical Review by JT on 9/25/2025
Independent Review by AK on 9/25/2025









0 325 650 Feet
1:5,000 (At Original document size of 11x17)

N

Toluene Dissolved Phase Distribution (ug/L)

- 0 - 1,000 (no color)
- 1,000 - 10,000
- 10,000- 100,000
- >100,000
- Source Area (ug/L)
- River Boundary
- Well Locations Used in Estimation



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: USA Topo Maps: Copyright:© 2013 National Geographic Society, i-cubed
World Imagery: Maxar, Microsoft
World Imagery: Maxar
4. ug/L = micrograms per liter

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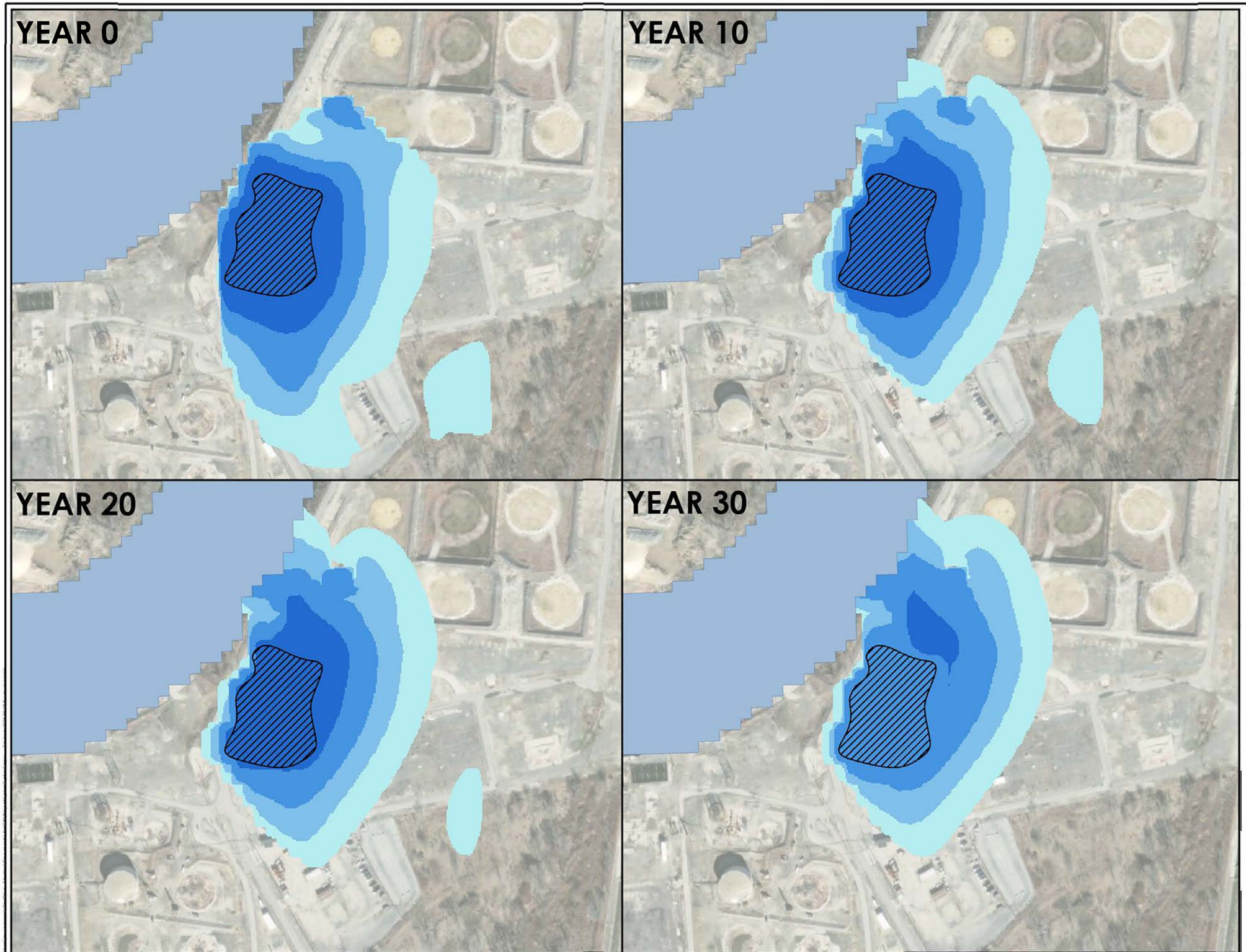


Figure No.
9-6

Title
SIMULATED BENZENE DISTRIBUTION OVER 30 YEARS-WATER TABLE

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213403039
Prepared by MCW on 9/25/2025
Technical Review by JT on 9/25/2025
Independent Review by AK on 9/25/2025

0 262.5 525 Feet
1:4000 (At Original document size of 11x17)

N

Source Area (ug/L)

Benzene Dissolved Phase Distribution (ug/L)

- 0-5 (no color)
- 5 - 100
- 100 - 1,000
- 1,000 - 10,000
- 10,000 - 100,000
- >100,000
- River Boundary



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: USA Topo Maps: Copyright© 2013 National Geographic Society, i-cubed
World Imagery: Maxar, Microsoft
4. ug/L = micrograms per liter

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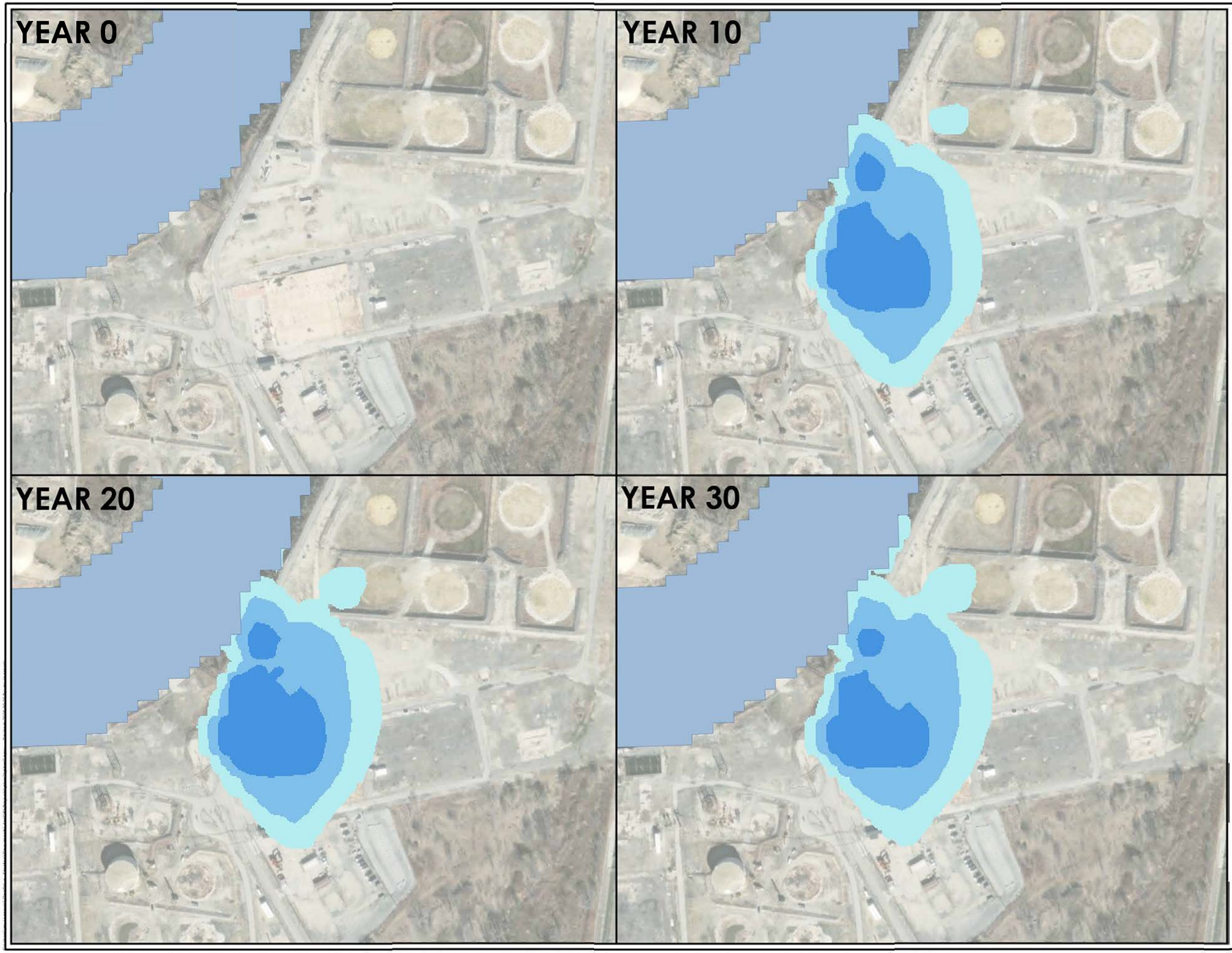


Figure No.
9-7

Title
SIMULATED BENZENE DISTRIBUTION OVER 30 YEARS-UPPER SAND

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213403039
Prepared by MCW on 9/25/2025
Technical Review by JT on 9/25/2025
Independent Review by AK on 9/25/2025

0 265 530 Feet
1:4000 (At Original document size of 11x17)

N

Benzene Dissolved Phase Distribution (ug/L)

- 0-5 (no color)
- 5 - 100
- 100 - 1,000
- 1,000 - 10,000
- 10,000 - 100,000
- >100,000
- River Boundary



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: USA Topo Maps: Copyright:© 2013 National Geographic Society, i-cubed
World Imagery: Maxar, Microsoft
World Imagery: Maxar
4. ug/L = micrograms per liter

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Figure No.
9-8

Title
SIMULATED BENZENE DISTRIBUTION OVER 30 YEARS-LOWER AQUIFER MIDDLE SAND

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213403039
Prepared by MCW on 9/26/2025
Technical Review by JT on 9/26/2025
Independent Review by AK on 9/26/2025

0 250 500 Feet
1:4000 (At Original document size of 11x17)

N

Benezene Dissolved Phase Distribution (ug/L)

- 0-5 (no color)
- 5 - 100
- 100 - 1,000
- 1,000 - 10,000
- 10,000 - 100,000
- >100,000
- River Boundary



Notes:
1. Coordinate System: NAD 1983 State Plane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: USA Topo Maps: Copyright:© 2013 National Geographic Society, i-cubed
World Imagery: Maxar, Microsoft
4. ug/L = micrograms per liter

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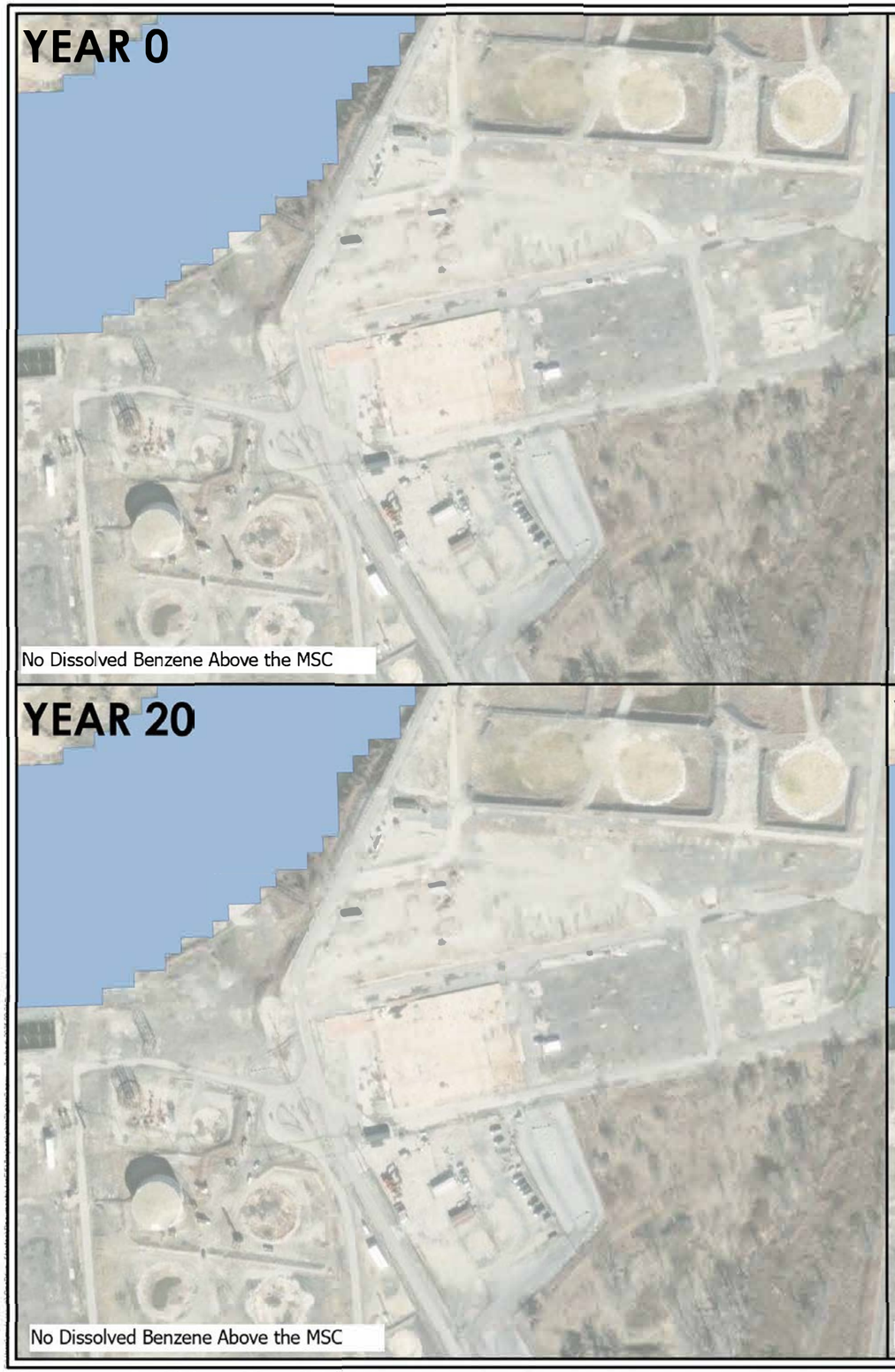




Figure No.
9-9

Title
SIMULATED BENZENE DISTRIBUTION OVER 30 YEARS-LOWER AQUIFER LOWER SAND

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213403039
Prepared by MCW on 9/26/2025
Technical Review by JT on 9/26/2025
Independent Review by AK on 9/26/2025

0 250 500 Feet
1:4000 (At Original document size of 11x17)

N

Benzene Dissolved Phase Concentration (ug/L)
- 0-5 (no color)
- 5 - 100
- 100 - 1,000
- 1,000 - 10,000
- 10,000 - 100,000
- >100,000
- River Boundary



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: USA Topo Maps: Copyright:© 2013 National Geographic Society, i-cubed
World Imagery: Maxar, Microsoft
4. ug/L = micrograms per liter

Stantec

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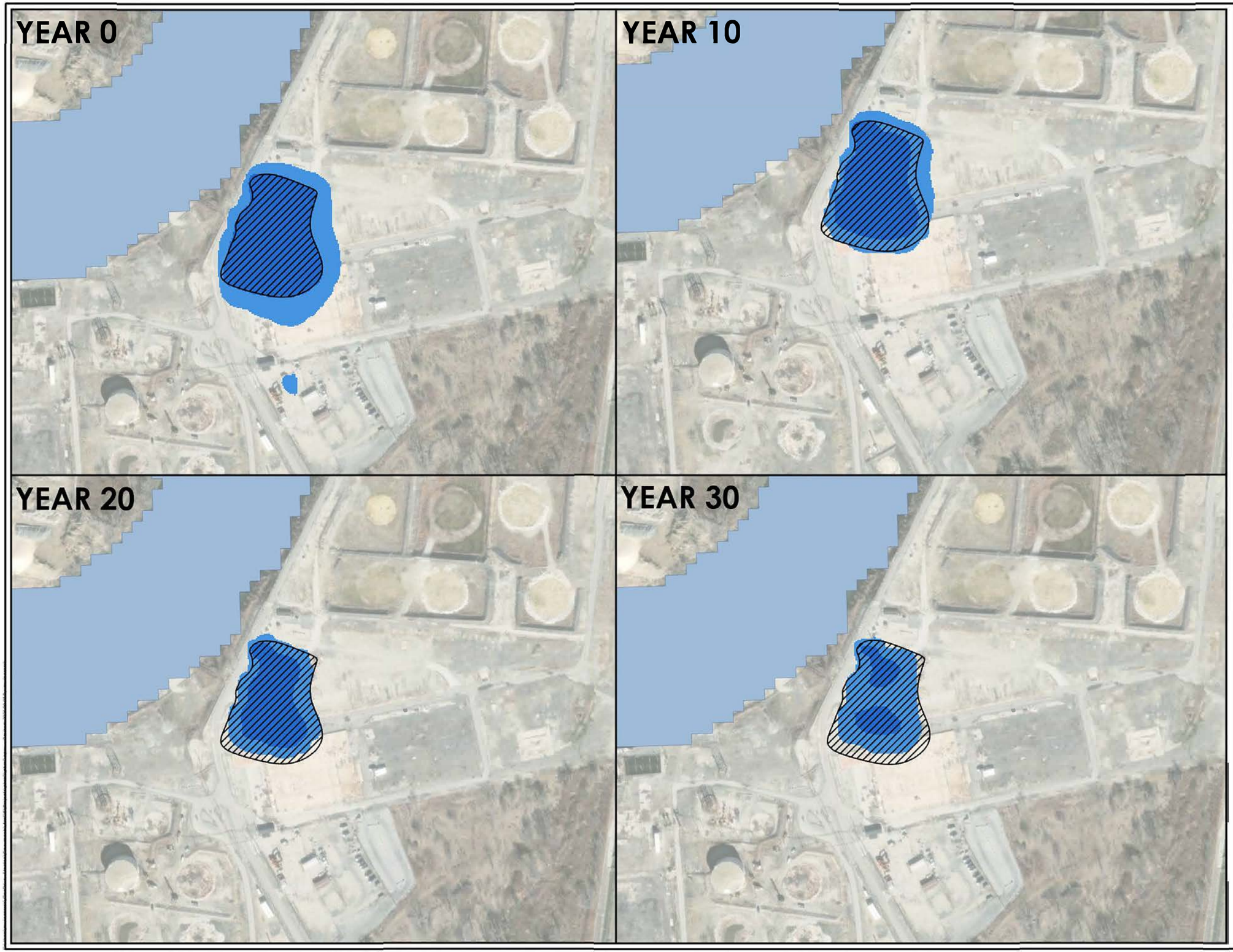


Figure No.
9-10

Title
SIMULATED TOLUENE DISTRIBUTION OVER 30 YEARS-WATER TABLE

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213403039
Prepared by MCW on 9/25/2025
Technical Review by JT on 9/25/2025
Independent Review by AK on 9/25/2025

0 265 530 Feet
1:4000 (At Original document size of 11x17)

N

Source Area (ug/L)

Toluene Dissolved Phase Distribution (ug/L)

- 0 - 1,000 (no color)
- 1,000 - 10,000
- 10,000- 100,000
- >100,000
- River Boundary



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: USA Topo Maps: Copyright© 2013 National Geographic Society, i-cubed
World Imagery: Maxar, Microsoft
World Imagery: Maxar
4. ug/L = micrograms per liter

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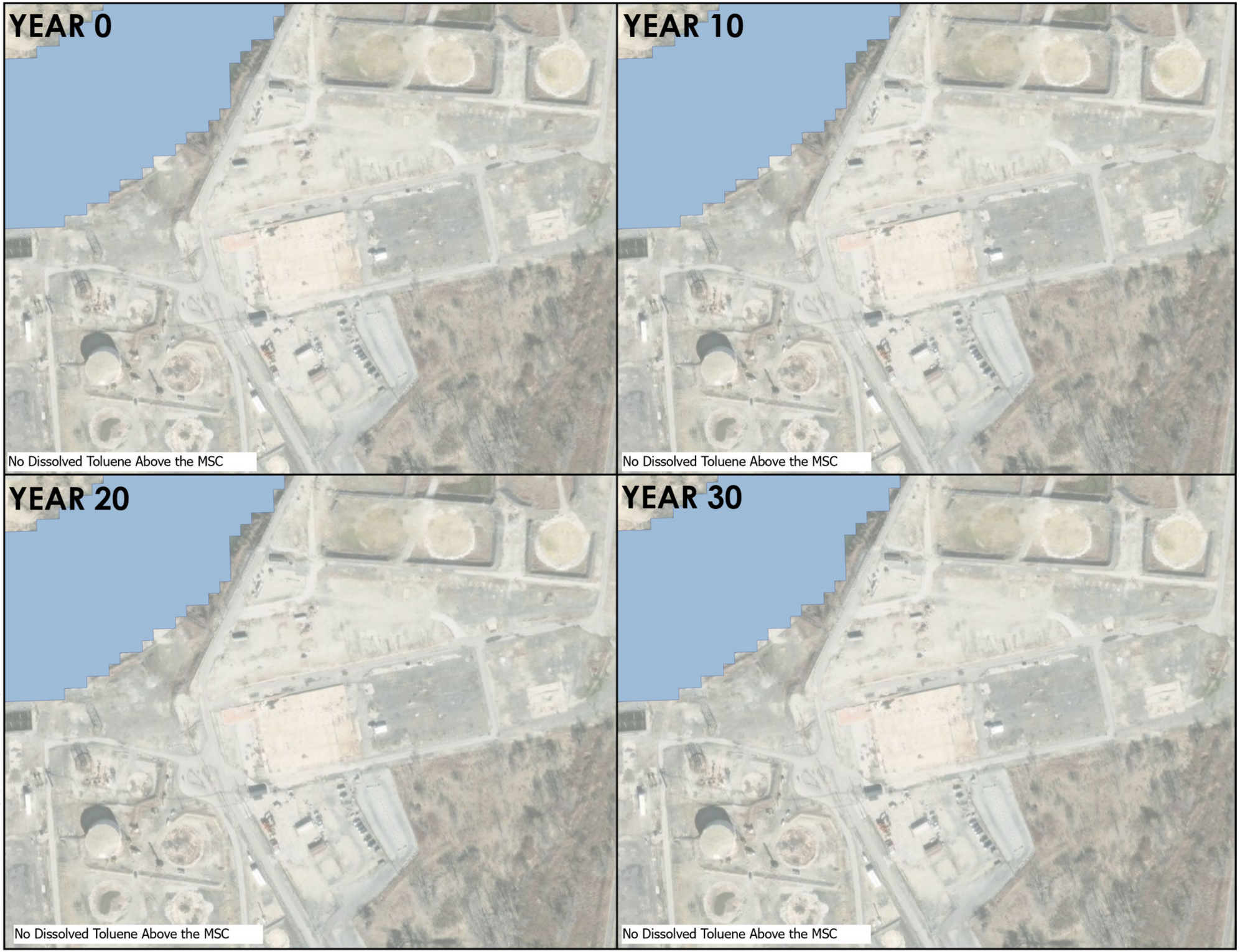


Figure No.
9-11

Title
SIMULATED TOLUENE DISTRIBUTION OVER 30 YEARS-UPPER SAND

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

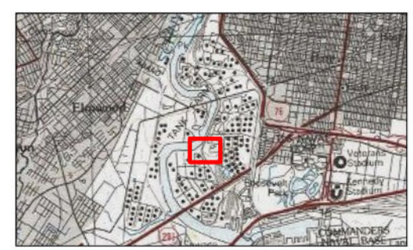
Project Location:
City of Philadelphia, Pennsylvania

213403039
Prepared by MCW on 9/26/2025
Technical Review by JT on 9/26/2025
Independent Review by AK on 9/26/2025

0 250 500 Feet
1:4000 (At Original document size of 11x17)

N

River Boundary



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: USA Topo Maps: Copyright© 2013 National Geographic Society, i-cubed
World Imagery: Maxar, Microsoft
4. ug/L = micrograms per liter

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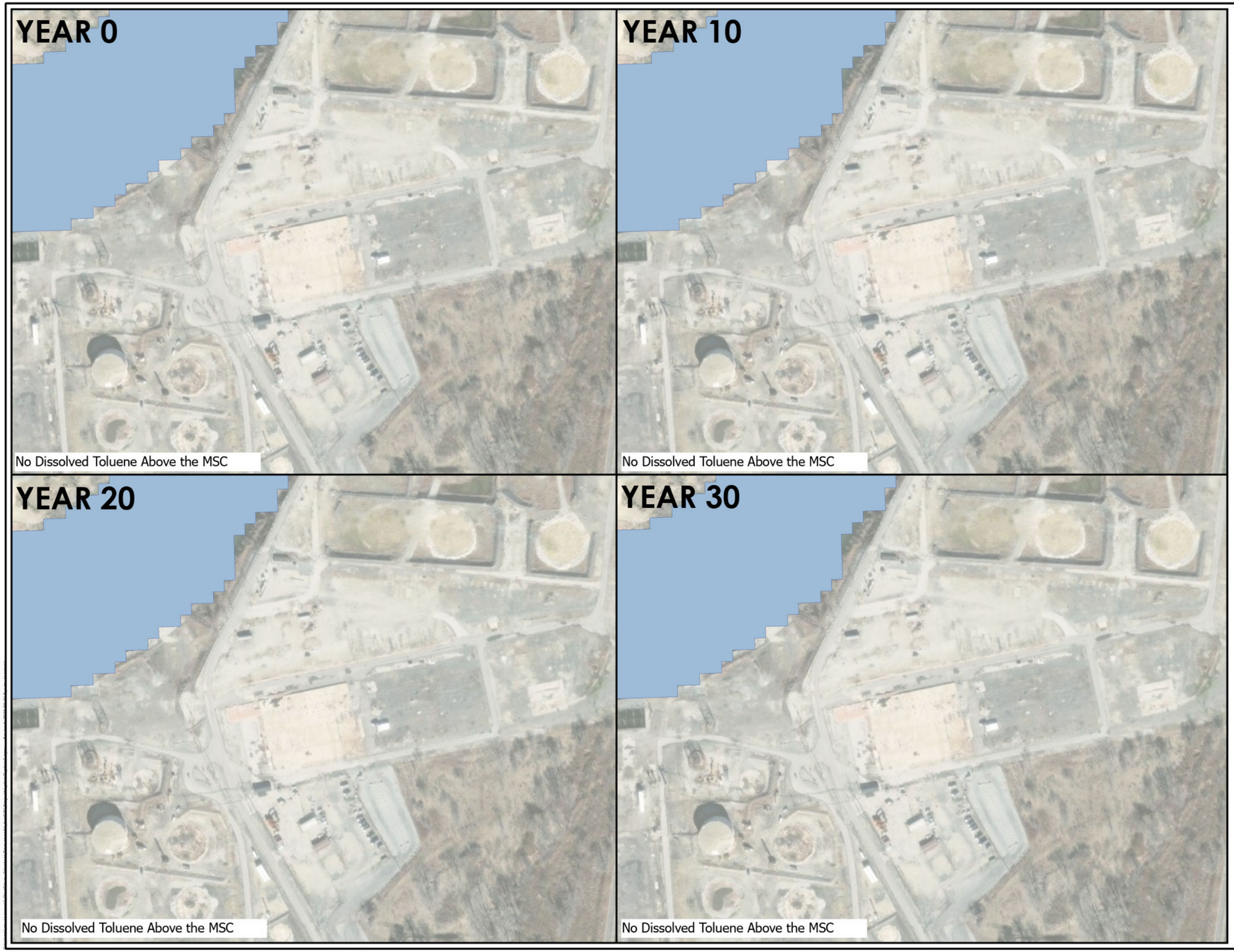


Figure No.
9-12

Title
SIMULATED TOLUENE DISTRIBUTION OVER 30 YEARS-LOWER AQUIFER MIDDLE SAND

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213403039
Prepared by MCW on 9/26/2025
Technical Review by JT on 9/26/2025
Independent Review by AK on 9/26/2025

0 250 500 Feet
1:4000 (At Original document size of 11x17)

N

River Boundary



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: USA Topo Maps: Copyright:© 2013 National Geographic Society, i-cubed
World Imagery: Maxar, Microsoft
World Imagery: Maxar.
4. ug/L = micrograms per liter

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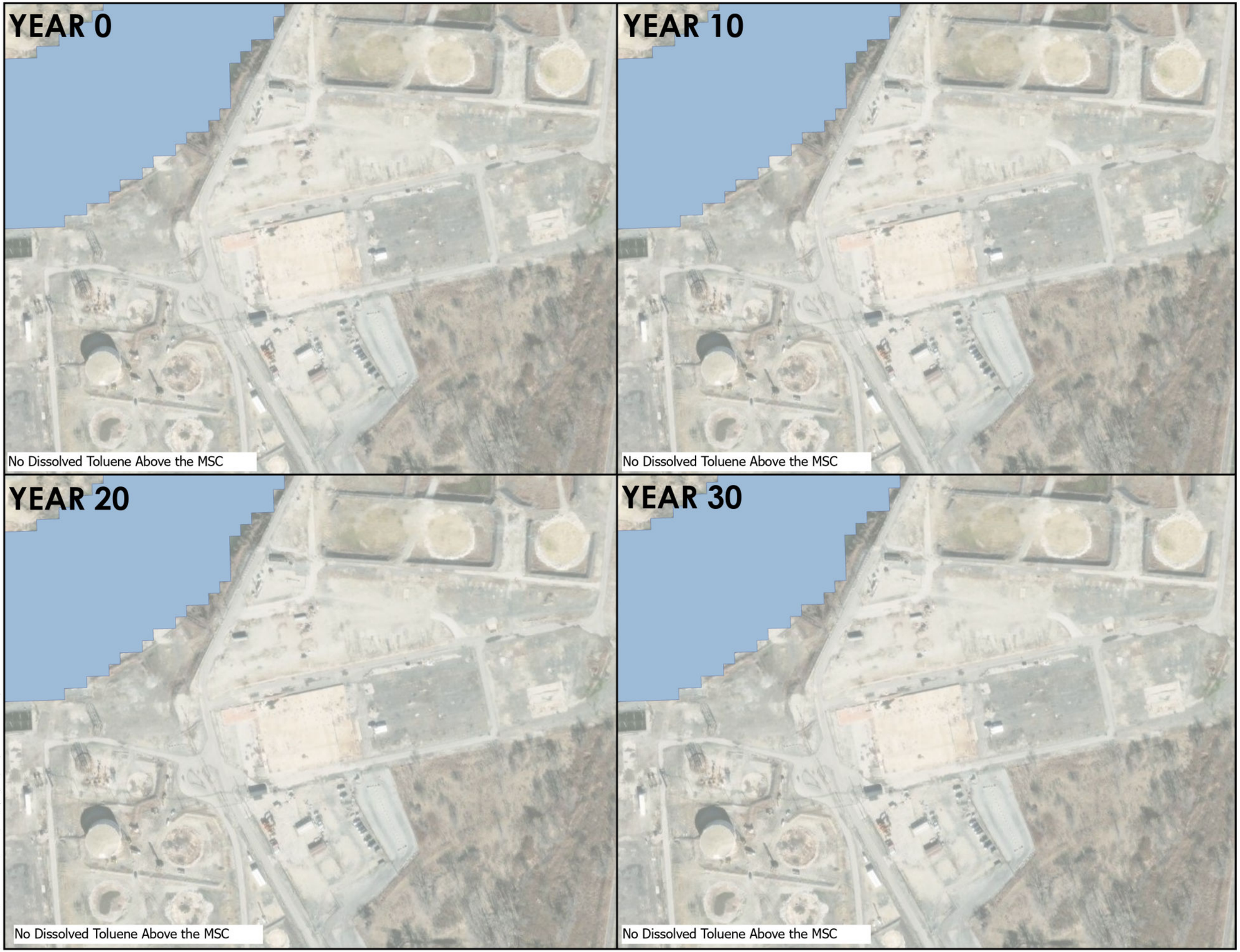


Figure No.
9-13

Title
SIMULATED TOLUENE DISTRIBUTION OVER 30 YEARS-LOWER AQUIFER LOWER SAND

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

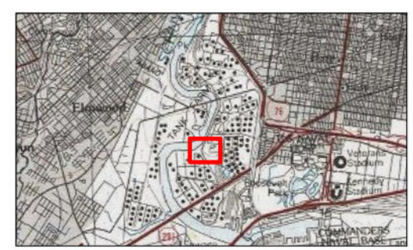
Project Location:
City of Philadelphia, Pennsylvania

213403039
Prepared by MCW on 9/26/2025
Technical Review by JT on 9/26/2025
Independent Review by AK on 9/26/2025

0 250 500 Feet
1:4000 (At Original document size of 11x17)

N

River Boundary



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: USA Topo Maps: Copyright© 2013 National Geographic Society, i-cubed
World Imagery: Maxar, Microsoft
4. ug/L = micrograms per liter

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Tables

Table 2-1
Generalized Stratigraphic Section and Interpreted Hydrostratigraphic Units
Former PES Refinery
Bellwether District Holdings, LLC

<table>
<tr><th>System</th><th>Series</th><th colspan="2">Hydrogeologic Unit</th><th>Hydrostratigraphic Unit</th><th>GWF Model Layer</th></tr>
<tr><td rowspan="2">Quaternary</td><td>Holocene</td><td colspan="2">alluvium</td><td rowspan="8">Water-Table aquifer
(unconfined)

Aquitard

Lower aquifer
(semi-confined)</td><td>1</td></tr>
<tr><td>Pleistocene</td><td colspan="2">Pleistocene alluvium</td><td>1</td></tr>
<tr><td rowspan="6">Cretaceous</td><td rowspan="5">Upper Cretaceous</td><td rowspan="6">Potomac-Raritan-Magothy aquifer system</td><td>Upper clay unit</td><td>2</td></tr>
<tr><td>Upper sand unit</td><td>3</td></tr>
<tr><td>Middle clay unit</td><td>4</td></tr>
<tr><td>Middle sand unit</td><td>5</td></tr>
<tr><td>Lower clay unit</td><td>6</td></tr>
<tr><td>Lower sand unit</td><td>7</td></tr>
<tr><td>Lower Cretaceous</td><td></td></tr>
<tr><td>Pre-Cretaceous</td><td></td><td colspan="2">Wissahickon Formation</td><td></td><td></td></tr>
</table>

Notes:

1. Adopted from Figure 2 of Schreffler, 2001.
2. Hydrostratigraphic units interpreted by Stantec based on observed subsurface conditions at the former PES Refinery.
3. GWF = groundwater flow
4. GWF Model layers depict the parameterized numerical model layers of Evergreen's model adopted from Stantec (2025) for this report

Table 3-1a
Well Construction Details
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC, Philadelphia, PA

Well_ID	Former Well ID or Boring ID	Well Type	Status	Easting	Northing	Hydrostratigraphic Unit	Soil Boring Log Available (Y/N)	Construction Detail Available (Y/N)	Date of Well Completion	Well Completion Depth	Well Diameter	Top of Inner Casing Elevation	Ground Surface Elevation	Top of Screen Elevation	Bottom of Screen Elevation	Depth to Screen	Screen Length
BF-103R		MW		2682490.9	219959.25	unconfined	Y	Y	10/8/1986	14	4	14.57	12.43	8.43	-1.57	4	10
S-283		MW		2682503.33	220303.4999	unconfined	Y	Y	5/14/2010	24	4	11.14	11.48	2.48	-12.52	9	15
S-382		MW		2682249.73	220407.5601	unconfined	Y	Y	8/1/2013	28	4	20.32	- -	7.32	-7.68	13	15
S-414		MW		2682403.3	220563.7999	unconfined	Y	Y	10/16/2015	30	4	22.53	20.01	10.01	-9.99	10	20
S-428		MW		2682724.29	220249.9899	unconfined	Y	Y	9/18/2018	22.7	4	10.84	11.30	3.60	-11.40	7.7	15
S-429		MW		2682257.5	220522.4601	unconfined	Y	Y	9/18/2018	27	4	21.21	19.40	2.40	-7.60	17	10
S-430	MIHPT-10	MW		2682288.19	220761.2598	unconfined	N	Y	9/27/2018	17	2	13.09	9.90	2.90	-7.10	7	10
S-431	MIHPT-11	MW		2682232.3	220624.4799	unconfined	N	Y	9/27/2018	18	2	17.52	14.00	6.00	-4.00	8	10
S-432	MIHPT-08	MW		2682255.97	220519.32	unconfined	N	Y	8/23/2018	24.5	1.5	22.02	19.20	4.70	-5.30	14.5	10
S-433		MW		2682191.6	220032.5001	unconfined	Y	Y	1/8/2020	23	4	11.68	12.20	-0.80	-10.80	13	10
S-434		MW	DESTROYED	2682610.4	219597.2999	unconfined	Y	Y	1/7/2020	20	4	13.10	10.90	0.90	-9.10	10	10
S-435		MW	ABANDONED	2682591.3	219886.1999	unconfined	Y	Y	1/8/2020	23	4	15.15	13.20	3.20	-9.80	10	13
S-436		MW	ABANDONED	2682814.2	219690.9998	unconfined	Y	Y	1/7/2020	20	4	13.90	11.70	1.70	-8.30	10	10
S-437		MW		2682424.9	220471.3001	unconfined	N	Y	1/9/2020	27	4	20.85	18.50	5.50	-8.50	13	14
S-438	UVHP-06	MW		2682239.7	220484.2	unconfined	N	Y	1/10/2020	24.5	4	21.26	18.70	4.20	-5.80	14.5	10
S-439	UVHP-15	MW		2682531.3	220606.8999	unconfined	Y	Y	1/14/2020	30	4	22.55	20.00	5.00	-10.00	15	15
S-479	CD-01	MW		2682150.12	220478.56	unconfined	Y	Y	12/21/2021	22	1.5	15.51	15.80	3.80	-6.20	12	10
S-480	CD-03	MW	DESTROYED	2682726.49	220561.2901	unconfined	Y	Y	12/16/2021	26	1.5	18.71	18.90	2.90	-7.10	16	10
S-481	CD-08D	MW		2682196.48	220288.23	unconfined	Y	Y	12/20/2021	23	1.5	16.52	16.80	3.80	-6.20	13	10
S-482	OIHPT-01	MW		2682301.59	220639.7699	unconfined	Y	Y	12/17/2021	38	1.5	19.53	19.80	3.80	-6.20	16	10
S-483	OIHPT-02	MW	DESTROYED	2682454.88	219858.6101	unconfined	Y	Y	12/20/2021	35	1.5	12.44	12.80	2.80	-7.20	10	10
S-484	CD-02A	MW		2682317.254	220459.3064	unconfined	N	Y	2/11/2022	25	4	17.67	18.00	3.00	-7.00	15	10
S-485	CD-12B	MW	ABANDONED	2682447.5	220159.9	unconfined	Y	Y	2/14/2022	24	4	15.44	15.80	1.80	-8.20	14	10
S-507	CD-06	MW	DESTROYED	2682402.689	219984.476	lower aquifer	Y	Y	6/28/2023	68	2	11.30	11.69	-41.31	-56.31	53	15
S-508	CD-02A	MW		2682317.723	220466.022	lower aquifer	Y	Y	6/29/2023	88	2	17.85	18.17	-54.83	-69.83	73	15
S-509	CD-12D	MW	ABANDONED	2682556.216	220181.797	lower aquifer	Y	Y	6/30/2023	86.5	2	15.31	15.74	-55.76	-70.76	71.5	15
UDEX-AS-1		AS		2682402.881	220573.5962	unconfined	N	Y	5/20/2024	24	1.5	- -	- -	- -	- -	22	2
UDEX-AS-2		AS		2682379.534	220582.2841	unconfined	N	Y	5/21/2024	24	1.5	- -	- -	- -	- -	22	2
UDEX-AS-3		AS		2682391.479	220555.1345	unconfined	N	Y	5/21/2024	25	1.5	- -	- -	- -	- -	23	2
UDEX-AS-4		AS		2682418.355	220543.4602	unconfined	N	Y	5/22/2024	24	1.5	- -	- -	- -	- -	22	2
UDEX-AS-5		AS		2682423.233	220565.5538	unconfined	N	Y	5/22/2024	24	1.5	- -	- -	- -	- -	22	2
UDEX-AS-6		AS		2682317.36	220468.2517	unconfined	N	Y	5/23/2024	23	1.5	- -	- -	- -	- -	21	2
UDEX-AS-7		AS		2682292.384	220473.6816	unconfined	N	Y	5/23/2024	22	1.5	- -	- -	- -	- -	20	2
UDEX-AS-8		AS		2682335.821	220466.3512	unconfined	N	Y	5/28/2024	22	1.5	- -	- -	- -	- -	20	2
UDEX-AS-9		AS		2682333.377	220438.9302	unconfined	N	Y	5/29/2024	22	1.5	- -	- -	- -	- -	20	2
UDEX-AS-10		AS		2682305.958	220450.0615	unconfined	N	Y	5/29/2024	22	1.5	- -	- -	- -	- -	20	2
UDEX-AS-11		AS		2682447.561	220481.8595	unconfined	N	Y	1/21/2025	25	2	- -	- -	- -	- -	22.5	2.5
UDEX-AS-12		AS		2682434.899	220471.1856	unconfined	N	Y	1/22/2025	25	2	- -	- -	- -	- -	22.5	2.5
UDEX-AS-13		AS		2682415.413	220488.9067	unconfined	N	Y	1/28/2025	25	2	- -	- -	- -	- -	22.3	2.5
UDEX-AS-14		AS		2682423.372	220456.3782	unconfined	N	Y	1/28/2025	25	2	- -	- -	- -	- -	22.5	2.5
UDEX-AS-15		AS		2682395.518	220465.2414	unconfined	N	Y	1/28/2025	25	2	- -	- -	- -	- -	22.5	2.5
UDEX-AS-16		AS		2682308.375	220647.5338	unconfined	N	Y	1/29/2025	25	2	- -	- -	- -	- -	22.5	2.5
UDEX-AS-17		AS		2682300.875	220645.2499	unconfined	N	Y	1/29/2025	25	2	- -	- -	- -	- -	22.5	2.5
UDEX-AS-18		AS		2682306.493	220608.4653	unconfined	N	Y	1/30/2025	25	2	- -	- -	- -	- -	22.5	2.5
UDEX-AS-19		AS		2682288.067	220603.1647	unconfined	N	Y	1/30/2025	25	2	- -	- -	- -	- -	22.5	2.5

Table 3-1a
Well Construction Details
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC, Philadelphia, PA

Well_ID	Former Well ID or Boring ID	Well Type	Status	Easting	Northing	Hydrostratigraphic Unit	Soil Boring Log Available (Y/N)	Construction Detail Available (Y/N)	Date of Well Completion	Well Completion Depth	Well Diameter	Top of Inner Casing Elevation	Ground Surface Elevation	Top of Screen Elevation	Bottom of Screen Elevation	Depth to Screen	Screen Length
UDEX-AS-20		AS		2682293.821	220619.3999	unconfined	N	Y	1/31/2025	25	2	--	--	--	--	22.5	2.5
UDEX-EW-1		SVE		2682523.307	220608.337	unconfined	Y	Y	2/17/2021	19	6	--	--	--	--	14	5
UDEX-EW-2		SVE	DESTROYED	2682214.135	220291.5446	unconfined	Y	Y	2/25/2021	13	6	--	--	--	--	8	5
UDEX-EW-3		SVE		2682302.404	220632.5214	unconfined	Y	Y	2/24/2021	17	6	--	--	--	--	12	5
UDEX-EW-4		SVE		2682279.007	220573.9738	unconfined	N	Y	2/2/2022	18	6	--	--	--	--	13	5
UDEX-EW-5		SVE		2682242.06	220508.5379	unconfined	N	Y	2/1/2022	16	6	--	--	--	--	11	5
UDEX-EW-6		SVE		2682217.64	220438.5907	unconfined	N	Y	2/2/2022	15	6	--	--	--	--	10	5
UDEX-EW-7		SVE		2682187.89	220371.35	unconfined	N	Y	2/4/2022	15	6	--	--	--	--	10	5
UDEX-EW-8		SVE	DESTROYED	2682308.41	220282.6067	unconfined	N	Y	2/9/2022	10	6	--	--	--	--	5	5
UDEX-EW-9		SVE	DESTROYED	2682409.212	220299.5923	unconfined	N	Y	2/9/2022	9.5	6	--	--	--	--	4.5	5
UDEX-EW-10		SVE	DESTROYED	2682511.112	220305.8453	unconfined	N	Y	2/9/2022	9.5	6	--	--	--	--	4.5	5
UDEX-EW-11		SVE	DESTROYED	2682437.13	220391.02	unconfined	N	Y	1/27/2022	15	6	--	--	--	--	10	5
UDEX-EW-12		SVE	DESTROYED	2682510.636	220431.8221	unconfined	N	Y	2/1/2022	15	6	--	--	--	--	10	5
UDEX-EW-13		SVE		2682524.39	220517.98	unconfined	N	Y	2/7/2022	16	6	--	--	--	--	11	5
UDEX-EW-14		SVE		2682443.62	220562.19	unconfined	N	Y	2/4/2022	17	6	--	--	--	--	12	5
UDEX-EW-15		SVE		2682227.382	220197.949	unconfined	N	Y	2/3/2022	13	6	--	--	--	--	8	5
UDEX-EW-16		SVE		2682319.503	220167.0342	unconfined	N	Y	2/10/2022	11	6	--	--	--	--	6	5
UDEX-EW-17		SVE		2682253.273	220125.2161	unconfined	N	Y	2/3/2022	13	6	--	--	--	--	8	5
UDEX-EW-18		SVE		2682335.477	220086.1191	unconfined	N	Y	2/10/2022	10	6	--	--	--	--	5	5
UDEX-EW-19		SVE		2682265.301	220045.5134	unconfined	N	Y	2/4/2022	11	6	--	--	--	--	6	5
UDEX-EW-20		SVE		2682318.644	219995.4362	unconfined	N	Y	2/10/2022	10	6	--	--	--	--	5	5
UDEX-EW-21		SVE		2682382.668	219930.1248	unconfined	N	Y	2/9/2022	10	6	--	--	--	--	5	5
UDEX-EW-22		SVE		2682451.457	219858.2684	unconfined	N	Y	2/8/2022	11	6	--	--	--	--	6	5
UDEX-EW-23		SVE		2682487.382	219943.1818	unconfined	N	Y	2/8/2022	11	6	--	--	--	--	6	5
UDEX-EW-24		SVE		2682432.365	220420.6592	unconfined	Y	Y	1/29/2025	15	6	--	--	--	--	10	5

Notes:
Coordinate pairs are projected in the Pennsylvania State Plane Coordinate System (feet), referenced to the North American Vertical Datum of 1988 (NAVD88).
The hydrostratigraphic unit denotes the aquifer and/or mappable water-bearing stratum in which the well is interpreted to be screened by Stantec.
-- = parameter not available
MW = monitoring well
AS = air sparge
SVE = soil vapor extraction
ft bgs = feet below ground surface
in = inches
ft = feet
Y = Yes; N = No

Table 3-1b
Soil Boring Details
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC, Philadelphia, PA

Boring ID	Easting	Northing	Boring Type	Technologies Used	Soil Boring Log Available (Y/N)	Date of Boring Completion	Boring Completion Depth (ft bgs)	Comment
UDEX-BH-21-01	2682448.7	219975.1	direct push	- -	Y	2/25/2021	20.0	
UDEX-VP-01A	2682521.601	220620.2609	direct push	- -	Y	2/23/2021	25.0	
UDEX-VP-01B	2682501.809	220601.5109	direct push	- -	Y	2/22/2021	19.0	
UDEX-VP-01C	2682529.674	220571.563	direct push	- -	Y	2/24/2021	19.0	
UDEX-VP-02A	2682204.526	220294.1584	direct push	- -	Y	2/26/2021	20.0	
UDEX-VP-02B	2682240.551	220275.2782	direct push	- -	Y	2/26/2021	15.0	
UDEX-VP-02C	2682196.497	220242.7262	direct push	- -	Y	2/26/2021	17.0	
UDEX-VP-03A	2682305.814	220643.1905	direct push	- -	Y	2/24/2021	25.0	
UDEX-VP-03B	2682288.425	220602.2977	direct push	- -	Y	2/25/2021	20.0	
UDEX-VP-03C	2682329.659	220592.2969	direct push	- -	Y	2/25/2021	25.0	
MiHpt-01	2682571.214	220035.422	direct push	MIP, HPT, EC	N	8/21/2018	37.3	
MiHpt-02	2682727.638	220247.3144	direct push	MIP, HPT, EC	N	8/21/2018	38.8	
MiHpt-03	2682755.242	220562.0713	direct push	MIP, HPT, EC	N	8/21/2018	39.0	
MiHpt-04	2683145.73	220106.4272	direct push	MIP, HPT, EC	N	8/22/2018	34.1	
MiHpt-05	2682241.729	220162.8552	direct push	MIP, HPT, EC	N	8/22/2018	39.4	
MiHpt-06	2682488.297	220650.7287	direct push	MIP, HPT, EC	N	8/23/2018	38.9	
MiHpt-07	2682391.509	220831.7183	direct push	MIP, HPT, EC	N	8/23/2018	37.1	
MiHpt-08	2682265.424	220537.4475	direct push	MIP, HPT, EC	N	8/23/2018	39.0	
MiHpt-09	2682144.629	220170.6605	direct push	MIP, HPT, EC	N	8/23/2018	21.0	
MiHpt-10	2682290.94	220779.6883	direct push	MIP, HPT, EC	N	9/27/2018	28.4	
MiHpt-11	2682227.398	220626.1293	direct push	MIP, HPT, EC	N	9/27/2018	33.0	
MiHpt-12	2682105.354	220488.5326	direct push	MIP, HPT, EC	N	9/27/2018	56.2	
UVHP-01	2682237.573	220399.3923	direct push	UVOST, HPT	Y	5/14/2019	29.7	reimaged on 7/12/2022
UVHP-02	2682195.746	220353.4613	direct push	UVOST, HPT	N	5/14/2019	33.7	reimaged on 7/12/2022
UVHP-03	2682217.782	220434.6001	direct push	UVOST, HPT	N	5/14/2019	30.1	reimaged on 7/12/2022
UVHP-04	2682293.767	220446.9177	direct push	UVOST, HPT	N	5/14/2019	29.9	reimaged on 7/14/2022
UVHP-05	2682216.692	220293.3304	direct push	UVOST, HPT	N	5/14/2019	30.2	reimaged on 7/12/2022
UVHP-06	2682249.513	220506.4668	direct push	UVOST, HPT	N	5/15/2019	29.8	reimaged on 7/12/2022
UVHP-07	2682309.081	220646.8473	direct push	UVOST, HPT	Y	5/15/2019	34.0	reimaged on 7/14/2022
UVHP-08	2682403.424	220567.746	direct push	UVOST, HPT	Y	5/15/2019	33.6	reimaged on 7/14/2022
UVHP-09	2682430.698	220471.9049	direct push	UVOST, HPT	N	5/15/2019	32.5	reimaged on 7/13/2022
UVHP-10	2682406.153	220394.2651	direct push	UVOST, HPT	N	5/15/2019	33.7	reimaged on 7/13/2022
UVHP-11	2682307.402	220376.2478	direct push	UVOST, HPT	N	5/15/2019	33.9	reimaged on 7/13/2022
UVHP-12	2682308.379	220282.0043	direct push	UVOST, HPT	N	5/16/2019	33.5	reimaged on 7/13/2022
UVHP-13	2682502.219	220308.4786	direct push	UVOST, HPT	N	5/16/2019	15.0	reimaged on 7/13/2022
UVHP-14	2682247.606	220162.1924	direct push	UVOST, HPT	N	5/16/2019	41.9	reimaged on 7/13/2022
UVHP-15	2682530.687	220607.2172	direct push	UVOST, HPT	N	5/16/2019	34.1	reimaged on 7/14/2022
UVHP-16	2682502.607	220681.7357	direct push	UVOST, HPT	N	7/14/2022	25.1	
UVHP-17	2682398.44	220680.3469	direct push	UVOST, HPT	N	7/14/2022	25.0	
UVHP-18	2682445.662	220656.0413	direct push	UVOST, HPT	N	7/14/2022	25.1	
UVHP-19	2682375.524	220644.2357	direct push	UVOST, HPT	N	7/14/2022	25.1	
UVHP-20	2682534.857	220518.2732	direct push	UVOST, HPT	N	7/14/2022	25.0	
UVHP-21	2682514.514	220422.9176	direct push	UVOST, HPT	N	7/14/2022	25.0	
UVHP-22	2682275.489	220045.9453	direct push	UVOST, HPT	N	7/13/2022	21.9	

Table 3-1b
Soil Boring Details
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC, Philadelphia, PA

Boring ID	Easting	Northing	Boring Type	Technologies Used	Soil Boring Log Available (Y/N)	Date of Boring Completion	Boring Completion Depth (ft bgs)	Comment
UVHP-23	2682474.465	219941.6899	direct push	UVOST, HPT	N	7/13/2022	21.7	
UVHP-24	2682445.858	219866.6768	direct push	UVOST, HPT	N	7/14/2022	17.9	
CD-01	2682147.563	220474.0544	direct push	OIP, HPT, EC	N	12/16/2021	38.5	
CD-02A	2682317.254	220459.3064	direct push	OIP, HPT, EC	N	12/8/2021	53.5	
CD-02B	2682600.948	220524.1028	direct push	OIP, HPT, EC	N	12/7/2021	41.5	
CD-03	2682728.373	220553.153	direct push	OIP, HPT, EC	N	12/8/2021	41.5	
CD-05A	2682581.985	220356.7075	direct push	OIP, HPT, EC	N	12/10/2021	36.5	
CD-05B	2682645.568	220370.2071	direct push	OIP, HPT, EC	N	12/10/2021	36.5	
CD-06	2682407.508	219976.9343	direct push	OIP, HPT, EC	N	12/14/2021	54.0	
CD-07A	2682389.307	219910.9299	direct push	OIP, HPT, EC	N	12/14/2021	36.5	
CD-07B*	2682453.07	219923.5493	direct push	OIP, HPT, EC	N	12/13/2021	17.5	*refusal encountered at 17.5 ft bgs
CD-08A	2682181.222	220366.4303	direct push	OIP, HPT, EC	N	12/9/2021	41.8	
CD-08B	2682223.539	220171.9818	direct push	OIP, HPT, EC	N	12/9/2021	16.5	
CD-08C	2682248.42	220057.6582	direct push	OIP, HPT, EC	N	12/9/2021	36.0	
CD-08D	2682197.915	220289.7264	direct push	OIP, HPT, EC	N	12/9/2021	41.8	
CD-09A	2682461.2	220477.4795	direct push	OIP, HPT, EC	N	12/8/2021	41.8	
CD-09B*	2682499.782	220268.8635	direct push	OIP, HPT, EC	N	12/15/2021	11.5	*multiple refusals encountered; offset and replaced by OIHPT-04
CD-11A	2682383.915	220593.9951	direct push	OIP, HPT, EC	N	12/6/2021	45.0	
CD-11B	2682581.239	220632.2624	direct push	OIP, HPT, EC	N	12/7/2021	45.5	
CD-11C	2682676.465	220650.7298	direct push	OIP, HPT, EC	N	12/7/2021	46.0	
CD-12A*	2682400.046	220155.8532	direct push	OIP, HPT, EC	N	12/15/2021	17.0	*refusal encountered at 17 bgs
CD-12B	2682447.986	220165.9868	direct push	OIP, HPT, EC	N	12/15/2021	39.0	
CD-12C	2682617.246	220201.7642	direct push	OIP, HPT, EC	N	12/15/2021	39.0	
OIHPT-01	2682302.883	220636.5844	direct push	OIP, HPT, EC	N	12/8/2021	37.5	
OIHPT-02	2682452.452	219856.7409	direct push	OIP, HPT, EC	N	12/10/2021	37.0	
OIHPT-03*	2682369.173	219773.462	direct push	OIP, HPT, EC	N	12/10/2021	- -	*multiple refusals encountered; boring not completed
OIHPT-04	2682493.894	220301.2772	direct push	OIP, HPT, EC	N	12/10/2021	36.5	replacement boring for CD-09B; offset from building slab

Notes
Coordinate pairs are projected in the Pennsylvania State Plane Coordinate System (feet), referenced to the North American Vertical Datum of 1988 (NAVD88).
MIP = membrane-interface probe
UVOST = ultraviolet optical screening tool
OIP = optical interface probe
HPT = hydraulic profiling tool
EC = electrical conductivity

Table 3-2
Well Gauging Summary, 2018 to Present
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC, Philadelphia, PA

Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
BF-103R	6/18/2018	--	13.63	--	0.94	unconfined		0.71
BF-103R	2/26/2019	--	14.21	--	0.36	unconfined		0.71
BF-103R	5/22/2019	13.31	13.92	0.61	1.08	unconfined		0.71
BF-103R	5/24/2019	13.36	13.81	0.45	1.08	unconfined		0.71
BF-103R	5/28/2019	13.45	13.85	0.40	1.00	unconfined		0.71
BF-103R	5/31/2019	13.47	13.88	0.41	0.98	unconfined		0.71
BF-103R	6/10/2019	13.54	14.34	0.80	0.80	unconfined		0.71
BF-103R	6/14/2019	13.36	14.48	1.12	0.88	unconfined		0.71
BF-103R	6/17/2019	13.49	14.48	0.99	0.79	unconfined		0.71
BF-103R	6/26/2019	12.92	13.66	0.74	1.43	unconfined		0.71
BF-103R	6/28/2019	13.10	13.66	0.56	1.31	unconfined		0.71
BF-103R	7/1/2019	13.21	13.63	0.42	1.24	unconfined		0.71
BF-103R	7/3/2019	13.31	13.65	0.34	1.16	unconfined		0.71
BF-103R	7/8/2019	13.13	13.49	0.36	1.33	unconfined		0.71
BF-103R	7/15/2019	13.07	13.45	0.38	1.39	unconfined		0.71
BF-103R	7/22/2019	13.30	13.61	0.31	1.18	unconfined		0.71
BF-103R	7/29/2019	13.41	13.55	0.14	1.12	unconfined		0.71
BF-103R	8/2/2019	13.49	13.79	0.30	0.99	unconfined		0.71
BF-103R	8/12/2019	13.47	13.89	0.42	0.98	unconfined		0.71
BF-103R	8/16/2019	13.57	13.77	0.20	0.94	unconfined		0.71
BF-103R	8/19/2019	13.54	14.01	0.47	0.89	unconfined		0.71
BF-103R	8/23/2019	13.54	14.35	0.81	0.79	unconfined		0.71
BF-103R	8/26/2019	13.44	14.55	1.11	0.81	unconfined		0.71
BF-103R	8/27/2019	13.40	14.44	1.04	0.87	unconfined		0.71
BF-103R	8/30/2019	13.47	14.64	1.17	0.76	unconfined		0.71
BF-103R	9/4/2019	13.49	14.76	1.27	0.71	unconfined		0.71
BF-103R	9/6/2019	13.62	14.86	1.24	0.59	unconfined		0.71
BF-103R	10/18/2019	14.27	15.67	1.40	-0.11	unconfined		0.71
BF-103R	11/14/2019	14.28	15.75	1.47	-0.14	unconfined		0.71
BF-103R	11/22/2019	14.28	15.82	1.54	-0.16	unconfined		0.71
BF-103R	12/16/2019	14.25	15.42	1.17	-0.02	unconfined		0.71
BF-103R	1/2/2020	14.00	15.03	1.03	0.27	unconfined		0.71
BF-103R	1/10/2020	14.22	15.45	1.23	-0.01	unconfined		0.71
BF-103R	1/13/2020	14.26	14.55	0.29	0.23	unconfined		0.71
BF-103R	1/21/2020	14.34	15.64	1.30	-0.15	unconfined		0.71
BF-103R	1/23/2020	14.29	15.60	1.31	-0.10	unconfined		0.71
BF-103R	1/28/2020	14.02	15.13	1.11	0.23	unconfined		0.71
BF-103R	1/31/2020	14.04	15.14	1.10	0.21	unconfined		0.71
BF-103R	2/4/2020	13.97	15.09	1.12	0.27	unconfined		0.71
BF-103R	2/13/2020	13.94	15.02	1.08	0.31	unconfined		0.71
BF-103R	2/21/2020	14.11	15.23	1.12	0.13	unconfined		0.71
BF-103R	2/25/2020	14.07	15.22	1.15	0.16	unconfined		0.71
BF-103R	2/27/2020	14.03	15.21	1.18	0.19	unconfined		0.71
BF-103R	4/16/2020	13.76	14.48	0.72	0.60	unconfined		0.71
BF-103R	4/17/2020	13.82	14.80	0.98	0.46	unconfined		0.71
BF-103R	4/23/2020	13.97	14.97	1.00	0.31	unconfined		0.71
BF-103R	4/27/2020	13.83	14.94	1.11	0.42	unconfined		0.71
BF-103R	4/30/2020	13.78	14.81	1.03	0.49	unconfined		0.71
BF-103R	5/12/2020	14.03	15.12	1.09	0.22	unconfined		0.71
BF-103R	5/14/2020	14.05	15.19	1.14	0.19	unconfined		0.71
BF-103R	5/19/2020	14.11	15.29	1.18	0.11	unconfined		0.71
BF-103R	5/21/2020	14.11	15.29	1.18	0.11	unconfined		0.71
BF-103R	5/26/2020	14.03	15.19	1.16	0.20	unconfined		0.71
BF-103R	5/28/2020	14.02	15.20	1.18	0.20	unconfined		0.71
BF-103R	6/1/2020	14.10	15.35	1.25	0.10	unconfined		0.71
BF-103R	6/5/2020	13.99	15.20	1.21	0.23	unconfined		0.71
BF-103R	6/8/2020	13.99	15.18	1.19	0.23	unconfined		0.71
BF-103R	6/11/2020	13.92	15.06	1.14	0.32	unconfined		0.71
BF-103R	6/16/2020	14.04	15.24	1.20	0.18	unconfined		0.71
BF-103R	6/19/2020	14.02	15.25	1.23	0.19	unconfined		0.71
BF-103R	6/26/2020	14.09	15.35	1.26	0.11	unconfined		0.71
BF-103R	7/1/2020	14.09	15.34	1.25	0.11	unconfined		0.71
BF-103R	7/7/2020	14.14	15.49	1.35	0.04	unconfined		0.71
BF-103R	7/9/2020	14.16	15.51	1.35	0.02	unconfined		0.71
BF-103R	7/14/2020	13.87	14.91	1.04	0.40	unconfined		0.71
BF-103R	7/17/2020	13.91	14.97	1.06	0.35	unconfined		0.71
BF-103R	7/22/2020	13.98	15.14	1.16	0.25	unconfined		0.71

Table 3-2
Well Gauging Summary, 2018 to Present
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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
BF-103R	7/24/2020	13.96	15.09	1.13	0.28	unconfined		0.71
BF-103R	7/28/2020	14.01	15.20	1.19	0.21	unconfined		0.71
BF-103R	7/30/2020	14.11	15.29	1.18	0.11	unconfined		0.71
BF-103R	8/4/2020	14.10	15.29	1.19	0.12	unconfined		0.71
BF-103R	8/6/2020	13.81	14.97	1.16	0.42	unconfined		0.71
BF-103R	8/13/2020	13.61	14.51	0.90	0.70	unconfined		0.71
BF-103R	8/17/2020	13.58	14.60	1.02	0.69	unconfined		0.71
BF-103R	8/18/2020	13.58	14.60	1.02	0.69	unconfined		0.71
BF-103R	8/20/2020	13.65	14.64	0.99	0.63	unconfined		0.71
BF-103R	8/25/2020	13.71	14.79	1.08	0.54	unconfined		0.71
BF-103R	8/27/2020	13.75	14.75	1.00	0.53	unconfined		0.71
BF-103R	9/1/2020	13.82	14.95	1.13	0.42	unconfined		0.71
BF-103R	9/3/2020	13.79	14.94	1.15	0.44	unconfined		0.71
BF-103R	9/11/2020	13.92	15.19	1.27	0.28	unconfined		0.71
BF-103R	9/16/2020	13.95	15.20	1.25	0.25	unconfined		0.71
BF-103R	9/18/2020	13.91	15.19	1.28	0.29	unconfined		0.71
BF-103R	9/22/2020	14.01	15.31	1.30	0.18	unconfined		0.71
BF-103R	9/24/2020	13.99	15.25	1.26	0.21	unconfined		0.71
BF-103R	9/28/2020	14.18	15.43	1.25	0.02	unconfined		0.71
BF-103R	10/1/2020	13.95	14.82	0.87	0.37	unconfined		0.71
BF-103R	10/8/2020	13.96	15.23	1.27	0.24	unconfined		0.71
BF-103R	10/9/2020	14.11	15.46	1.35	0.07	unconfined		0.71
BF-103R	10/12/2020	14.11	15.53	1.42	0.04	unconfined		0.71
BF-103R	10/19/2020	14.02	15.27	1.25	0.18	unconfined		0.71
BF-103R	10/23/2020	14.09	15.37	1.28	0.11	unconfined		0.71
BF-103R	10/27/2020	14.33	15.44	1.11	-0.08	unconfined		0.71
BF-103R	10/30/2020	14.04	15.39	1.35	0.14	unconfined		0.71
BF-103R	11/2/2020	13.87	15.01	1.14	0.37	unconfined		0.71
BF-103R	11/9/2020	14.05	15.25	1.20	0.17	unconfined		0.71
BF-103R	11/10/2020	13.96	15.19	1.23	0.25	unconfined		0.71
BF-103R	11/16/2020	13.78	14.84	1.06	0.48	unconfined		0.71
BF-103R	11/19/2020	13.87	14.91	1.04	0.40	unconfined		0.71
BF-103R	11/23/2020	13.78	14.88	1.10	0.47	unconfined		0.71
BF-103R	11/25/2020	13.82	14.69	0.87	0.50	unconfined		0.71
BF-103R	11/30/2020	13.92	14.84	0.92	0.38	unconfined		0.71
BF-103R	12/4/2020	13.74	14.76	1.02	0.53	unconfined		0.71
BF-103R	12/8/2020	13.68	14.71	1.03	0.59	unconfined		0.71
BF-103R	12/11/2020	13.74	14.41	0.67	0.63	unconfined		0.71
BF-103R	12/14/2020	13.71	14.71	1.00	0.57	unconfined		0.71
BF-103R	12/18/2020	13.71	14.73	1.02	0.56	unconfined		0.71
BF-103R	12/21/2020	13.69	14.56	0.87	0.63	unconfined		0.71
BF-103R	12/28/2020	13.16	13.92	0.76	1.19	unconfined		0.71
BF-103R	1/4/2021	13.28	13.80	0.52	1.14	unconfined		0.71
BF-103R	1/15/2021	13.33	14.15	0.82	1.00	unconfined		0.71
BF-103R	3/15/2021	13.46	14.56	1.10	0.79	unconfined		0.71
BF-103R	5/3/2021	13.45	14.35	0.90	0.86	unconfined		0.71
BF-103R	5/4/2021	13.61	14.56	0.95	0.68	unconfined		0.71
BF-103R	5/6/2021	13.61	14.56	0.95	0.68	unconfined		0.71
BF-103R	5/11/2021	13.63	14.61	0.98	0.65	unconfined		0.71
BF-103R	5/14/2021	13.69	14.72	1.03	0.58	unconfined		0.71
BF-103R	5/17/2021	13.69	14.72	1.03	0.58	unconfined		0.71
BF-103R	5/20/2021	13.73	14.75	1.02	0.54	unconfined		0.71
BF-103R	5/25/2021	13.88	14.90	1.02	0.39	unconfined		0.71
BF-103R	6/3/2021	13.64	14.56	0.92	0.66	unconfined		0.71
BF-103R	6/4/2021	13.62	14.55	0.93	0.68	unconfined		0.71
BF-103R	6/14/2021	13.53	14.33	0.80	0.81	unconfined		0.71
BF-103R	6/18/2021	13.36	14.09	0.73	1.00	unconfined		0.71
BF-103R	6/22/2021	13.44	14.13	0.69	0.93	unconfined		0.71
BF-103R	6/23/2021	13.36	14.09	0.73	1.00	unconfined		0.71
BF-103R	6/24/2021	13.55	14.35	0.80	0.79	unconfined		0.71
BF-103R	6/29/2021	13.55	14.35	0.80	0.79	unconfined		0.71
BF-103R	7/1/2021	13.60	14.60	1.00	0.68	unconfined		0.71
BF-103R	7/6/2021	13.49	14.38	0.89	0.82	unconfined		0.71
BF-103R	7/9/2021	13.51	14.41	0.90	0.80	unconfined		0.71
BF-103R	7/13/2021	13.53	14.51	0.98	0.75	unconfined		0.71
BF-103R	7/20/2021	13.36	14.12	0.76	0.99	unconfined		0.71
BF-103R	7/23/2021	13.40	14.12	0.72	0.96	unconfined		0.71

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
BF-103R	7/27/2021	13.44	14.20	0.76	0.91	unconfined		0.71
BF-103R	7/30/2021	13.42	14.26	0.84	0.90	unconfined		0.71
BF-103R	8/3/2021	13.56	14.55	0.99	0.72	unconfined		0.71
BF-103R	8/10/2021	13.63	14.72	1.09	0.62	unconfined		0.71
BF-103R	8/12/2021	13.63	14.72	1.09	0.62	unconfined		0.71
BF-103R	8/13/2021	13.62	14.72	1.10	0.63	unconfined		0.71
BF-103R	8/20/2021	13.70	14.78	1.08	0.56	unconfined		0.71
BF-103R	8/24/2021	13.57	14.59	1.02	0.70	unconfined		0.71
BF-103R	8/27/2021	13.56	14.57	1.01	0.72	unconfined		0.71
BF-103R	9/3/2021	13.13	13.85	0.72	1.23	unconfined		0.71
BF-103R	9/10/2021	13.14	13.84	0.70	1.23	unconfined		0.71
BF-103R	9/16/2021	13.36	14.08	0.72	1.00	unconfined		0.71
BF-103R	9/22/2021	13.32	14.14	0.82	1.01	unconfined		0.71
BF-103R	9/24/2021	13.24	14.06	0.82	1.09	unconfined		0.71
BF-103R	9/29/2021	13.30	14.03	0.73	1.06	unconfined		0.71
BF-103R	10/5/2021	13.38	14.24	0.86	0.94	unconfined		0.71
BF-103R	10/14/2021	13.29	14.15	0.86	1.03	unconfined		0.71
BF-103R	10/21/2021	13.50	14.47	0.97	0.79	unconfined		0.71
BF-103R	10/28/2021	13.37	14.34	0.97	0.92	unconfined		0.71
BF-103R	11/4/2021	13.34	14.09	0.75	1.01	unconfined		0.71
BF-103R	11/11/2021	13.42	14.33	0.91	0.88	unconfined		0.71
BF-103R	11/18/2021	13.56	14.64	1.08	0.69	unconfined		0.71
BF-103R	11/24/2021	13.77	14.89	1.12	0.47	unconfined		0.71
BF-103R	12/22/2021	14.14	15.31	1.17	0.09	unconfined		0.71
BF-103R	12/30/2021	14.17	15.34	1.17	0.06	unconfined		0.71
BF-103R	1/4/2022	14.14	15.24	1.10	0.11	unconfined		0.71
BF-103R	1/12/2022	14.30	15.47	1.17	-0.07	unconfined		0.71
BF-103R	1/25/2022	14.24	15.29	1.05	0.02	unconfined		0.71
BF-103R	2/8/2022	14.24	15.21	0.97	0.05	unconfined		0.71
BF-103R	2/14/2022	14.36	15.40	1.04	-0.09	unconfined		0.71
BF-103R	2/24/2022	14.42	15.45	1.03	-0.15	unconfined		0.71
BF-103R	2/28/2022	14.32	15.29	0.97	-0.03	unconfined		0.71
BF-103R	3/17/2022	14.51	15.60	1.09	-0.26	unconfined		0.71
BF-103R	3/24/2022	14.38	15.36	0.98	-0.10	unconfined		0.71
BF-103R	3/31/2022	14.31	15.19	0.88	0.00	unconfined		0.71
BF-103R	4/8/2022	14.34	15.32	0.98	-0.06	unconfined		0.71
BF-103R	4/12/2022	13.75	14.53	0.78	0.59	unconfined		0.71
BF-103R	4/20/2022	13.77	14.58	0.81	0.56	unconfined		0.71
BF-103R	4/25/2022	13.77	14.55	0.78	0.57	unconfined		0.71
BF-103R	5/2/2022	13.89	14.74	0.85	0.43	unconfined		0.71
BF-103R	5/9/2022	13.61	14.42	0.81	0.72	unconfined		0.71
BF-103R	5/26/2022	13.76	14.54	0.78	0.58	unconfined		0.71
BF-103R	6/15/2022	13.55	14.22	0.67	0.82	unconfined		0.71
BF-103R	7/14/2022	13.89	14.74	0.85	0.43	unconfined		0.71
BF-103R	7/18/2022	13.96	14.83	0.87	0.36	unconfined		0.71
BF-103R	7/26/2022	14.11	15.06	0.95	0.18	unconfined		0.71
BF-103R	8/1/2022	14.13	15.12	0.99	0.15	unconfined		0.71
BF-103R	8/9/2022	14.28	15.32	1.04	-0.01	unconfined		0.71
BF-103R	8/24/2022	14.26	15.31	1.05	0.00	unconfined		0.71
BF-103R	8/29/2022	14.35	15.41	1.06	-0.09	unconfined		0.71
BF-103R	9/8/2022	14.30	15.28	0.98	-0.02	unconfined		0.71
BF-103R	9/22/2022	14.30	15.35	1.05	-0.04	unconfined		0.71
BF-103R	9/28/2022	14.50	15.64	1.14	-0.26	unconfined		0.71
BF-103R	10/5/2022	13.95	14.84	0.89	0.36	unconfined		0.71
BF-103R	10/13/2022	14.10	15.03	0.93	0.20	unconfined		0.71
BF-103R	10/20/2022	14.18	15.10	0.92	0.12	unconfined		0.71
BF-103R	10/27/2022	14.25	15.18	0.93	0.05	unconfined		0.71
BF-103R	11/1/2022	14.27	15.25	0.98	0.01	unconfined		0.71
BF-103R	11/10/2022	14.43	15.46	1.03	-0.16	unconfined		0.71
BF-103R	11/16/2022	14.45	15.45	1.00	-0.17	unconfined		0.71
BF-103R	11/22/2022	14.52	15.54	1.02	-0.25	unconfined		0.71
BF-103R	11/30/2022	14.50	15.49	0.99	-0.22	unconfined		0.71
BF-103R	12/14/2022	13.34	14.05	0.71	1.02	unconfined		0.71
BF-103R	12/21/2022	13.02	13.60	0.58	1.38	unconfined		0.71
BF-103R	12/28/2022	12.98	13.51	0.53	1.43	unconfined		0.71
BF-103R	1/3/2023	12.95	13.47	0.52	1.47	unconfined		0.71
BF-103R	1/10/2023	12.87	13.36	0.49	1.56	unconfined		0.71

Table 3-2
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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
BF-103R	1/19/2023	12.93	13.40	0.47	1.50	unconfined		0.71
BF-103R	1/26/2023	12.99	13.56	0.57	1.41	unconfined		0.71
BF-103R	1/31/2023	13.31	13.88	0.57	1.09	unconfined		0.71
BF-103R	2/7/2023	13.82	14.28	0.46	0.62	unconfined		0.71
BF-103R	2/16/2023	13.89	14.65	0.76	0.46	unconfined		0.71
BF-103R	2/28/2023	13.93	14.60	0.67	0.44	unconfined		0.71
BF-103R	3/7/2023	--	14.10	--	0.47	unconfined	Sparge in well	0.71
BF-103R	3/16/2023	14.19	14.72	0.53	0.22	unconfined		0.71
BF-103R	3/23/2023	14.22	14.80	0.58	0.18	unconfined		0.71
BF-103R	3/29/2023	14.15	14.79	0.64	0.23	unconfined		0.71
BF-103R	4/5/2023	14.29	14.88	0.59	0.11	unconfined		0.71
BF-103R	4/13/2023	14.30	15.05	0.75	0.05	unconfined		0.71
BF-103R	4/19/2023	14.36	15.10	0.74	-0.01	unconfined		0.71
BF-103R	4/26/2023	14.37	15.13	0.76	-0.02	unconfined		0.71
BF-103R	5/3/2023	13.72	14.18	0.46	0.72	unconfined		0.71
BF-103R	5/10/2023	13.89	14.30	0.41	0.56	unconfined		0.71
BF-103R	5/16/2023	13.99	14.50	0.51	0.43	unconfined		0.71
BF-103R	5/23/2023	14.17	14.78	0.61	0.22	unconfined		0.71
BF-103R	5/31/2023	14.30	14.96	0.66	0.08	unconfined		0.71
BF-103R	6/7/2023	14.30	14.85	0.55	0.11	unconfined		0.71
BF-103R	6/20/2023	14.45	15.01	0.56	-0.04	unconfined		0.71
BF-103R	6/27/2023	--	--	--	--	unconfined	Sparge in well	0.71
BF-103R	7/19/2023	--	13.68	--	0.89	unconfined		0.71
BF-103R	7/26/2023	--	12.36	--	2.21	unconfined		0.71
BF-103R	8/2/2023	--	13.50	--	1.07	unconfined		0.71
BF-103R	8/9/2023	--	13.44	--	1.13	unconfined		0.71
BF-103R	9/5/2023	--	13.98	--	0.59	unconfined		0.71
BF-103R	9/15/2023	--	13.94	--	0.63	unconfined		0.71
BF-103R	9/20/2023	--	13.88	--	0.69	unconfined		0.71
BF-103R	9/27/2023	--	13.39	--	1.18	unconfined		0.71
BF-103R	10/4/2023	--	13.39	--	1.18	unconfined		0.71
BF-103R	10/17/2023	--	13.63	--	0.94	unconfined		0.71
BF-103R	10/26/2023	--	13.96	--	0.61	unconfined		0.71
BF-103R	11/1/2023	--	14.03	--	0.54	unconfined		0.71
BF-103R	11/9/2023	--	14.08	--	0.49	unconfined		0.71
BF-103R	11/13/2023	--	14.25	--	0.32	unconfined		0.71
BF-103R	11/22/2023	--	14.19	--	0.38	unconfined		0.71
BF-103R	11/29/2023	--	14.18	--	0.39	unconfined		0.71
BF-103R	12/14/2023	--	13.85	--	0.72	unconfined		0.71
BF-103R	12/20/2023	--	13.27	--	1.30	unconfined		0.71
BF-103R	1/11/2024	--	12.50	--	2.07	unconfined		0.71
BF-103R	1/18/2024	--	12.56	--	2.01	unconfined		0.71
BF-103R	1/24/2024	--	13.03	--	1.54	unconfined		0.71
BF-103R	1/30/2024	--	12.50	--	2.07	unconfined		0.71
BF-103R	2/5/2024	--	12.54	--	2.03	unconfined		0.71
BF-103R	2/15/2024	12.86	12.87	0.01	1.71	unconfined		0.71
BF-103R	2/21/2024	--	13.18	--	1.39	unconfined		0.71
BF-103R	2/28/2024	--	13.22	--	1.35	unconfined		0.71
BF-103R	3/5/2024	--	13.27	--	1.30	unconfined		0.71
BF-103R	3/20/2024	12.93	12.95	0.02	1.63	unconfined		0.71
BF-103R	3/28/2024	--	12.59	--	1.98	unconfined		0.71
BF-103R	4/3/2024	--	12.39	--	2.18	unconfined		0.71
BF-103R	4/9/2024	--	12.13	--	2.44	unconfined		0.71
BF-103R	4/25/2024	--	12.64	--	1.93	unconfined		0.71
BF-103R	4/30/2024	--	12.69	--	1.88	unconfined		0.71
BF-103R	5/8/2024	--	12.85	--	1.72	unconfined		0.71
BF-103R	5/20/2024	--	13.11	--	1.46	unconfined		0.71
BF-103R	5/31/2024	--	13.40	--	1.17	unconfined		0.71
BF-103R	6/5/2024	--	13.49	--	1.08	unconfined		0.71
BF-103R	6/12/2024	--	13.48	--	1.09	unconfined		0.71
BF-103R	6/19/2024	--	13.68	--	0.89	unconfined		0.71
BF-103R	6/26/2024	--	13.79	--	0.78	unconfined		0.71
BF-103R	7/2/2024	--	13.71	--	0.86	unconfined		0.71
BF-103R	7/10/2024	--	13.53	--	1.04	unconfined		0.71
BF-103R	7/16/2024	--	13.49	--	1.08	unconfined		0.71
BF-103R	7/24/2024	--	13.75	--	0.82	unconfined		0.71
BF-103R	8/1/2024	--	13.93	--	0.64	unconfined		0.71

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
BF-103R	8/6/2024	--	13.75	--	0.82	unconfined		0.71
BF-103R	8/23/2024	--	13.03	--	1.54	unconfined		0.71
BF-103R	8/28/2024	--	13.24	--	1.33	unconfined		0.71
BF-103R	8/28/2024	--	13.24	--	1.33	unconfined		0.71
BF-103R	9/4/2024	--	13.54	--	1.03	unconfined		0.71
BF-103R	9/11/2024	--	13.73	--	0.84	unconfined		0.71
BF-103R	9/18/2024	--	13.84	--	0.73	unconfined		0.71
BF-103R	9/25/2024	--	13.85	--	0.72	unconfined		0.71
BF-103R	10/1/2024	--	13.95	--	0.62	unconfined		0.71
BF-103R	10/14/2024	--	14.33	--	0.24	unconfined		0.71
BF-103R	10/28/2024	--	14.72	--	-0.15	unconfined		0.71
BF-103R	11/8/2024	--	--	--	--	unconfined	Well abandoned	0.71
C-169	9/5/2023	4.90	4.91	0.01	2.07	unconfined	Black product	0.87
C-169	9/13/2023	4.50	4.51	0.01	2.47	unconfined		0.87
C-169	9/20/2023	4.59	4.60	0.01	2.38	unconfined	Black product	0.87
C-169	9/27/2023	--	4.34	--	2.63	unconfined	Black film	0.87
C-169	10/4/2023	4.56	4.57	0.01	2.41	unconfined	Black product	0.87
C-169	10/18/2023	4.63	4.64	0.01	2.34	unconfined	Black product	0.87
C-169	10/27/2023	4.96	4.98	0.02	2.01	unconfined	Black product	0.87
C-169	11/1/2023	5.02	5.03	0.01	1.95	unconfined	Black product	0.87
C-169	11/9/2023	5.18	5.19	0.01	1.79	unconfined	Black product	0.87
C-169	11/13/2023	5.20	5.21	0.01	1.77	unconfined	Black product	0.87
C-169	11/22/2023	--	4.13	--	2.84	unconfined		0.87
C-169	11/29/2023	--	4.31	--	2.66	unconfined	Black film	0.87
C-169	12/14/2023	3.90	3.90	--	3.07	unconfined	Black product	0.87
C-169	12/20/2023	--	2.25	--	4.72	unconfined		0.87
C-169	1/18/2024	3.09	3.10	0.01	3.88	unconfined	Black product	0.87
C-169	1/24/2024	3.77	3.77	--	3.20	unconfined	Black sheen	0.87
C-169	1/30/2024	3.45	3.46	0.01	3.52	unconfined	Black product	0.87
C-169	2/5/2024	4.21	4.22	0.01	2.76	unconfined		0.87
C-169	2/15/2024	4.35	4.36	0.01	2.62	unconfined	Black product	0.87
C-169	2/21/2024	4.40	4.41	0.01	2.57	unconfined		0.87
C-169	2/28/2024	4.30	4.31	0.01	2.67	unconfined		0.87
C-169	3/20/2024	4.10	4.11	0.01	2.87	unconfined		0.87
C-169	3/28/2024	--	--	--	--	unconfined	Unable to access	0.87
C-169	4/9/2024	--	3.20	--	3.77	unconfined		0.87
C-169	4/30/2024	2.01	2.02	0.01	4.96	unconfined		0.87
C-169	5/20/2024	2.49	2.50	0.01	4.48	unconfined		0.87
C-169	5/31/2024	3.00	3.02	0.02	3.97	unconfined		0.87
C-169	6/5/2024	3.24	3.25	0.01	3.73	unconfined		0.87
C-169	6/12/2024	2.30	2.31	0.01	4.67	unconfined		0.87
C-169	6/26/2024	3.30	3.31	0.01	3.67	unconfined		0.87
C-169	7/10/2024	2.80	2.81	0.01	4.17	unconfined		0.87
C-169	7/16/2024	2.98	2.99	0.01	3.99	unconfined		0.87
C-169	7/24/2024	--	3.48	--	3.49	unconfined		0.87
C-169	8/1/2024	--	3.72	--	3.25	unconfined		0.87
C-169	8/6/2024	--	3.25	--	3.72	unconfined		0.87
C-169	8/23/2024	--	2.85	--	4.12	unconfined		0.87
C-169	8/28/2024	--	3.08	--	3.89	unconfined		0.87
C-169	9/4/2024	--	3.47	--	3.50	unconfined		0.87
C-169	9/11/2024	--	3.72	--	3.25	unconfined		0.87
C-169	9/18/2024	--	3.90	--	3.07	unconfined		0.87
C-169	9/25/2024	--	4.05	--	2.92	unconfined		0.87
C-169	10/1/2024	--	4.14	--	2.83	unconfined		0.87
C-169	10/28/2024	--	4.65	--	2.32	unconfined		0.87
C-169	11/8/2024	--	--	--	--	unconfined	Unable to access	0.87
C-169	11/26/2024	--	--	--	--	unconfined	Unable to access	0.87
S-283	6/19/2018	9.88	11.70	1.82	0.80	unconfined		0.75
S-283	7/26/2018	10.35	12.60	2.25	0.22	unconfined		0.75
S-283	7/26/2018	10.26	12.53	2.27	0.30	unconfined		0.75
S-283	7/30/2018	10.34	12.69	2.35	0.20	unconfined		0.75
S-283	8/1/2018	10.25	12.65	2.40	0.28	unconfined		0.75
S-283	8/2/2018	10.30	12.65	2.35	0.24	unconfined		0.75
S-283	8/16/2018	10.25	12.63	2.38	0.28	unconfined		0.75
S-283	8/29/2018	10.29	12.90	2.61	0.19	unconfined		0.75
S-283	9/5/2018	11.05	13.80	2.75	-0.61	unconfined		0.75
S-283	9/6/2018	10.48	12.84	2.36	0.06	unconfined		0.75

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-283	9/7/2018	10.72	13.21	2.49	-0.21	unconfined		0.75
S-283	9/10/2018	10.72	12.86	2.14	-0.12	unconfined		0.75
S-283	9/13/2018	9.97	11.21	1.24	0.85	unconfined		0.75
S-283	9/17/2018	10.20	12.35	2.15	0.39	unconfined		0.75
S-283	9/17/2018	9.75	11.85	2.10	0.86	unconfined		0.75
S-283	9/21/2018	9.98	12.25	2.27	0.59	unconfined		0.75
S-283	9/25/2018	10.13	11.13	1.00	0.76	unconfined		0.75
S-283	9/26/2018	10.05	12.10	2.05	0.57	unconfined		0.75
S-283	9/26/2018	10.05	12.10	2.05	0.57	unconfined		0.75
S-283	9/27/2018	10.08	12.11	2.03	0.54	unconfined		0.75
S-283	10/2/2018	9.95	12.35	2.40	0.58	unconfined		0.75
S-283	10/3/2018	9.98	12.37	2.39	0.55	unconfined		0.75
S-283	10/22/2018	10.55	12.60	2.05	0.07	unconfined		0.75
S-283	10/23/2018	10.19	12.60	2.41	0.34	unconfined		0.75
S-283	11/26/2018	9.64	11.42	1.78	1.05	unconfined		0.75
S-283	5/16/2019	9.85	10.57	0.72	1.11	unconfined		0.75
S-283	9/5/2019	10.34	10.88	0.54	0.66	unconfined		0.75
S-283	10/18/2019	10.71	11.87	1.16	0.14	unconfined		0.75
S-283	10/25/2019	10.92	11.65	0.73	0.03	unconfined		0.75
S-283	11/1/2019	10.95	11.92	0.97	-0.06	unconfined		0.75
S-283	12/16/2019	10.95	11.90	0.95	-0.05	unconfined		0.75
S-283	1/7/2020	11.16	11.29	0.13	-0.05	unconfined		0.75
S-283	1/10/2020	11.51	11.56	0.05	-0.38	unconfined		0.75
S-283	1/13/2020	11.48	11.59	0.11	-0.37	unconfined		0.75
S-283	1/22/2020	--	11.42	--	-0.28	unconfined		0.75
S-283	1/24/2020	11.48	11.53	0.05	-0.35	unconfined		0.75
S-283	1/27/2020	10.73	12.33	1.60	0.00	unconfined		0.75
S-283	1/28/2020	10.72	12.34	1.62	0.01	unconfined		0.75
S-283	1/30/2020	10.73	12.42	1.69	-0.02	unconfined		0.75
S-283	1/31/2020	10.82	12.33	1.51	-0.06	unconfined		0.75
S-283	2/3/2020	10.74	12.40	1.66	-0.02	unconfined		0.75
S-283	2/4/2020	10.99	11.05	0.06	0.14	unconfined		0.75
S-283	2/6/2020	10.99	11.05	0.06	0.14	unconfined		0.75
S-283	2/7/2020	10.93	11.07	0.14	0.18	unconfined		0.75
S-283	2/13/2020	12.16	12.23	0.07	-1.04	unconfined		0.75
S-283	2/21/2020	10.81	12.76	1.95	-0.17	unconfined		0.75
S-283	2/24/2020	10.73	10.77	0.04	0.40	unconfined		0.75
S-283	2/25/2020	10.99	11.99	1.00	-0.10	unconfined		0.75
S-283	2/27/2020	10.98	12.01	1.03	-0.10	unconfined		0.75
S-283	2/28/2020	10.78	12.01	1.23	0.05	unconfined		0.75
S-283	3/2/2020	10.88	12.31	1.43	-0.10	unconfined		0.75
S-283	3/16/2020	10.91	12.96	2.05	-0.29	unconfined		0.75
S-283	3/17/2020	10.91	12.96	2.05	-0.29	unconfined		0.75
S-283	3/20/2020	11.05	11.70	0.65	-0.07	unconfined		0.75
S-283	3/23/2020	10.83	11.30	0.47	0.19	unconfined		0.75
S-283	3/24/2020	11.20	11.76	0.56	-0.20	unconfined		0.75
S-283	3/26/2020	11.13	11.41	0.28	-0.06	unconfined		0.75
S-283	4/2/2020	10.72	10.76	0.04	0.41	unconfined		0.75
S-283	4/16/2020	10.46	11.53	1.07	0.41	unconfined		0.75
S-283	4/21/2020	10.38	11.96	1.58	0.36	unconfined		0.75
S-283	4/23/2020	10.61	11.71	1.10	0.25	unconfined		0.75
S-283	4/24/2020	10.46	11.81	1.35	0.34	unconfined		0.75
S-283	4/30/2020	10.68	11.15	0.47	0.34	unconfined		0.75
S-283	5/18/2020	11.02	11.20	0.18	0.08	unconfined		0.75
S-283	5/19/2020	10.91	11.60	0.69	0.06	unconfined		0.75
S-283	5/21/2020	11.11	11.92	0.81	-0.18	unconfined		0.75
S-283	5/22/2020	11.10	11.93	0.83	-0.17	unconfined		0.75
S-283	5/26/2020	10.99	11.91	0.92	-0.08	unconfined		0.75
S-283	5/27/2020	11.01	11.46	0.45	0.02	unconfined		0.75
S-283	5/28/2020	11.04	11.29	0.25	0.04	unconfined		0.75
S-283	5/29/2020	11.00	11.34	0.34	0.05	unconfined		0.75
S-283	6/5/2020	11.03	11.57	0.54	-0.03	unconfined		0.75
S-283	6/8/2020	10.67	11.65	0.98	0.22	unconfined		0.75
S-283	6/9/2020	10.72	11.60	0.88	0.20	unconfined		0.75
S-283	6/11/2020	11.05	11.14	0.09	0.07	unconfined		0.75
S-283	6/12/2020	11.03	11.12	0.09	0.09	unconfined		0.75
S-283	6/26/2020	10.88	11.77	0.89	0.03	unconfined		0.75

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-283	6/29/2020	10.90	11.73	0.83	0.03	unconfined		0.75
S-283	7/1/2020	10.93	11.70	0.77	0.01	unconfined		0.75
S-283	7/7/2020	11.00	11.75	0.75	-0.05	unconfined		0.75
S-283	7/13/2020	10.63	11.99	1.36	0.16	unconfined		0.75
S-283	7/16/2020	10.50	11.70	1.20	0.34	unconfined		0.75
S-283	7/21/2020	10.50	10.81	0.31	0.56	unconfined		0.75
S-283	7/22/2020	10.73	12.41	1.68	-0.02	unconfined		0.75
S-283	7/23/2020	10.61	12.32	1.71	0.10	unconfined		0.75
S-283	7/24/2020	10.65	12.39	1.74	0.05	unconfined		0.75
S-283	7/27/2020	10.63	12.28	1.65	0.09	unconfined		0.75
S-283	7/28/2020	10.90	11.50	0.60	0.09	unconfined		0.75
S-283	7/30/2020	10.96	11.76	0.80	-0.02	unconfined		0.75
S-283	7/31/2020	11.00	11.97	0.97	-0.11	unconfined		0.75
S-283	8/3/2020	10.96	12.16	1.20	-0.12	unconfined		0.75
S-283	8/4/2020	10.95	12.22	1.27	-0.13	unconfined		0.75
S-283	8/6/2020	10.55	11.40	0.85	0.37	unconfined		0.75
S-283	8/10/2020	10.59	10.79	0.20	0.50	unconfined		0.75
S-283	8/11/2020	10.52	11.30	0.78	0.42	unconfined		0.75
S-283	8/13/2020	10.72	10.75	0.03	0.41	unconfined		0.75
S-283	8/18/2020	10.25	11.48	1.23	0.58	unconfined		0.75
S-283	8/19/2020	10.34	11.23	0.89	0.57	unconfined		0.75
S-283	8/24/2020	10.85	11.01	0.16	0.25	unconfined		0.75
S-283	8/27/2020	10.90	11.07	0.17	0.20	unconfined		0.75
S-283	8/31/2020	10.52	11.75	1.23	0.31	unconfined		0.75
S-283	9/1/2020	10.98	11.11	0.13	0.13	unconfined		0.75
S-283	9/3/2020	10.61	11.93	1.32	0.19	unconfined		0.75
S-283	9/8/2020	10.72	11.85	1.13	0.13	unconfined		0.75
S-283	11/2/2020	10.70	11.90	1.20	0.14	unconfined		0.75
S-283	12/4/2020	10.65	11.45	0.80	0.29	unconfined		0.75
S-283	2/12/2021	10.71	11.08	0.37	0.34	unconfined		0.75
S-283	12/22/2021	10.80	12.64	1.84	-0.13	unconfined		0.75
S-283	12/22/2021	10.80	12.64	1.84	-0.13	unconfined		0.75
S-283	1/4/2022	10.88	12.77	1.89	-0.22	unconfined		0.75
S-283	1/12/2022	10.87	12.60	1.73	-0.17	unconfined		0.75
S-283	1/25/2022	10.84	12.60	1.76	-0.15	unconfined		0.75
S-283	2/8/2022	10.90	12.44	1.54	-0.15	unconfined		0.75
S-283	2/14/2022	11.06	12.97	1.91	-0.41	unconfined		0.75
S-283	2/24/2022	11.02	12.73	1.71	-0.31	unconfined		0.75
S-283	2/28/2022	11.14	13.01	1.87	-0.48	unconfined		0.75
S-283	3/17/2022	11.23	13.15	1.92	-0.58	unconfined		0.75
S-283	3/24/2022	11.39	12.85	1.46	-0.62	unconfined		0.75
S-283	3/31/2022	10.98	12.68	1.70	-0.27	unconfined		0.75
S-283	4/8/2022	11.04	12.73	1.69	-0.33	unconfined		0.75
S-283	4/12/2022	10.50	11.79	1.29	0.31	unconfined		0.75
S-283	4/20/2022	10.52	11.74	1.22	0.31	unconfined		0.75
S-283	4/25/2022	10.43	11.80	1.37	0.36	unconfined		0.75
S-283	5/2/2022	10.60	12.23	1.63	0.13	unconfined		0.75
S-283	5/9/2022	10.33	11.68	1.35	0.47	unconfined		0.75
S-283	5/26/2022	10.41	11.99	1.58	0.33	unconfined		0.75
S-283	6/15/2022	10.22	11.60	1.38	0.57	unconfined		0.75
S-283	7/14/2022	10.56	12.44	1.88	0.10	unconfined		0.75
S-283	7/18/2022	10.47	12.15	1.68	0.24	unconfined		0.75
S-283	7/26/2022	10.65	12.50	1.85	0.02	unconfined		0.75
S-283	8/1/2022	10.75	12.55	1.80	-0.07	unconfined		0.75
S-283	8/9/2022	10.84	12.69	1.85	-0.17	unconfined		0.75
S-283	8/24/2022	10.70	12.42	1.72	0.00	unconfined		0.75
S-283	8/29/2022	10.93	12.81	1.88	-0.27	unconfined		0.75
S-283	9/8/2022	10.92	12.65	1.73	-0.22	unconfined		0.75
S-283	9/22/2022	10.78	12.70	1.92	-0.13	unconfined		0.75
S-283	9/28/2022	11.05	12.98	1.93	-0.40	unconfined		0.75
S-283	10/5/2022	10.41	12.00	1.59	0.33	unconfined		0.75
S-283	10/13/2022	10.95	11.44	0.49	0.07	unconfined	Sparge in well	0.75
S-283	10/20/2022	--	--	--	--	unconfined	Sparge in well	0.75
S-283	10/27/2022	--	--	--	--	unconfined	Sparge in well	0.75
S-283	11/1/2022	--	--	--	--	unconfined	Sparge in well	0.75
S-283	11/10/2022	11.38	12.75	1.37	-0.59	unconfined		0.75
S-283	11/16/2022	--	--	--	--	unconfined	Sparge in well	0.75

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S-283	11/22/2022	11.18	13.40	2.22	-0.60	unconfined		0.75
S-283	11/30/2022	10.98	12.80	1.82	-0.30	unconfined		0.75
S-283	12/14/2022	10.05	11.20	1.15	0.80	unconfined		0.75
S-283	12/21/2022	9.95	10.92	0.97	0.94	unconfined		0.75
S-283	12/28/2022	9.90	10.58	0.68	1.07	unconfined		0.75
S-283	1/3/2023	9.85	10.70	0.85	1.07	unconfined		0.75
S-283	1/10/2023	9.77	10.79	1.02	1.11	unconfined		0.75
S-283	1/19/2023	9.70	10.66	0.96	1.20	unconfined		0.75
S-283	1/26/2023	9.74	11.20	1.46	1.03	unconfined		0.75
S-283	1/31/2023	10.03	11.54	1.51	0.73	unconfined		0.75
S-283	2/7/2023	10.53	12.45	1.92	0.12	unconfined		0.75
S-283	2/16/2023	10.46	12.22	1.76	0.23	unconfined		0.75
S-283	2/28/2023	10.44	11.80	1.36	0.35	unconfined		0.75
S-283	3/7/2023	10.53	11.90	1.37	0.26	unconfined		0.75
S-283	3/16/2023	10.69	12.28	1.59	0.05	unconfined		0.75
S-283	3/23/2023	10.75	12.25	1.50	0.01	unconfined		0.75
S-283	3/29/2023	10.75	12.15	1.40	0.03	unconfined		0.75
S-283	4/5/2023	10.96	12.42	1.46	-0.19	unconfined		0.75
S-283	4/13/2023	10.89	12.25	1.36	-0.10	unconfined		0.75
S-283	4/19/2023	10.96	12.33	1.37	-0.17	unconfined		0.75
S-283	4/26/2023	10.94	12.33	1.39	-0.15	unconfined		0.75
S-283	5/3/2023	10.50	11.40	0.90	0.41	unconfined		0.75
S-283	5/10/2023	10.57	11.52	0.95	0.33	unconfined		0.75
S-283	5/16/2023	10.72	11.88	1.16	0.13	unconfined		0.75
S-283	5/23/2023	10.80	12.00	1.20	0.04	unconfined		0.75
S-283	5/31/2023	10.87	12.12	1.25	-0.05	unconfined		0.75
S-283	6/7/2023	10.96	12.21	1.25	-0.14	unconfined		0.75
S-283	6/20/2023	11.04	12.29	1.25	-0.22	unconfined		0.75
S-283	6/27/2023	10.82	11.84	1.02	0.06	unconfined		0.75
S-283	7/19/2023	10.08	10.75	0.67	0.89	unconfined		0.75
S-283	7/26/2023	10.00	10.72	0.72	0.96	unconfined		0.75
S-283	8/2/2023	10.29	10.93	0.64	0.69	unconfined		0.75
S-283	8/9/2023	10.03	10.84	0.81	0.90	unconfined		0.75
S-283	8/23/2023	10.29	11.08	0.79	0.65	unconfined		0.75
S-283	8/30/2023	10.32	11.10	0.78	0.62	unconfined		0.75
S-283	9/5/2023	10.53	11.20	0.67	0.44	unconfined		0.75
S-283	9/15/2023	10.64	11.18	0.54	0.36	unconfined		0.75
S-283	9/20/2023	10.53	11.20	0.67	0.44	unconfined		0.75
S-283	9/27/2023	9.79	10.43	0.64	1.19	unconfined		0.75
S-283	10/4/2023	9.89	10.71	0.82	1.04	unconfined		0.75
S-283	10/17/2023	10.34	10.60	0.26	0.73	unconfined		0.75
S-283	10/26/2023	10.64	10.79	0.15	0.46	unconfined		0.75
S-283	11/1/2023	10.74	10.90	0.16	0.36	unconfined		0.75
S-283	11/9/2023	10.58	11.03	0.45	0.45	unconfined		0.75
S-283	11/13/2023	10.82	11.33	0.51	0.19	unconfined		0.75
S-283	11/22/2023	10.43	11.90	1.47	0.34	unconfined		0.75
S-283	11/27/2023	10.67	11.40	0.73	0.28	unconfined		0.75
S-283	11/29/2023	10.92	11.20	0.28	0.15	unconfined		0.75
S-283	12/14/2023	10.55	10.95	0.40	0.49	unconfined		0.75
S-283	12/20/2023	9.92	10.00	0.08	1.20	unconfined		0.75
S-283	1/3/2024	9.52	9.62	0.10	1.60	unconfined		0.75
S-283	1/11/2024	9.27	9.41	0.14	1.84	unconfined		0.75
S-283	1/18/2024	9.30	9.42	0.12	1.81	unconfined		0.75
S-283	1/24/2024	9.84	9.90	0.06	1.29	unconfined		0.75
S-283	1/30/2024	9.36	9.46	0.10	1.76	unconfined		0.75
S-283	2/5/2024	9.23	9.40	0.17	1.87	unconfined		0.75
S-283	2/15/2024	9.75	9.81	0.06	1.38	unconfined		0.75
S-283	2/21/2024	9.93	9.97	0.04	1.20	unconfined		0.75
S-283	2/28/2024	10.04	10.08	0.04	1.09	unconfined		0.75
S-283	3/5/2024	10.00	10.01	0.01	1.14	unconfined		0.75
S-283	3/20/2024	9.70	9.71	0.01	1.44	unconfined		0.75
S-283	3/28/2024	9.42	9.43	0.01	1.72	unconfined		0.75
S-283	4/3/2024	--	--	--	--	unconfined	Unable to access	0.75
S-283	4/9/2024	--	8.88	--	2.26	unconfined		0.75
S-283	4/25/2024	9.53	9.54	0.01	1.61	unconfined	Area flooded	0.75
S-283	4/30/2024	9.41	9.42	0.01	1.73	unconfined		0.75
S-283	5/8/2024	9.67	9.68	0.01	1.47	unconfined		0.75

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-283	5/20/2024	9.84	9.86	0.02	1.30	unconfined		0.75
S-283	5/31/2024	10.13	10.15	0.02	1.01	unconfined		0.75
S-283	6/5/2024	10.23	10.35	0.12	0.88	unconfined		0.75
S-283	6/12/2024	10.19	10.20	0.01	0.95	unconfined		0.75
S-283	6/19/2024	10.42	10.46	0.04	0.71	unconfined		0.75
S-283	6/26/2024	10.48	10.55	0.07	0.64	unconfined		0.75
S-283	7/2/2024	10.40	10.44	0.04	0.73	unconfined		0.75
S-283	7/10/2024	10.18	10.20	0.02	0.96	unconfined		0.75
S-283	7/16/2024	10.22	10.23	0.01	0.92	unconfined		0.75
S-283	7/24/2024	10.48	10.55	0.07	0.64	unconfined		0.75
S-283	8/1/2024	10.64	10.95	0.31	0.42	unconfined		0.75
S-283	8/6/2024	10.55	11.00	0.45	0.48	unconfined		0.75
S-283	8/23/2024	9.85	10.13	0.28	1.22	unconfined		0.75
S-283	8/28/2024	9.90	10.54	0.64	1.08	unconfined		0.75
S-283	9/4/2024	10.24	10.78	0.54	0.76	unconfined		0.75
S-283	9/11/2024	10.40	10.70	0.30	0.66	unconfined		0.75
S-283	9/18/2024	10.55	10.92	0.37	0.50	unconfined		0.75
S-283	9/25/2024	10.40	10.80	0.40	0.64	unconfined		0.75
S-283	10/1/2024	10.54	10.98	0.44	0.49	unconfined		0.75
S-283	10/14/2024	10.82	11.58	0.76	0.13	unconfined		0.75
S-283	10/28/2024	--	--	--	--	unconfined	Unable to access	0.75
S-283	11/8/2024	--	--	--	--	unconfined	Destroyed	0.75
S-382	6/19/2018	15.84	18.92	3.08	3.64	unconfined		0.73
S-382	6/29/2018	16.08	19.29	3.21	3.37	unconfined		0.73
S-382	7/26/2018	16.29	19.61	3.32	3.13	unconfined		0.73
S-382	7/26/2018	16.19	19.82	3.63	3.14	unconfined		0.73
S-382	7/30/2018	16.33	19.38	3.05	3.16	unconfined		0.73
S-382	8/1/2018	16.34	19.42	3.08	3.14	unconfined		0.73
S-382	8/2/2018	16.37	19.47	3.10	3.11	unconfined		0.73
S-382	8/16/2018	16.31	19.28	2.97	3.20	unconfined		0.73
S-382	8/29/2018	16.41	19.38	2.97	3.10	unconfined		0.73
S-382	9/5/2018	17.10	19.70	2.60	2.51	unconfined		0.73
S-382	9/6/2018	17.11	20.21	3.10	2.37	unconfined		0.73
S-382	9/7/2018	17.03	20.19	3.16	2.43	unconfined		0.73
S-382	9/10/2018	17.21	18.13	0.92	2.86	unconfined		0.73
S-382	9/13/2018	15.73	18.05	2.32	3.96	unconfined		0.73
S-382	9/17/2018	16.32	18.15	1.83	3.50	unconfined		0.73
S-382	9/17/2018	15.85	18.43	2.58	3.77	unconfined		0.73
S-382	9/21/2018	16.48	18.87	2.39	3.19	unconfined		0.73
S-382	9/26/2018	16.53	18.68	2.15	3.20	unconfined		0.73
S-382	9/27/2018	16.56	18.68	2.12	3.18	unconfined		0.73
S-382	10/1/2018	16.53	18.42	1.89	3.27	unconfined		0.73
S-382	3/13/2019	15.95	17.60	1.65	3.92	unconfined		0.73
S-382	3/20/2019	16.18	18.07	1.89	3.62	unconfined		0.73
S-382	3/21/2019	16.20	18.10	1.90	3.60	unconfined		0.73
S-382	3/22/2019	16.01	17.66	1.65	3.86	unconfined		0.73
S-382	3/25/2019	15.24	17.98	2.74	4.33	unconfined		0.73
S-382	3/26/2019	16.30	17.95	1.65	3.57	unconfined		0.73
S-382	3/29/2019	16.22	18.24	2.02	3.55	unconfined		0.73
S-382	4/2/2019	16.41	18.12	1.71	3.44	unconfined		0.73
S-382	4/4/2019	16.46	18.24	1.78	3.37	unconfined		0.73
S-382	4/9/2019	16.35	17.94	1.59	3.54	unconfined		0.73
S-382	4/10/2019	16.37	18.02	1.65	3.50	unconfined		0.73
S-382	4/11/2019	16.60	17.73	1.13	3.41	unconfined		0.73
S-382	4/12/2019	16.55	17.79	1.24	3.43	unconfined		0.73
S-382	4/16/2019	16.63	17.52	0.89	3.45	unconfined		0.73
S-382	4/18/2019	16.75	17.55	0.80	3.35	unconfined		0.73
S-382	4/19/2019	16.52	17.76	1.24	3.46	unconfined		0.73
S-382	4/22/2019	16.48	17.95	1.47	3.44	unconfined		0.73
S-382	4/23/2019	16.50	17.55	1.05	3.53	unconfined		0.73
S-382	4/24/2019	16.43	17.59	1.16	3.57	unconfined		0.73
S-382	4/25/2019	16.48	17.55	1.07	3.55	unconfined		0.73
S-382	4/26/2019	16.37	17.56	1.19	3.62	unconfined		0.73
S-382	4/29/2019	16.57	17.55	0.98	3.48	unconfined		0.73
S-382	4/30/2019	16.65	17.50	0.85	3.44	unconfined		0.73
S-382	5/1/2019	16.70	17.50	0.80	3.40	unconfined		0.73
S-382	5/3/2019	16.76	17.42	0.66	3.38	unconfined		0.73

Table 3-2
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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-382	5/6/2019	16.64	17.46	0.82	3.46	unconfined		0.73
S-382	5/10/2019	16.55	17.46	0.91	3.52	unconfined		0.73
S-382	5/14/2019	16.25	16.99	0.74	3.87	unconfined		0.73
S-382	5/15/2019	16.25	16.95	0.70	3.88	unconfined		0.73
S-382	5/16/2019	16.03	17.20	1.17	3.97	unconfined		0.73
S-382	5/17/2019	16.26	16.43	0.17	4.01	unconfined		0.73
S-382	5/20/2019	16.07	17.78	1.71	3.78	unconfined		0.73
S-382	5/21/2019	15.19	17.09	1.90	4.61	unconfined		0.73
S-382	5/22/2019	15.61	16.93	1.32	4.35	unconfined		0.73
S-382	5/23/2019	16.57	16.95	0.38	3.64	unconfined		0.73
S-382	5/24/2019	16.58	16.91	0.33	3.65	unconfined		0.73
S-382	5/28/2019	16.33	17.53	1.20	3.66	unconfined		0.73
S-382	5/29/2019	16.53	17.23	0.70	3.60	unconfined		0.73
S-382	5/31/2019	15.01	17.45	2.44	4.64	unconfined		0.73
S-382	6/3/2019	16.60	17.35	0.75	3.51	unconfined		0.73
S-382	6/4/2019	16.75	17.13	0.38	3.46	unconfined		0.73
S-382	6/5/2019	16.75	16.98	0.23	3.51	unconfined		0.73
S-382	6/6/2019	16.60	17.10	0.50	3.58	unconfined		0.73
S-382	6/10/2019	16.70	17.32	0.62	3.45	unconfined		0.73
S-382	6/11/2019	16.75	17.22	0.47	3.44	unconfined		0.73
S-382	6/12/2019	16.69	17.39	0.70	3.44	unconfined		0.73
S-382	6/13/2019	16.71	17.30	0.59	3.45	unconfined		0.73
S-382	6/14/2019	16.72	17.04	0.32	3.51	unconfined		0.73
S-382	6/17/2019	16.80	17.01	0.21	3.46	unconfined		0.73
S-382	6/18/2019	16.57	17.22	0.65	3.57	unconfined		0.73
S-382	6/19/2019	16.65	17.05	0.40	3.56	unconfined		0.73
S-382	6/20/2019	16.48	16.53	0.05	3.82	unconfined		0.73
S-382	6/24/2019	15.58	16.61	1.03	4.46	unconfined		0.73
S-382	6/25/2019	15.78	16.67	0.89	4.30	unconfined		0.73
S-382	6/26/2019	16.21	16.40	0.19	4.06	unconfined		0.73
S-382	6/27/2019	16.38	16.39	0.01	3.94	unconfined		0.73
S-382	6/28/2019	16.15	16.53	0.38	4.06	unconfined		0.73
S-382	7/1/2019	16.11	17.11	1.00	3.94	unconfined		0.73
S-382	7/2/2019	16.15	17.15	1.00	3.90	unconfined		0.73
S-382	7/3/2019	16.15	17.23	1.08	3.87	unconfined		0.73
S-382	7/5/2019	16.16	17.25	1.09	3.86	unconfined		0.73
S-382	7/8/2019	15.80	16.82	1.02	4.24	unconfined		0.73
S-382	7/9/2019	15.83	16.75	0.92	4.24	unconfined		0.73
S-382	7/10/2019	15.78	17.56	1.78	4.05	unconfined		0.73
S-382	7/11/2019	15.88	16.90	1.02	4.16	unconfined		0.73
S-382	7/12/2019	15.83	16.95	1.12	4.18	unconfined		0.73
S-382	7/15/2019	15.89	16.96	1.07	4.14	unconfined		0.73
S-382	7/17/2019	16.00	17.01	1.01	4.04	unconfined		0.73
S-382	7/18/2019	15.96	17.15	1.19	4.03	unconfined		0.73
S-382	7/19/2019	16.00	17.05	1.05	4.03	unconfined		0.73
S-382	7/22/2019	16.08	17.05	0.97	3.97	unconfined		0.73
S-382	7/24/2019	16.02	17.10	1.08	4.00	unconfined		0.73
S-382	7/25/2019	16.04	17.11	1.07	3.99	unconfined		0.73
S-382	7/26/2019	16.11	17.03	0.92	3.96	unconfined		0.73
S-382	7/29/2019	16.20	17.27	1.07	3.83	unconfined		0.73
S-382	8/2/2019	16.20	17.60	1.40	3.74	unconfined		0.73
S-382	8/12/2019	16.23	17.23	1.00	3.82	unconfined		0.73
S-382	8/16/2019	16.33	17.38	1.05	3.70	unconfined		0.73
S-382	8/19/2019	16.35	17.43	1.08	3.67	unconfined		0.73
S-382	8/23/2019	16.44	17.40	0.96	3.62	unconfined		0.73
S-382	10/18/2019	17.35	18.04	0.69	2.78	unconfined		0.73
S-382	10/25/2019	17.35	17.63	0.28	2.89	unconfined		0.73
S-382	11/1/2019	17.51	17.53	0.02	2.80	unconfined		0.73
S-382	1/24/2020	17.51	17.68	0.17	2.76	unconfined		0.73
S-382	1/27/2020	17.19	18.52	1.33	2.77	unconfined		0.73
S-382	1/28/2020	17.20	18.53	1.33	2.76	unconfined		0.73
S-382	1/31/2020	17.27	18.44	1.17	2.73	unconfined		0.73
S-382	2/3/2020	17.16	18.25	1.09	2.86	unconfined		0.73
S-382	2/4/2020	17.15	18.25	1.10	2.87	unconfined		0.73
S-382	2/7/2020	17.05	18.21	1.16	2.95	unconfined		0.73
S-382	2/13/2020	17.28	18.03	0.75	2.83	unconfined		0.73
S-382	2/21/2020	17.49	18.12	0.63	2.66	unconfined		0.73

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-382	2/24/2020	17.43	18.11	0.68	2.70	unconfined		0.73
S-382	2/25/2020	17.44	18.10	0.66	2.70	unconfined		0.73
S-382	2/27/2020	17.48	18.13	0.65	2.66	unconfined		0.73
S-382	2/28/2020	17.36	18.31	0.95	2.70	unconfined		0.73
S-382	3/2/2020	17.30	18.29	0.99	2.75	unconfined		0.73
S-382	3/17/2020	17.61	18.29	0.68	2.52	unconfined		0.73
S-382	3/24/2020	17.65	18.20	0.55	2.52	unconfined		0.73
S-382	4/16/2020	16.74	17.85	1.11	3.28	unconfined		0.73
S-382	4/21/2020	16.93	17.91	0.98	3.12	unconfined		0.73
S-382	4/23/2020	16.79	17.80	1.01	3.25	unconfined		0.73
S-382	4/24/2020	17.04	17.99	0.95	3.02	unconfined		0.73
S-382	4/30/2020	16.79	18.39	1.60	3.09	unconfined		0.73
S-382	5/21/2020	17.55	17.68	0.13	2.73	unconfined		0.73
S-382	5/22/2020	17.56	17.69	0.13	2.72	unconfined		0.73
S-382	5/26/2020	17.43	17.59	0.16	2.84	unconfined		0.73
S-382	5/27/2020	17.41	17.59	0.18	2.86	unconfined		0.73
S-382	5/28/2020	17.46	17.55	0.09	2.83	unconfined		0.73
S-382	5/29/2020	17.41	17.60	0.19	2.86	unconfined		0.73
S-382	6/5/2020	17.33	18.25	0.92	2.74	unconfined		0.73
S-382	6/11/2020	17.25	17.45	0.20	3.01	unconfined		0.73
S-382	6/12/2020	17.23	17.44	0.21	3.03	unconfined		0.73
S-382	6/15/2020	17.23	17.44	0.21	3.03	unconfined		0.73
S-382	6/29/2020	17.42	17.54	0.12	2.87	unconfined		0.73
S-382	7/1/2020	17.40	17.55	0.15	2.88	unconfined		0.73
S-382	7/6/2020	17.50	17.78	0.28	2.74	unconfined		0.73
S-382	7/7/2020	17.48	17.72	0.24	2.77	unconfined		0.73
S-382	7/9/2020	17.54	17.63	0.09	2.75	unconfined		0.73
S-382	7/10/2020	17.00	17.70	0.70	3.13	unconfined		0.73
S-382	7/13/2020	17.00	17.70	0.70	3.13	unconfined		0.73
S-382	7/16/2020	17.10	17.19	0.09	3.19	unconfined		0.73
S-382	7/21/2020	17.00	17.35	0.35	3.22	unconfined		0.73
S-382	7/22/2020	17.31	17.62	0.31	2.92	unconfined		0.73
S-382	7/23/2020	17.31	17.60	0.29	2.93	unconfined		0.73
S-382	7/24/2020	17.27	17.59	0.32	2.96	unconfined		0.73
S-382	7/27/2020	17.34	17.52	0.18	2.93	unconfined		0.73
S-382	7/28/2020	17.35	17.50	0.15	2.93	unconfined		0.73
S-382	7/30/2020	17.30	17.48	0.18	2.97	unconfined		0.73
S-382	7/31/2020	17.55	17.62	0.07	2.75	unconfined		0.73
S-382	8/3/2020	17.61	17.69	0.08	2.69	unconfined		0.73
S-382	8/4/2020	17.60	17.71	0.11	2.69	unconfined		0.73
S-382	8/6/2020	16.91	16.98	0.07	3.39	unconfined		0.73
S-382	8/10/2020	16.54	17.61	1.07	3.49	unconfined		0.73
S-382	8/13/2020	16.62	17.12	0.50	3.56	unconfined		0.73
S-382	8/17/2020	16.48	17.88	1.40	3.46	unconfined		0.73
S-382	8/18/2020	16.48	17.88	1.40	3.46	unconfined		0.73
S-382	8/20/2020	16.55	17.93	1.38	3.39	unconfined		0.73
S-382	8/24/2020	17.06	17.11	0.05	3.24	unconfined		0.73
S-382	8/27/2020	16.80	17.30	0.50	3.38	unconfined		0.73
S-382	8/31/2020	16.84	18.25	1.41	3.09	unconfined		0.73
S-382	9/1/2020	16.20	16.85	0.65	3.94	unconfined		0.73
S-382	9/3/2020	17.18	17.38	0.20	3.08	unconfined		0.73
S-382	9/8/2020	17.05	17.80	0.75	3.06	unconfined		0.73
S-382	9/9/2020	16.95	17.10	0.15	3.33	unconfined		0.73
S-382	9/10/2020	17.05	18.25	1.20	2.94	unconfined		0.73
S-382	9/14/2020	16.90	18.20	1.30	3.06	unconfined		0.73
S-382	9/18/2020	17.10	17.85	0.75	3.01	unconfined		0.73
S-382	11/2/2020	16.90	17.90	1.00	3.15	unconfined		0.73
S-382	2/12/2021	16.95	17.10	0.15	3.33	unconfined		0.73
S-382	2/17/2021	16.90	16.90	0.00	3.42	unconfined		0.73
S-382	3/23/2021	17.58	18.03	0.45	2.62	unconfined		0.73
S-382	3/23/2021	17.58	18.03	0.45	2.62	unconfined		0.73
S-382	3/24/2021	16.65	17.35	0.70	3.48	unconfined		0.73
S-382	4/1/2021	16.23	17.00	0.77	3.88	unconfined		0.73
S-382	4/7/2021	16.29	17.09	0.80	3.81	unconfined		0.73
S-382	7/6/2021	16.50	16.76	0.26	3.75	unconfined		0.73
S-382	7/9/2021	17.15	17.16	0.01	3.17	unconfined		0.73
S-382	7/23/2021	16.30	16.96	0.66	3.84	unconfined		0.73

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-382	7/30/2021	16.32	17.13	0.81	3.78	unconfined		0.73
S-382	8/3/2021	16.50	17.50	1.00	3.55	unconfined		0.73
S-382	8/10/2021	16.55	17.55	1.00	3.50	unconfined		0.73
S-382	8/13/2021	16.51	17.42	0.91	3.56	unconfined		0.73
S-382	8/20/2021	16.63	17.60	0.97	3.42	unconfined		0.73
S-382	8/24/2021	16.43	17.15	0.72	3.69	unconfined		0.73
S-382	8/27/2021	16.50	17.22	0.72	3.62	unconfined		0.73
S-382	9/3/2021	15.77	16.31	0.54	4.40	unconfined		0.73
S-382	9/10/2021	16.07	16.60	0.53	4.10	unconfined		0.73
S-382	9/16/2021	16.29	16.98	0.69	3.84	unconfined		0.73
S-382	9/22/2021	16.25	16.99	0.74	3.87	unconfined		0.73
S-382	9/24/2021	16.09	16.66	0.57	4.07	unconfined		0.73
S-382	9/29/2021	16.22	16.86	0.64	3.92	unconfined		0.73
S-382	10/5/2021	16.32	17.09	0.77	3.79	unconfined		0.73
S-382	10/14/2021	16.20	16.88	0.68	3.93	unconfined		0.73
S-382	10/21/2021	16.42	17.34	0.92	3.65	unconfined		0.73
S-382	10/28/2021	16.26	16.93	0.67	3.88	unconfined		0.73
S-382	11/4/2021	16.31	16.93	0.62	3.84	unconfined		0.73
S-382	11/11/2021	16.40	17.30	0.90	3.67	unconfined		0.73
S-382	11/18/2021	16.54	17.48	0.94	3.52	unconfined		0.73
S-382	11/24/2021	16.73	17.64	0.91	3.34	unconfined		0.73
S-382	12/22/2021	17.08	17.86	0.78	3.03	unconfined		0.73
S-382	12/30/2021	17.09	17.84	0.75	3.02	unconfined		0.73
S-382	1/4/2022	17.06	17.64	0.58	3.10	unconfined		0.73
S-382	1/12/2022	17.25	18.20	0.95	2.81	unconfined		0.73
S-382	1/25/2022	17.28	18.12	0.84	2.81	unconfined		0.73
S-382	2/8/2022	17.41	18.26	0.85	2.68	unconfined		0.73
S-382	2/11/2022	17.45	18.33	0.88	2.63	unconfined		0.73
S-382	2/14/2022	17.59	18.56	0.97	2.46	unconfined		0.73
S-382	2/24/2022	17.53	18.57	1.04	2.51	unconfined		0.73
S-382	2/28/2022	17.59	18.47	0.88	2.49	unconfined		0.73
S-382	3/17/2022	17.72	18.85	1.13	2.29	unconfined		0.73
S-382	3/31/2022	17.52	18.45	0.93	2.55	unconfined		0.73
S-382	4/8/2022	17.50	18.43	0.93	2.57	unconfined		0.73
S-382	4/12/2022	16.98	17.44	0.46	3.21	unconfined		0.73
S-382	4/20/2022	16.94	17.63	0.69	3.19	unconfined		0.73
S-382	4/25/2022	16.90	17.65	0.75	3.21	unconfined		0.73
S-382	5/2/2022	16.99	17.94	0.95	3.07	unconfined		0.73
S-382	5/9/2022	16.85	17.54	0.69	3.28	unconfined		0.73
S-382	5/26/2022	16.87	17.00	0.13	3.41	unconfined		0.73
S-382	6/15/2022	16.71	17.05	0.34	3.52	unconfined		0.73
S-382	7/14/2022	16.93	17.76	0.83	3.16	unconfined		0.73
S-382	7/18/2022	17.07	17.78	0.71	3.06	unconfined		0.73
S-382	7/26/2022	17.20	18.04	0.84	2.89	unconfined		0.73
S-382	8/1/2022	17.21	18.21	1.00	2.84	unconfined		0.73
S-382	8/9/2022	17.42	18.42	1.00	2.63	unconfined		0.73
S-382	8/24/2022	17.26	17.93	0.67	2.88	unconfined		0.73
S-382	8/29/2022	17.30	18.11	0.81	2.80	unconfined		0.73
S-382	9/8/2022	17.32	18.23	0.91	2.75	unconfined		0.73
S-382	9/22/2022	17.34	18.11	0.77	2.77	unconfined		0.73
S-382	9/28/2022	17.54	18.35	0.81	2.56	unconfined		0.73
S-382	10/5/2022	17.09	17.18	0.09	3.20	unconfined		0.73
S-382	10/13/2022	17.37	17.39	0.02	2.94	unconfined		0.73
S-382	10/20/2022	17.33	17.74	0.41	2.88	unconfined		0.73
S-382	11/1/2022	17.40	17.92	0.52	2.78	unconfined		0.73
S-382	11/10/2022	17.58	18.33	0.75	2.53	unconfined		0.73
S-382	11/16/2022	17.54	18.27	0.73	2.58	unconfined		0.73
S-382	3/23/2023	17.49	17.65	0.16	2.78	unconfined		0.73
S-382	3/29/2023	17.42	17.78	0.36	2.80	unconfined		0.73
S-382	4/5/2023	17.48	18.08	0.60	2.67	unconfined		0.73
S-382	4/13/2023	17.49	18.15	0.66	2.65	unconfined		0.73
S-382	4/19/2023	17.53	18.19	0.66	2.61	unconfined		0.73
S-382	4/26/2023	17.53	18.20	0.67	2.61	unconfined		0.73
S-382	5/3/2023	16.79	17.13	0.34	3.44	unconfined		0.73
S-382	5/10/2023	17.03	17.28	0.25	3.22	unconfined		0.73
S-382	5/16/2023	17.29	17.43	0.14	2.99	unconfined		0.73
S-382	5/23/2023	17.45	17.58	0.13	2.83	unconfined		0.73

Table 3-2
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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-382	5/31/2023	17.54	17.78	0.24	2.71	unconfined		0.73
S-382	6/7/2023	17.46	17.83	0.37	2.76	unconfined		0.73
S-382	6/20/2023	17.51	18.13	0.62	2.64	unconfined		0.73
S-382	6/27/2023	17.35	17.78	0.43	2.85	unconfined		0.73
S-382	7/19/2023	16.51	16.82	0.31	3.72	unconfined		0.73
S-382	7/26/2023	16.40	16.65	0.25	3.85	unconfined		0.73
S-382	8/2/2023	16.62	16.87	0.25	3.63	unconfined		0.73
S-382	8/9/2023	16.53	16.70	0.17	3.74	unconfined		0.73
S-382	9/5/2023	17.05	17.07	0.02	3.26	unconfined		0.73
S-382	9/15/2023	--	17.02	--	3.30	unconfined		0.73
S-382	9/20/2023	--	16.95	--	3.37	unconfined		0.73
S-382	9/27/2023	--	16.40	--	3.92	unconfined		0.73
S-382	10/4/2023	--	16.46	--	3.86	unconfined		0.73
S-382	10/17/2023	--	16.72	--	3.60	unconfined		0.73
S-382	10/26/2023	--	17.10	--	3.22	unconfined		0.73
S-382	11/1/2023	--	17.08	--	3.24	unconfined		0.73
S-382	11/9/2023	17.14	17.16	0.02	3.17	unconfined		0.73
S-382	11/13/2023	--	17.35	--	2.97	unconfined		0.73
S-382	11/22/2023	--	17.26	--	3.06	unconfined		0.73
S-382	11/29/2023	--	17.29	--	3.03	unconfined		0.73
S-382	12/14/2023	--	16.93	--	3.39	unconfined		0.73
S-382	12/20/2023	--	15.88	--	4.44	unconfined		0.73
S-382	1/3/2024	--	15.93	--	4.39	unconfined		0.73
S-382	1/11/2024	--	15.25	--	5.07	unconfined		0.73
S-382	1/18/2024	--	15.57	--	4.75	unconfined		0.73
S-382	1/24/2024	--	16.20	--	4.12	unconfined		0.73
S-382	1/30/2024	--	15.60	--	4.72	unconfined		0.73
S-382	2/5/2024	--	15.61	--	4.71	unconfined		0.73
S-382	2/15/2024	--	16.10	--	4.22	unconfined		0.73
S-382	2/21/2024	--	16.38	--	3.94	unconfined		0.73
S-382	2/28/2024	--	16.36	--	3.96	unconfined		0.73
S-382	3/5/2024	--	16.49	--	3.83	unconfined		0.73
S-382	3/20/2024	--	16.08	--	4.24	unconfined		0.73
S-382	3/28/2024	--	15.50	--	4.82	unconfined		0.73
S-382	4/3/2024	--	15.51	--	4.81	unconfined		0.73
S-382	4/9/2024	--	15.04	--	5.28	unconfined		0.73
S-382	4/25/2024	--	15.77	--	4.55	unconfined		0.73
S-382	4/30/2024	--	15.83	--	4.49	unconfined		0.73
S-382	5/8/2024	--	16.04	--	4.28	unconfined		0.73
S-382	5/20/2024	--	16.25	--	4.07	unconfined		0.73
S-382	5/31/2024	--	16.53	--	3.79	unconfined		0.73
S-382	6/5/2024	--	16.64	--	3.68	unconfined		0.73
S-382	6/12/2024	--	16.53	--	3.79	unconfined		0.73
S-382	6/19/2024	--	16.78	--	3.54	unconfined		0.73
S-382	6/26/2024	--	16.90	--	3.42	unconfined		0.73
S-382	7/2/2024	--	16.77	--	3.55	unconfined		0.73
S-382	7/10/2024	--	16.53	--	3.79	unconfined		0.73
S-382	7/16/2024	--	16.64	--	3.68	unconfined		0.73
S-382	7/24/2024	--	16.75	--	3.57	unconfined		0.73
S-382	8/1/2024	--	17.02	--	3.30	unconfined		0.73
S-382	8/6/2024	--	16.97	--	3.35	unconfined		0.73
S-382	8/23/2024	--	16.23	--	4.09	unconfined		0.73
S-382	8/28/2024	--	16.44	--	3.88	unconfined		0.73
S-382	9/4/2024	--	16.68	--	3.64	unconfined		0.73
S-382	9/11/2024	--	16.81	--	3.51	unconfined		0.73
S-382	9/18/2024	--	16.95	--	3.37	unconfined		0.73
S-382	9/25/2024	--	16.84	--	3.48	unconfined		0.73
S-382	10/1/2024	--	16.99	--	3.33	unconfined		0.73
S-382	10/14/2024	--	17.34	--	2.98	unconfined		0.73
S-382	10/28/2024	--	17.70	--	2.62	unconfined		0.73
S-382	11/8/2024	--	17.87	--	2.45	unconfined		0.73
S-382	11/15/2024	--	17.90	--	2.42	unconfined		0.73
S-382	11/20/2024	--	17.85	--	2.47	unconfined		0.73
S-382	11/26/2024	--	17.94	--	2.38	unconfined		0.73
S-382	12/4/2024	--	18.05	--	2.27	unconfined		0.73
S-382	12/11/2024	--	18.03	--	2.29	unconfined		0.73
S-382	12/17/2024	--	17.83	--	2.49	unconfined		0.73

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-382	1/8/2025	--	17.77	--	2.55	unconfined		0.73
S-382	1/16/2025	--	18.06	--	2.26	unconfined		0.73
S-382	1/24/2025	--	18.11	--	2.21	unconfined		0.73
S-382	1/29/2025	--	18.22	--	2.10	unconfined		0.73
S-382	2/5/2025	--	18.22	--	2.10	unconfined		0.73
S-382	2/12/2025	--	18.25	--	2.07	unconfined		0.73
S-382	2/20/2025	--	18.12	--	2.20	unconfined		0.73
S-411	6/19/2018	--	22.21	--	2.84	unconfined		--
S-411	6/28/2018	--	25.49	--	-0.44	unconfined		--
S-411	2/27/2019	--	22.49	--	0.85	unconfined		--
S-411	6/5/2019	--	25.26	--	1.41	unconfined		--
S-411	10/29/2019	--	26.70	--	-0.03	unconfined		--
S-411	4/17/2020	--	24.86	--	1.81	unconfined		--
S-411	6/5/2020	--	25.10	--	1.57	unconfined		--
S-411	4/15/2021	--	25.19	--	1.48	unconfined		--
S-411	4/27/2021	--	25.68	--	0.99	unconfined		--
S-411	10/26/2021	--	25.43	--	1.24	unconfined		--
S-411	3/24/2022	--	26.26	--	0.41	unconfined		--
S-411	4/13/2023	--	26.20	--	0.47	unconfined		--
S-411	4/26/2023	--	26.23	--	0.44	unconfined		--
S-411	4/11/2024	--	23.62	--	3.05	unconfined		--
S-411	4/26/2024	--	24.29	--	2.38	unconfined		--
S-414	6/19/2018	19.75	23.40	3.65	1.79	unconfined		0.73
S-414	7/26/2018	21.18	23.97	2.79	0.59	unconfined		0.73
S-414	7/26/2018	21.21	24.00	2.79	0.56	unconfined		0.73
S-414	7/30/2018	21.21	23.94	2.73	0.58	unconfined		0.73
S-414	8/1/2018	21.20	23.93	2.73	0.59	unconfined		0.73
S-414	8/2/2018	21.21	23.96	2.75	0.57	unconfined		0.73
S-414	8/16/2018	21.20	23.84	2.64	0.61	unconfined		0.73
S-414	8/29/2018	21.28	23.97	2.69	0.52	unconfined		0.73
S-414	9/5/2018	22.25	24.67	2.42	-0.38	unconfined		0.73
S-414	9/6/2018	22.33	25.34	3.01	-0.62	unconfined		0.73
S-414	9/7/2018	22.22	24.36	2.14	-0.27	unconfined		0.73
S-414	9/10/2018	21.76	24.31	2.55	0.08	unconfined		0.73
S-414	9/13/2018	20.74	22.80	2.06	1.23	unconfined		0.73
S-414	9/17/2018	20.83	22.85	2.02	1.15	unconfined		0.73
S-414	9/18/2018	20.64	23.04	2.40	1.24	unconfined		0.73
S-414	9/20/2018	21.05	23.07	2.02	0.93	unconfined		0.73
S-414	9/21/2018	21.62	23.51	1.89	0.40	unconfined		0.73
S-414	9/21/2018	21.62	23.51	1.89	0.40	unconfined		0.73
S-414	9/24/2018	21.03	23.35	2.32	0.87	unconfined		0.73
S-414	9/25/2018	21.57	23.35	1.78	0.48	unconfined		0.73
S-414	9/25/2018	21.57	23.35	1.78	0.48	unconfined		0.73
S-414	9/26/2018	21.54	23.34	1.80	0.50	unconfined		0.73
S-414	9/26/2018	21.54	23.34	1.80	0.50	unconfined		0.73
S-414	9/27/2018	21.63	23.37	1.74	0.43	unconfined		0.73
S-414	9/27/2018	21.63	23.37	1.74	0.43	unconfined		0.73
S-414	9/28/2018	21.61	23.39	1.78	0.44	unconfined		0.73
S-414	10/1/2018	21.41	23.34	1.93	0.60	unconfined		0.73
S-414	10/2/2018	21.65	23.79	2.14	0.30	unconfined		0.73
S-414	10/3/2018	21.60	23.69	2.09	0.36	unconfined		0.73
S-414	10/4/2018	20.93	23.05	2.12	1.03	unconfined		0.73
S-414	10/5/2018	21.52	23.36	1.84	0.51	unconfined		0.73
S-414	10/8/2018	21.48	23.38	1.90	0.53	unconfined		0.73
S-414	10/9/2018	21.73	24.14	2.41	0.15	unconfined		0.73
S-414	10/12/2018	21.55	23.89	2.34	0.35	unconfined		0.73
S-414	10/15/2018	21.59	23.51	1.92	0.42	unconfined		0.73
S-414	10/16/2018	21.67	23.55	1.88	0.35	unconfined		0.73
S-414	10/17/2018	21.46	23.41	1.95	0.54	unconfined		0.73
S-414	10/18/2018	21.77	23.43	1.66	0.31	unconfined		0.73
S-414	10/19/2018	21.94	23.90	1.96	0.06	unconfined		0.73
S-414	10/22/2018	22.03	23.75	1.72	0.03	unconfined		0.73
S-414	10/23/2018	22.06	23.82	1.76	-0.01	unconfined		0.73
S-414	10/26/2018	22.12	24.68	2.56	-0.28	unconfined		0.73
S-414	10/29/2018	21.96	23.76	1.80	0.08	unconfined		0.73
S-414	11/5/2018	21.89	23.44	1.55	0.22	unconfined		0.73
S-414	11/6/2018	21.80	23.41	1.61	0.29	unconfined		0.73

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-414	11/7/2018	21.63	23.37	1.74	0.43	unconfined		0.73
S-414	11/12/2018	21.55	23.32	1.77	0.50	unconfined		0.73
S-414	11/13/2018	21.67	23.14	1.47	0.46	unconfined		0.73
S-414	11/13/2018	21.67	23.14	1.47	0.46	unconfined		0.73
S-414	11/14/2018	20.97	23.12	2.15	0.98	unconfined		0.73
S-414	11/16/2018	21.30	23.00	1.70	0.77	unconfined		0.73
S-414	11/20/2018	21.35	23.31	1.96	0.65	unconfined		0.73
S-414	12/3/2018	21.00	23.18	2.18	0.94	unconfined		0.73
S-414	12/6/2018	21.10	23.28	2.18	0.84	unconfined		0.73
S-414	12/11/2018	21.10	23.29	2.19	0.84	unconfined		0.73
S-414	12/12/2018	21.30	23.06	1.76	0.75	unconfined		0.73
S-414	12/17/2018	21.29	23.42	2.13	0.66	unconfined		0.73
S-414	12/20/2018	20.79	22.89	2.10	1.17	unconfined		0.73
S-414	12/27/2018	20.72	22.75	2.03	1.26	unconfined		0.73
S-414	12/28/2018	20.60	22.64	2.04	1.38	unconfined		0.73
S-414	1/2/2019	20.47	22.32	1.85	1.56	unconfined		0.73
S-414	1/2/2019	20.47	22.32	1.85	1.56	unconfined		0.73
S-414	1/3/2019	20.40	22.25	1.85	1.63	unconfined		0.73
S-414	1/4/2019	20.37	22.25	1.88	1.65	unconfined		0.73
S-414	1/14/2019	20.71	22.82	2.11	1.25	unconfined		0.73
S-414	1/15/2019	20.67	22.77	2.10	1.29	unconfined		0.73
S-414	1/23/2019	21.02	23.24	2.22	0.91	unconfined		0.73
S-414	1/30/2019	20.65	22.58	1.93	1.36	unconfined		0.73
S-414	2/1/2019	20.95	23.04	2.09	1.01	unconfined		0.73
S-414	2/6/2019	20.99	23.09	2.10	0.97	unconfined		0.73
S-414	2/11/2019	21.21	23.25	2.04	0.77	unconfined		0.73
S-414	2/13/2019	21.09	22.79	1.70	0.98	unconfined		0.73
S-414	2/15/2019	20.90	22.84	1.94	1.10	unconfined		0.73
S-414	2/18/2019	20.88	22.72	1.84	1.15	unconfined		0.73
S-414	2/22/2019	20.95	22.87	1.92	1.06	unconfined		0.73
S-414	2/25/2019	20.86	22.67	1.81	1.18	unconfined		0.73
S-414	3/1/2019	20.95	22.92	1.97	1.05	unconfined		0.73
S-414	3/4/2019	20.82	22.64	1.82	1.22	unconfined		0.73
S-414	3/12/2019	20.81	22.62	1.81	1.23	unconfined		0.73
S-414	3/13/2019	20.68	22.68	2.00	1.31	unconfined		0.73
S-414	3/18/2019	20.92	22.85	1.93	1.09	unconfined		0.73
S-414	3/21/2019	20.89	22.67	1.78	1.16	unconfined		0.73
S-414	3/22/2019	20.89	22.67	1.78	1.16	unconfined		0.73
S-414	3/25/2019	21.02	22.99	1.97	0.98	unconfined		0.73
S-414	3/29/2019	20.99	22.91	1.92	1.02	unconfined		0.73
S-414	4/2/2019	21.19	23.19	2.00	0.80	unconfined		0.73
S-414	4/5/2019	21.22	23.24	2.02	0.76	unconfined		0.73
S-414	4/8/2019	21.14	23.19	2.05	0.83	unconfined		0.73
S-414	4/12/2019	21.15	23.10	1.95	0.85	unconfined		0.73
S-414	4/15/2019	21.16	22.91	1.75	0.90	unconfined		0.73
S-414	4/19/2019	21.13	23.07	1.94	0.87	unconfined		0.73
S-414	4/24/2019	21.07	22.90	1.83	0.96	unconfined		0.73
S-414	4/26/2019	21.01	22.83	1.82	1.03	unconfined		0.73
S-414	4/29/2019	21.18	23.09	1.91	0.83	unconfined		0.73
S-414	5/3/2019	21.33	22.77	1.44	0.81	unconfined		0.73
S-414	5/10/2019	21.10	22.94	1.84	0.93	unconfined		0.73
S-414	5/15/2019	20.81	22.44	1.63	1.28	unconfined		0.73
S-414	5/17/2019	20.71	22.31	1.60	1.39	unconfined		0.73
S-414	5/22/2019	20.90	22.71	1.81	1.14	unconfined		0.73
S-414	5/24/2019	20.92	22.72	1.80	1.12	unconfined		0.73
S-414	5/28/2019	20.97	22.81	1.84	1.06	unconfined		0.73
S-414	5/31/2019	20.98	22.90	1.92	1.03	unconfined		0.73
S-414	6/10/2019	21.13	23.04	1.91	0.88	unconfined		0.73
S-414	6/14/2019	21.13	22.98	1.85	0.90	unconfined		0.73
S-414	6/17/2019	21.14	22.98	1.84	0.89	unconfined		0.73
S-414	6/26/2019	20.61	22.21	1.60	1.49	unconfined		0.73
S-414	6/28/2019	20.70	22.49	1.79	1.34	unconfined		0.73
S-414	7/1/2019	20.80	22.55	1.75	1.26	unconfined		0.73
S-414	7/3/2019	20.85	22.62	1.77	1.20	unconfined		0.73
S-414	7/8/2019	20.74	22.35	1.61	1.35	unconfined		0.73
S-414	7/15/2019	20.65	22.25	1.60	1.45	unconfined		0.73
S-414	7/22/2019	20.83	22.57	1.74	1.23	unconfined		0.73

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Bellwether District Holdings, LLC, Philadelphia, PA

Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-414	7/29/2019	20.88	22.64	1.76	1.17	unconfined		0.73
S-414	8/2/2019	20.96	22.76	1.80	1.08	unconfined		0.73
S-414	8/12/2019	20.92	22.72	1.80	1.12	unconfined		0.73
S-414	8/16/2019	21.00	22.81	1.81	1.04	unconfined		0.73
S-414	8/19/2019	21.12	22.83	1.71	0.95	unconfined		0.73
S-414	8/23/2019	21.12	22.98	1.86	0.91	unconfined		0.73
S-414	9/6/2019	21.27	23.13	1.86	0.76	unconfined		0.73
S-414	10/18/2019	21.87	23.80	1.93	0.14	unconfined		0.73
S-414	11/14/2019	22.01	23.91	1.90	0.00	unconfined		0.73
S-414	11/22/2019	21.47	23.81	2.34	0.43	unconfined		0.73
S-414	12/10/2019	20.40	20.99	0.59	1.97	unconfined		0.73
S-414	12/16/2019	22.39	23.01	0.62	-0.03	unconfined		0.73
S-414	12/30/2019	22.05	22.54	0.49	0.35	unconfined		0.73
S-414	1/2/2020	22.01	22.69	0.68	0.34	unconfined		0.73
S-414	1/10/2020	21.60	22.74	1.14	0.62	unconfined		0.73
S-414	1/13/2020	22.45	22.91	0.46	-0.04	unconfined		0.73
S-414	1/22/2020	22.31	23.41	1.10	-0.08	unconfined		0.73
S-414	1/23/2020	22.39	23.09	0.70	-0.05	unconfined		0.73
S-414	1/28/2020	22.06	22.67	0.61	0.30	unconfined		0.73
S-414	1/31/2020	22.01	22.97	0.96	0.26	unconfined		0.73
S-414	2/4/2020	21.89	22.97	1.08	0.35	unconfined		0.73
S-414	2/13/2020	21.89	22.81	0.92	0.39	unconfined		0.73
S-414	2/21/2020	22.40	23.22	0.82	-0.09	unconfined		0.73
S-414	2/25/2020	21.99	23.25	1.26	0.20	unconfined		0.73
S-414	2/27/2020	21.89	23.25	1.36	0.27	unconfined		0.73
S-414	3/19/2020	22.09	23.61	1.52	0.03	unconfined		0.73
S-414	3/24/2020	22.04	23.30	1.26	0.15	unconfined		0.73
S-414	3/26/2020	21.88	23.29	1.41	0.27	unconfined		0.73
S-414	4/2/2020	21.56	22.64	1.08	0.68	unconfined		0.73
S-414	4/16/2020	21.69	22.99	1.30	0.49	unconfined		0.73
S-414	4/17/2020	21.67	23.05	1.38	0.49	unconfined		0.73
S-414	4/21/2020	21.55	22.96	1.41	0.60	unconfined		0.73
S-414	4/23/2020	21.80	23.28	1.48	0.33	unconfined		0.73
S-414	4/24/2020	21.65	23.13	1.48	0.48	unconfined		0.73
S-414	4/30/2020	21.55	23.08	1.53	0.57	unconfined		0.73
S-414	5/1/2020	21.46	22.81	1.35	0.70	unconfined		0.73
S-414	5/14/2020	21.82	22.13	0.31	0.63	unconfined		0.73
S-414	5/21/2020	21.92	23.51	1.59	0.18	unconfined		0.73
S-414	5/26/2020	21.85	23.33	1.48	0.28	unconfined		0.73
S-414	5/28/2020	21.84	23.29	1.45	0.30	unconfined		0.73
S-414	6/1/2020	21.90	22.42	0.52	0.49	unconfined		0.73
S-414	6/5/2020	21.80	23.30	1.50	0.32	unconfined		0.73
S-414	6/8/2020	21.82	22.48	0.66	0.53	unconfined		0.73
S-414	6/11/2020	21.73	23.04	1.31	0.44	unconfined		0.73
S-414	6/22/2020	21.88	23.37	1.49	0.25	unconfined		0.73
S-414	6/26/2020	21.81	23.30	1.49	0.32	unconfined		0.73
S-414	7/1/2020	21.85	23.34	1.49	0.28	unconfined		0.73
S-414	7/7/2020	21.92	23.41	1.49	0.21	unconfined		0.73
S-414	7/9/2020	21.95	23.26	1.31	0.22	unconfined		0.73
S-414	7/14/2020	21.66	23.88	2.22	0.27	unconfined		0.73
S-414	7/17/2020	21.86	22.94	1.08	0.38	unconfined		0.73
S-414	7/22/2020	21.71	23.15	1.44	0.43	unconfined		0.73
S-414	7/24/2020	21.81	22.91	1.10	0.42	unconfined		0.73
S-414	7/28/2020	21.82	23.30	1.48	0.31	unconfined		0.73
S-414	7/30/2020	21.91	22.95	1.04	0.34	unconfined		0.73
S-414	8/4/2020	20.92	21.19	0.27	1.54	unconfined		0.73
S-414	8/6/2020	21.69	22.78	1.09	0.54	unconfined		0.73
S-414	8/13/2020	21.36	22.88	1.52	0.76	unconfined		0.73
S-414	8/17/2020	21.35	22.62	1.27	0.84	unconfined		0.73
S-414	8/18/2020	21.35	22.62	1.27	0.84	unconfined		0.73
S-414	8/20/2020	21.43	23.73	2.30	0.48	unconfined		0.73
S-414	8/25/2020	21.49	22.89	1.40	0.66	unconfined		0.73
S-414	8/27/2020	21.51	22.98	1.47	0.62	unconfined		0.73
S-414	9/1/2020	21.66	23.11	1.45	0.48	unconfined		0.73
S-414	9/3/2020	21.61	22.98	1.37	0.55	unconfined		0.73
S-414	9/11/2020	21.90	22.76	0.86	0.40	unconfined		0.73
S-414	9/16/2020	21.75	23.21	1.46	0.38	unconfined		0.73

Table 3-2
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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-414	9/18/2020	21.75	23.07	1.32	0.42	unconfined		0.73
S-414	9/22/2020	21.80	21.81	0.01	0.73	unconfined		0.73
S-414	9/24/2020	21.75	23.15	1.40	0.40	unconfined		0.73
S-414	10/1/2020	21.81	22.30	0.49	0.59	unconfined		0.73
S-414	10/8/2020	21.78	23.18	1.40	0.37	unconfined		0.73
S-414	10/9/2020	21.95	23.41	1.46	0.18	unconfined		0.73
S-414	10/19/2020	21.90	23.28	1.38	0.26	unconfined		0.73
S-414	10/23/2020	21.93	23.30	1.37	0.23	unconfined		0.73
S-414	10/27/2020	21.96	23.35	1.39	0.19	unconfined		0.73
S-414	11/2/2020	21.79	23.03	1.24	0.40	unconfined		0.73
S-414	11/9/2020	21.62	23.26	1.64	0.47	unconfined		0.73
S-414	11/10/2020	21.64	23.24	1.60	0.46	unconfined		0.73
S-414	11/16/2020	21.95	22.58	0.63	0.41	unconfined		0.73
S-414	11/19/2020	21.90	22.56	0.66	0.45	unconfined		0.73
S-414	11/23/2020	21.19	21.92	0.73	1.14	unconfined		0.73
S-414	11/30/2020	21.21	21.96	0.75	1.12	unconfined		0.73
S-414	12/8/2020	21.75	22.62	0.87	0.54	unconfined		0.73
S-414	12/11/2020	21.80	22.43	0.63	0.56	unconfined		0.73
S-414	12/14/2020	21.65	22.44	0.79	0.67	unconfined		0.73
S-414	12/18/2020	21.69	22.64	0.95	0.58	unconfined		0.73
S-414	12/21/2020	21.49	22.51	1.02	0.76	unconfined		0.73
S-414	12/28/2020	21.12	22.17	1.05	1.13	unconfined		0.73
S-414	12/31/2020	21.27	22.41	1.14	0.95	unconfined		0.73
S-414	1/4/2021	21.09	22.23	1.14	1.13	unconfined		0.73
S-414	1/8/2021	21.03	22.16	1.13	1.19	unconfined		0.73
S-414	1/15/2021	21.19	22.39	1.20	1.01	unconfined		0.73
S-414	1/25/2021	21.98	22.90	0.92	0.30	unconfined		0.73
S-414	1/29/2021	21.70	23.14	1.44	0.44	unconfined		0.73
S-414	2/9/2021	21.60	22.94	1.34	0.57	unconfined		0.73
S-414	2/19/2021	21.51	22.60	1.09	0.72	unconfined		0.73
S-414	2/23/2021	21.44	22.61	1.17	0.77	unconfined		0.73
S-414	2/26/2021	21.48	22.63	1.15	0.74	unconfined		0.73
S-414	3/1/2021	21.26	22.39	1.13	0.96	unconfined		0.73
S-414	3/15/2021	21.51	22.79	1.28	0.67	unconfined		0.73
S-414	3/19/2021	21.92	21.94	0.02	0.60	unconfined		0.73
S-414	3/25/2021	21.44	22.15	0.71	0.90	unconfined		0.73
S-414	4/7/2021	21.20	22.26	1.06	1.04	unconfined		0.73
S-414	4/9/2021	21.24	22.31	1.07	1.00	unconfined		0.73
S-414	4/11/2021	21.24	22.31	1.07	1.00	unconfined		0.73
S-414	4/12/2021	21.24	22.31	1.07	1.00	unconfined		0.73
S-414	4/23/2021	21.45	22.61	1.16	0.77	unconfined		0.73
S-414	5/3/2021	21.33	22.62	1.29	0.85	unconfined		0.73
S-414	5/6/2021	21.53	22.82	1.29	0.65	unconfined		0.73
S-414	5/11/2021	21.58	22.90	1.32	0.59	unconfined		0.73
S-414	5/14/2021	21.66	23.07	1.41	0.49	unconfined		0.73
S-414	5/20/2021	21.66	22.98	1.32	0.51	unconfined		0.73
S-414	5/25/2021	21.62	22.95	1.33	0.55	unconfined		0.73
S-414	6/3/2021	21.47	22.61	1.14	0.75	unconfined		0.73
S-414	6/4/2021	21.45	22.60	1.15	0.77	unconfined		0.73
S-414	6/14/2021	21.30	22.43	1.13	0.92	unconfined		0.73
S-414	6/18/2021	21.14	22.26	1.12	1.09	unconfined		0.73
S-414	6/22/2021	21.16	22.23	1.07	1.08	unconfined		0.73
S-414	6/23/2021	21.14	22.26	1.12	1.09	unconfined		0.73
S-414	6/24/2021	21.45	22.74	1.29	0.73	unconfined		0.73
S-414	6/29/2021	21.45	22.74	1.29	0.73	unconfined		0.73
S-414	7/1/2021	21.53	22.90	1.37	0.63	unconfined		0.73
S-414	7/6/2021	21.30	22.51	1.21	0.90	unconfined		0.73
S-414	7/9/2021	21.48	22.72	1.24	0.71	unconfined		0.73
S-414	7/13/2021	21.42	22.64	1.22	0.78	unconfined		0.73
S-414	7/20/2021	21.13	22.24	1.11	1.10	unconfined		0.73
S-414	7/23/2021	21.32	22.45	1.13	0.90	unconfined		0.73
S-414	7/27/2021	21.28	22.45	1.17	0.93	unconfined		0.73
S-414	7/30/2021	21.25	22.39	1.14	0.97	unconfined		0.73
S-414	8/3/2021	21.45	22.69	1.24	0.75	unconfined		0.73
S-414	8/10/2021	21.55	22.86	1.31	0.63	unconfined		0.73
S-414	8/13/2021	21.53	22.80	1.27	0.66	unconfined		0.73
S-414	8/20/2021	21.57	22.86	1.29	0.61	unconfined		0.73

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-414	8/24/2021	21.46	22.64	1.18	0.75	unconfined		0.73
S-414	8/27/2021	21.41	22.57	1.16	0.81	unconfined		0.73
S-414	9/3/2021	20.98	22.28	1.30	1.20	unconfined		0.73
S-414	9/10/2021	21.02	21.91	0.89	1.27	unconfined		0.73
S-414	9/15/2021	21.02	21.91	0.89	1.27	unconfined		0.73
S-414	9/16/2021	21.16	22.17	1.01	1.10	unconfined		0.73
S-414	9/22/2021	21.18	22.30	1.12	1.05	unconfined		0.73
S-414	9/24/2021	21.06	21.14	0.08	1.45	unconfined		0.73
S-414	9/29/2021	21.12	22.20	1.08	1.12	unconfined		0.73
S-414	10/5/2021	21.28	22.41	1.13	0.94	unconfined		0.73
S-414	10/14/2021	21.10	22.16	1.06	1.14	unconfined		0.73
S-414	10/21/2021	21.40	22.57	1.17	0.81	unconfined		0.73
S-414	10/28/2021	21.23	22.40	1.17	0.98	unconfined		0.73
S-414	11/4/2021	21.32	22.26	0.94	0.96	unconfined		0.73
S-414	11/11/2021	21.33	22.36	1.03	0.92	unconfined		0.73
S-414	11/18/2021	21.48	22.78	1.30	0.70	unconfined		0.73
S-414	11/24/2021	21.72	23.07	1.35	0.44	unconfined		0.73
S-414	12/22/2021	22.05	23.37	1.32	0.12	unconfined		0.73
S-414	12/30/2021	22.00	23.22	1.22	0.20	unconfined		0.73
S-414	1/4/2022	22.09	23.27	1.18	0.12	unconfined		0.73
S-414	1/12/2022	22.17	23.54	1.37	-0.01	unconfined		0.73
S-414	1/25/2022	22.15	23.32	1.17	0.06	unconfined		0.73
S-414	2/8/2022	22.25	22.51	0.26	0.21	unconfined		0.73
S-414	2/11/2022	22.29	23.39	1.10	-0.06	unconfined		0.73
S-414	2/14/2022	22.38	23.58	1.20	-0.18	unconfined		0.73
S-414	2/24/2022	22.40	23.45	1.05	-0.15	unconfined		0.73
S-414	2/28/2022	22.48	23.56	1.08	-0.24	unconfined		0.73
S-414	3/17/2022	22.81	23.03	0.22	-0.34	unconfined		0.73
S-414	3/24/2022	22.70	22.89	0.19	-0.22	unconfined		0.73
S-414	3/31/2022	22.55	22.73	0.18	-0.07	unconfined		0.73
S-414	4/8/2022	22.60	22.77	0.17	-0.12	unconfined		0.73
S-414	4/12/2022	21.90	22.29	0.39	0.52	unconfined		0.73
S-414	4/20/2022	21.90	22.44	0.54	0.48	unconfined		0.73
S-414	4/25/2022	21.85	22.38	0.53	0.54	unconfined		0.73
S-414	5/2/2022	22.00	22.66	0.66	0.35	unconfined		0.73
S-414	5/9/2022	21.76	22.22	0.46	0.65	unconfined		0.73
S-414	5/26/2022	21.72	22.44	0.72	0.61	unconfined		0.73
S-414	6/15/2022	21.54	22.14	0.60	0.83	unconfined		0.73
S-414	7/14/2022	21.89	22.88	0.99	0.37	unconfined		0.73
S-414	7/18/2022	21.80	22.78	0.98	0.46	unconfined		0.73
S-414	7/26/2022	21.97	23.31	1.34	0.20	unconfined		0.73
S-414	8/1/2022	22.03	23.17	1.14	0.19	unconfined		0.73
S-414	8/9/2022	22.16	23.29	1.13	0.06	unconfined		0.73
S-414	8/24/2022	22.27	22.98	0.71	0.07	unconfined		0.73
S-414	8/29/2022	22.36	23.03	0.67	-0.01	unconfined		0.73
S-414	9/8/2022	22.38	22.81	0.43	0.03	unconfined		0.73
S-414	9/22/2022	22.33	22.75	0.42	0.09	unconfined		0.73
S-414	9/28/2022	22.59	22.99	0.40	-0.17	unconfined		0.73
S-414	10/5/2022	22.10	22.39	0.29	0.35	unconfined		0.73
S-414	10/13/2022	22.18	22.50	0.32	0.26	unconfined		0.73
S-414	10/20/2022	22.26	22.54	0.28	0.19	unconfined		0.73
S-414	10/27/2022	22.35	22.42	0.07	0.16	unconfined		0.73
S-414	11/1/2022	22.36	22.54	0.18	0.12	unconfined		0.73
S-414	11/10/2022	22.58	22.72	0.14	-0.09	unconfined		0.73
S-414	11/16/2022	22.58	22.73	0.15	-0.09	unconfined		0.73
S-414	11/22/2022	22.74	22.82	0.08	-0.23	unconfined		0.73
S-414	11/30/2022	22.63	22.72	0.09	-0.12	unconfined		0.73
S-414	12/14/2022	--	21.30	--	1.23	unconfined		0.73
S-414	12/21/2022	--	21.02	--	1.51	unconfined		0.73
S-414	12/28/2022	--	20.98	--	1.55	unconfined		0.73
S-414	1/3/2023	--	20.95	--	1.58	unconfined		0.73
S-414	1/10/2023	--	20.89	--	1.64	unconfined		0.73
S-414	1/19/2023	--	20.90	--	1.63	unconfined		0.73
S-414	1/26/2023	--	21.19	--	1.34	unconfined		0.73
S-414	1/31/2023	--	21.52	--	1.01	unconfined		0.73
S-414	2/7/2023	--	22.09	--	0.44	unconfined		0.73
S-414	2/16/2023	--	22.09	--	0.44	unconfined		0.73

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-414	2/28/2023	--	22.05	--	0.48	unconfined		0.73
S-414	3/7/2023	--	22.05	--	0.48	unconfined		0.73
S-414	3/16/2023	--	22.26	--	0.27	unconfined		0.73
S-414	3/23/2023	--	22.33	--	0.20	unconfined		0.73
S-414	3/29/2023	--	22.35	--	0.18	unconfined		0.73
S-414	4/5/2023	--	22.48	--	0.05	unconfined		0.73
S-414	4/13/2023	--	22.48	--	0.05	unconfined		0.73
S-414	4/19/2023	--	22.50	--	0.03	unconfined		0.73
S-414	4/26/2023	--	22.50	--	0.03	unconfined		0.73
S-414	5/3/2023	--	21.80	--	0.73	unconfined		0.73
S-414	5/10/2023	--	21.97	--	0.56	unconfined		0.73
S-414	5/16/2023	--	22.16	--	0.37	unconfined		0.73
S-414	5/23/2023	--	22.30	--	0.23	unconfined		0.73
S-414	5/31/2023	--	22.38	--	0.15	unconfined		0.73
S-414	6/7/2023	--	22.36	--	0.17	unconfined		0.73
S-414	6/20/2023	--	22.50	--	0.03	unconfined		0.73
S-414	6/27/2023	--	22.35	--	0.18	unconfined		0.73
S-414	7/19/2023	--	21.49	--	1.04	unconfined		0.73
S-414	7/26/2023	--	21.30	--	1.23	unconfined		0.73
S-414	8/2/2023	--	21.50	--	1.03	unconfined		0.73
S-414	8/9/2023	--	21.40	--	1.13	unconfined		0.73
S-414	8/23/2023	--	21.64	--	0.89	unconfined		0.73
S-414	8/30/2023	--	21.65	--	0.88	unconfined		0.73
S-414	9/5/2023	--	21.83	--	0.70	unconfined		0.73
S-414	9/15/2023	--	21.87	--	0.66	unconfined		0.73
S-414	9/20/2023	--	21.81	--	0.72	unconfined		0.73
S-414	9/27/2023	--	21.28	--	1.25	unconfined		0.73
S-414	10/4/2023	--	21.25	--	1.28	unconfined		0.73
S-414	10/17/2023	--	21.51	--	1.02	unconfined		0.73
S-414	10/26/2023	--	21.85	--	0.68	unconfined		0.73
S-414	11/1/2023	--	21.85	--	0.68	unconfined		0.73
S-414	11/9/2023	--	21.91	--	0.62	unconfined		0.73
S-414	11/13/2023	--	22.11	--	0.42	unconfined		0.73
S-414	11/22/2023	--	22.05	--	0.48	unconfined		0.73
S-414	11/29/2023	--	22.11	--	0.42	unconfined		0.73
S-414	12/14/2023	--	21.75	--	0.78	unconfined		0.73
S-414	12/20/2023	--	20.82	--	1.71	unconfined		0.73
S-414	1/3/2024	--	20.69	--	1.84	unconfined		0.73
S-414	1/3/2024	--	20.69	--	1.84	unconfined		0.73
S-414	1/11/2024	--	20.25	--	2.28	unconfined		0.73
S-414	1/18/2024	--	20.34	--	2.19	unconfined		0.73
S-414	1/24/2024	--	20.90	--	1.63	unconfined		0.73
S-414	1/30/2024	--	20.46	--	2.07	unconfined		0.73
S-414	2/5/2024	--	20.44	--	2.09	unconfined		0.73
S-414	2/15/2024	--	20.97	--	1.56	unconfined		0.73
S-414	2/21/2024	--	21.21	--	1.32	unconfined		0.73
S-414	2/28/2024	--	21.18	--	1.35	unconfined		0.73
S-414	3/5/2024	--	21.25	--	1.28	unconfined		0.73
S-414	3/20/2024	--	20.86	--	1.67	unconfined		0.73
S-414	3/28/2024	--	20.43	--	2.10	unconfined		0.73
S-414	4/3/2024	--	20.40	--	2.13	unconfined		0.73
S-414	4/9/2024	--	19.93	--	2.60	unconfined		0.73
S-414	4/25/2024	--	20.59	--	1.94	unconfined		0.73
S-414	4/30/2024	--	20.63	--	1.90	unconfined		0.73
S-414	5/8/2024	--	20.84	--	1.69	unconfined		0.73
S-414	5/20/2024	--	21.05	--	1.48	unconfined		0.73
S-414	5/31/2024	--	21.35	--	1.18	unconfined		0.73
S-414	6/5/2024	--	21.45	--	1.08	unconfined		0.73
S-414	6/12/2024	--	21.39	--	1.14	unconfined		0.73
S-414	6/19/2024	--	21.60	--	0.93	unconfined		0.73
S-414	6/26/2024	--	21.65	--	0.88	unconfined		0.73
S-414	7/2/2024	--	21.59	--	0.94	unconfined		0.73
S-414	7/10/2024	--	21.28	--	1.25	unconfined		0.73
S-414	7/16/2024	--	21.41	--	1.12	unconfined		0.73
S-414	7/24/2024	--	21.60	--	0.93	unconfined		0.73
S-414	8/1/2024	--	21.83	--	0.70	unconfined		0.73
S-414	8/6/2024	--	21.86	--	0.67	unconfined		0.73

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-414	8/23/2024	--	21.04	--	1.49	unconfined		0.73
S-414	8/28/2024	--	21.18	--	1.35	unconfined		0.73
S-414	9/4/2024	--	21.47	--	1.06	unconfined		0.73
S-414	9/11/2024	--	21.64	--	0.89	unconfined		0.73
S-414	9/18/2024	--	--	--	--	unconfined	Unable to access	0.73
S-414	9/25/2024	--	--	--	--	unconfined	Unable to access	0.73
S-414	10/1/2024	--	--	--	--	unconfined	Unable to access	0.73
S-414	10/14/2024	--	--	--	--	unconfined	Unable to access	0.73
S-414	10/28/2024	--	22.49	--	0.04	unconfined		0.73
S-414	11/8/2024	--	22.71	--	-0.18	unconfined		0.73
S-414	11/15/2024	--	22.71	--	-0.18	unconfined		0.73
S-414	11/20/2024	--	22.70	--	-0.17	unconfined		0.73
S-414	11/26/2024	--	22.71	--	-0.18	unconfined		0.73
S-414	12/4/2024	--	22.85	--	-0.32	unconfined		0.73
S-414	12/11/2024	--	22.82	--	-0.29	unconfined		0.73
S-414	12/17/2024	--	22.55	--	-0.02	unconfined		0.73
S-414	1/8/2025	--	22.39	--	0.14	unconfined		0.73
S-414	1/16/2025	--	22.67	--	-0.14	unconfined		0.73
S-414	1/24/2025	--	22.92	--	-0.39	unconfined		0.73
S-414	1/29/2025	--	22.98	--	-0.45	unconfined		0.73
S-414	2/5/2025	--	22.88	--	-0.35	unconfined		0.73
S-414	2/12/2025	--	22.94	--	-0.41	unconfined		0.73
S-414	2/20/2025	--	22.92	--	-0.39	unconfined		0.73
S-428	10/10/2018	--	9.94	--	0.90	unconfined		--
S-428	11/13/2018	--	9.77	--	1.07	unconfined		--
S-428	12/27/2018	--	9.49	--	1.35	unconfined		--
S-428	1/2/2019	--	9.17	--	1.67	unconfined		--
S-428	2/12/2019	--	9.49	--	1.35	unconfined		--
S-428	3/21/2019	--	9.14	--	1.70	unconfined		--
S-428	4/1/2019	--	9.93	--	0.91	unconfined		--
S-428	5/9/2019	--	9.89	--	0.95	unconfined		--
S-428	6/13/2019	--	9.97	--	0.87	unconfined		--
S-428	7/5/2019	--	9.51	--	1.33	unconfined		--
S-428	8/6/2019	--	9.71	--	1.13	unconfined		--
S-428	9/6/2019	--	10.12	--	0.72	unconfined		--
S-428	11/14/2019	--	10.80	--	0.04	unconfined		--
S-428	11/22/2019	--	10.78	--	0.06	unconfined		--
S-428	12/10/2019	--	10.85	--	-0.01	unconfined		--
S-428	4/17/2020	--	10.32	--	0.52	unconfined		--
S-428	4/20/2020	--	10.26	--	0.58	unconfined		--
S-428	4/21/2020	--	10.27	--	0.57	unconfined		--
S-428	4/23/2020	--	10.30	--	0.54	unconfined		--
S-428	4/24/2020	--	8.00	--	2.84	unconfined		--
S-428	5/4/2020	--	10.22	--	0.62	unconfined		--
S-428	5/7/2020	--	10.25	--	0.59	unconfined		--
S-428	5/12/2020	--	10.52	--	0.32	unconfined		--
S-428	5/14/2020	10.54	10.54	<0.01	0.30	unconfined		--
S-428	5/18/2020	--	10.54	--	0.30	unconfined		--
S-428	5/19/2020	--	10.56	--	0.28	unconfined		--
S-428	5/21/2020	--	10.56	--	0.28	unconfined		--
S-428	5/28/2020	--	10.61	--	0.23	unconfined		--
S-428	6/4/2020	--	10.49	--	0.35	unconfined		--
S-428	6/5/2020	--	10.49	--	0.35	unconfined		--
S-428	6/8/2020	--	10.45	--	0.39	unconfined		--
S-428	6/11/2020	--	10.61	--	0.23	unconfined		--
S-428	6/16/2020	--	10.57	--	0.27	unconfined		--
S-428	6/18/2020	--	10.57	--	0.27	unconfined		--
S-428	6/19/2020	--	10.46	--	0.38	unconfined		--
S-428	6/26/2020	--	10.59	--	0.25	unconfined		--
S-428	7/1/2020	--	10.64	--	0.20	unconfined		--
S-428	7/7/2020	--	10.80	--	0.04	unconfined		--
S-428	7/9/2020	--	8.60	--	2.24	unconfined		--
S-428	7/14/2020	--	10.95	--	-0.11	unconfined		--
S-428	7/17/2020	--	10.41	--	0.43	unconfined		--
S-428	7/24/2020	--	10.50	--	0.34	unconfined		--
S-428	7/28/2020	--	10.50	--	0.34	unconfined		--
S-428	7/30/2020	--	10.63	--	0.21	unconfined		--

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-428	8/4/2020	--	10.58	--	0.26	unconfined		--
S-428	8/6/2020	--	10.33	--	0.51	unconfined		--
S-428	8/18/2020	--	10.39	--	0.45	unconfined		--
S-428	8/25/2020	--	10.52	--	0.32	unconfined		--
S-428	9/3/2020	--	10.51	--	0.33	unconfined		--
S-428	9/16/2020	--	10.51	--	0.33	unconfined		--
S-428	10/1/2020	--	10.61	--	0.23	unconfined		--
S-428	10/19/2020	--	10.64	--	0.20	unconfined		--
S-428	10/23/2020	--	10.25	--	0.59	unconfined		--
S-428	11/2/2020	--	10.52	--	0.32	unconfined		--
S-428	11/9/2020	--	10.61	--	0.23	unconfined		--
S-428	11/10/2020	--	10.60	--	0.24	unconfined		--
S-428	11/19/2020	--	10.40	--	0.44	unconfined		--
S-428	11/23/2020	--	10.21	--	0.63	unconfined		--
S-428	11/30/2020	--	10.29	--	0.55	unconfined		--
S-428	12/4/2020	--	10.25	--	0.59	unconfined		--
S-428	12/8/2020	--	10.85	--	-0.01	unconfined		--
S-428	12/11/2020	--	10.23	--	0.61	unconfined		--
S-428	12/14/2020	--	10.17	--	0.67	unconfined		--
S-428	12/18/2020	--	10.19	--	0.65	unconfined		--
S-428	12/21/2020	--	9.90	--	0.94	unconfined		--
S-428	12/31/2020	--	9.80	--	1.04	unconfined		--
S-428	1/4/2021	--	9.61	--	1.23	unconfined		--
S-428	1/8/2021	--	9.60	--	1.24	unconfined		--
S-428	1/15/2021	--	9.38	--	1.46	unconfined		--
S-428	1/25/2021	--	10.20	--	0.64	unconfined		--
S-428	2/3/2021	--	11.02	--	-0.18	unconfined		--
S-428	2/4/2021	--	10.12	--	0.72	unconfined		--
S-428	2/9/2021	--	10.18	--	0.66	unconfined		--
S-428	2/23/2021	--	9.86	--	0.98	unconfined		--
S-428	2/26/2021	--	10.09	--	0.75	unconfined		--
S-428	3/1/2021	--	9.63	--	1.21	unconfined		--
S-428	3/5/2021	--	9.79	--	1.05	unconfined		--
S-428	3/12/2021	--	10.01	--	0.83	unconfined		--
S-428	3/15/2021	--	10.11	--	0.73	unconfined		--
S-428	3/19/2021	--	10.09	--	0.75	unconfined		--
S-428	3/25/2021	--	9.85	--	0.99	unconfined		--
S-428	3/29/2021	--	9.91	--	0.93	unconfined		--
S-428	4/1/2021	--	10.03	--	0.81	unconfined		--
S-428	4/7/2021	--	10.04	--	0.80	unconfined		--
S-428	4/9/2021	--	9.90	--	0.94	unconfined		--
S-428	4/20/2021	--	9.78	--	1.06	unconfined		--
S-428	5/3/2021	--	9.48	--	1.36	unconfined		--
S-428	5/6/2021	--	10.10	--	0.74	unconfined		--
S-428	5/11/2021	--	10.12	--	0.72	unconfined		--
S-428	5/14/2021	--	10.13	--	0.71	unconfined		--
S-428	5/20/2021	--	10.35	--	0.49	unconfined		--
S-428	5/25/2021	--	10.37	--	0.47	unconfined		--
S-428	6/3/2021	--	10.23	--	0.61	unconfined		--
S-428	6/4/2021	--	10.20	--	0.64	unconfined		--
S-428	6/14/2021	--	10.08	--	0.76	unconfined		--
S-428	6/18/2021	--	10.18	--	0.66	unconfined		--
S-428	6/22/2021	--	9.95	--	0.89	unconfined		--
S-428	6/23/2021	--	10.18	--	0.66	unconfined		--
S-428	6/24/2021	--	10.15	--	0.69	unconfined		--
S-428	6/29/2021	--	10.15	--	0.69	unconfined		--
S-428	7/1/2021	--	10.17	--	0.67	unconfined		--
S-428	7/6/2021	--	10.02	--	0.82	unconfined		--
S-428	7/9/2021	--	10.08	--	0.76	unconfined		--
S-428	7/20/2021	--	9.07	--	1.77	unconfined		--
S-428	7/23/2021	--	9.90	--	0.94	unconfined		--
S-428	7/27/2021	--	9.95	--	0.89	unconfined		--
S-428	7/30/2021	--	9.93	--	0.91	unconfined		--
S-428	8/10/2021	--	10.15	--	0.69	unconfined		--
S-428	8/13/2021	--	10.22	--	0.62	unconfined		--
S-428	8/20/2021	--	10.25	--	0.59	unconfined		--
S-428	8/24/2021	--	10.16	--	0.68	unconfined		--

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S-428	8/27/2021	--	10.10	--	0.74	unconfined		--
S-428	9/3/2021	--	9.63	--	1.21	unconfined		--
S-428	9/10/2021	--	9.58	--	1.26	unconfined		--
S-428	9/16/2021	--	9.83	--	1.01	unconfined		--
S-428	9/22/2021	--	9.80	--	1.04	unconfined		--
S-428	9/24/2021	--	9.60	--	1.24	unconfined		--
S-428	9/29/2021	--	9.76	--	1.08	unconfined		--
S-428	10/5/2021	--	9.81	--	1.03	unconfined		--
S-428	10/14/2021	--	9.77	--	1.07	unconfined		--
S-428	10/21/2021	--	10.02	--	0.82	unconfined		--
S-428	10/28/2021	--	9.96	--	0.88	unconfined		--
S-428	11/4/2021	--	9.79	--	1.05	unconfined		--
S-428	11/11/2021	--	9.93	--	0.91	unconfined		--
S-428	1/4/2022	--	10.79	--	0.05	unconfined		--
S-428	1/12/2022	--	10.42	--	0.42	unconfined		--
S-428	1/25/2022	--	10.30	--	0.54	unconfined		--
S-428	2/8/2022	--	10.78	--	0.06	unconfined		--
S-428	2/14/2022	--	10.81	--	0.03	unconfined		--
S-428	2/24/2022	--	9.33	--	1.51	unconfined		--
S-428	2/28/2022	--	10.93	--	-0.09	unconfined		--
S-428	3/17/2022	--	11.08	--	-0.24	unconfined		--
S-428	3/24/2022	--	10.92	--	-0.08	unconfined		--
S-428	3/31/2022	--	10.78	--	0.06	unconfined		--
S-428	4/8/2022	--	10.85	--	-0.01	unconfined		--
S-428	4/12/2022	--	10.31	--	0.53	unconfined		--
S-428	4/20/2022	--	10.28	--	0.56	unconfined		--
S-428	6/15/2022	--	8.58	--	2.26	unconfined		--
S-428	7/14/2022	--	10.36	--	0.48	unconfined		--
S-428	7/18/2022	--	10.36	--	0.48	unconfined		--
S-428	7/26/2022	--	10.61	--	0.23	unconfined		--
S-428	8/1/2022	--	10.53	--	0.31	unconfined		--
S-428	8/9/2022	--	10.79	--	0.05	unconfined		--
S-428	8/24/2022	--	10.80	--	0.04	unconfined		--
S-428	8/29/2022	--	10.84	--	0.00	unconfined		--
S-428	9/8/2022	--	10.85	--	-0.01	unconfined		--
S-428	9/22/2022	--	10.81	--	0.03	unconfined		--
S-428	9/28/2022	--	11.00	--	-0.16	unconfined		--
S-428	10/13/2022	--	10.59	--	0.25	unconfined		--
S-428	10/20/2022	--	10.68	--	0.16	unconfined		--
S-428	10/27/2022	--	10.45	--	0.39	unconfined		--
S-428	11/1/2022	--	10.53	--	0.31	unconfined		--
S-428	11/10/2022	--	10.85	--	-0.01	unconfined		--
S-428	11/16/2022	--	10.79	--	0.05	unconfined		--
S-428	11/22/2022	--	11.00	--	-0.16	unconfined		--
S-428	11/30/2022	--	10.94	--	-0.10	unconfined		--
S-428	12/14/2022	--	10.09	--	0.75	unconfined		--
S-428	12/21/2022	--	9.80	--	1.04	unconfined		--
S-428	12/28/2022	--	9.70	--	1.14	unconfined		--
S-428	1/3/2023	--	9.65	--	1.19	unconfined		--
S-428	1/10/2023	--	9.56	--	1.28	unconfined		--
S-428	1/19/2023	--	9.50	--	1.34	unconfined		--
S-428	1/26/2023	--	9.01	--	1.83	unconfined		--
S-428	1/31/2023	--	9.77	--	1.07	unconfined		--
S-428	2/7/2023	--	10.28	--	0.56	unconfined		--
S-428	2/16/2023	--	10.30	--	0.54	unconfined		--
S-428	2/28/2023	--	10.25	--	0.59	unconfined		--
S-428	3/7/2023	--	10.25	--	0.59	unconfined		--
S-428	3/16/2023	--	10.49	--	0.35	unconfined		--
S-428	3/23/2023	--	10.50	--	0.34	unconfined		--
S-428	3/29/2023	--	10.56	--	0.28	unconfined		--
S-428	4/5/2023	--	10.65	--	0.19	unconfined		--
S-428	4/13/2023	--	10.71	--	0.13	unconfined		--
S-428	4/19/2023	--	10.78	--	0.06	unconfined		--
S-428	4/26/2023	--	10.78	--	0.06	unconfined		--
S-428	5/3/2023	--	10.13	--	0.71	unconfined		--
S-428	5/10/2023	--	10.25	--	0.59	unconfined		--
S-428	5/16/2023	--	10.36	--	0.48	unconfined		--

Table 3-2
Well Gauging Summary, 2018 to Present
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC, Philadelphia, PA

Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-428	5/23/2023	--	10.55	--	0.29	unconfined		--
S-428	5/31/2023	--	10.66	--	0.18	unconfined		--
S-428	6/7/2023	--	10.65	--	0.19	unconfined		--
S-428	6/20/2023	--	10.63	--	0.21	unconfined		--
S-428	6/27/2023	--	10.54	--	0.30	unconfined		--
S-428	7/19/2023	--	9.46	--	1.38	unconfined		--
S-428	7/26/2023	--	9.59	--	1.25	unconfined		--
S-428	8/2/2023	--	9.70	--	1.14	unconfined		--
S-428	8/9/2023	--	9.65	--	1.19	unconfined		--
S-428	8/23/2023	--	9.84	--	1.00	unconfined		--
S-428	8/30/2023	--	9.58	--	1.26	unconfined		--
S-428	9/5/2023	--	10.08	--	0.76	unconfined		--
S-428	9/15/2023	--	10.09	--	0.75	unconfined		--
S-428	9/20/2023	--	10.03	--	0.81	unconfined		--
S-428	9/27/2023	--	9.54	--	1.30	unconfined		--
S-428	10/4/2023	--	9.54	--	1.30	unconfined		--
S-428	10/17/2023	--	9.82	--	1.02	unconfined		--
S-428	10/26/2023	--	--	--	--	unconfined	Unable to access	--
S-428	11/1/2023	--	--	--	--	unconfined	Unable to access	--
S-428	11/9/2023	--	--	--	--	unconfined	Unable to access	--
S-428	11/13/2023	--	--	--	--	unconfined	Unable to access	--
S-428	11/22/2023	--	--	--	--	unconfined	Unable to access	--
S-428	11/29/2023	--	--	--	--	unconfined	Unable to access	--
S-428	12/14/2023	--	--	--	--	unconfined	Unable to access	--
S-428	12/20/2023	--	--	--	--	unconfined	Unable to access	--
S-428	1/3/2024	--	--	--	--	unconfined	Unable to access	--
S-428	1/11/2024	--	--	--	--	unconfined	Unable to access	--
S-428	1/24/2024	--	--	--	--	unconfined	Unable to access	--
S-428	1/30/2024	--	--	--	--	unconfined	Unable to access	--
S-428	2/5/2024	--	--	--	--	unconfined	Unable to access	--
S-428	2/15/2024	--	--	--	--	unconfined	Unable to access	--
S-428	2/21/2024	--	--	--	--	unconfined	Unable to access	--
S-428	2/28/2024	--	--	--	--	unconfined	Unable to access	--
S-428	3/5/2024	--	--	--	--	unconfined	Unable to access	--
S-428	3/20/2024	--	--	--	--	unconfined	Unable to access	--
S-428	3/28/2024	--	--	--	--	unconfined	Unable to access	--
S-428	4/3/2024	--	--	--	--	unconfined	Unable to access	--
S-428	4/9/2024	--	--	--	--	unconfined	Unable to access	--
S-428	4/25/2024	--	--	--	--	unconfined	Unable to access	--
S-428	4/30/2024	--	--	--	--	unconfined	Unable to access	--
S-428	5/8/2024	--	--	--	--	unconfined	Unable to access	--
S-428	5/20/2024	--	--	--	--	unconfined	Unable to access	--
S-428	5/31/2024	--	--	--	--	unconfined	Unable to access	--
S-428	6/5/2024	--	--	--	--	unconfined	Unable to access	--
S-428	6/12/2024	--	--	--	--	unconfined	Unable to access	--
S-428	6/19/2024	--	--	--	--	unconfined	Unable to access	--
S-428	6/26/2024	--	--	--	--	unconfined	Destroyed	--
S-429	9/26/2018	20.16	22.41	2.25	0.42	unconfined		0.72
S-429	9/27/2018	20.10	22.41	2.31	0.47	unconfined		0.72
S-429	10/1/2018	20.07	22.34	2.27	0.51	unconfined		0.72
S-429	1/9/2019	19.15	20.70	1.55	1.63	unconfined		0.72
S-429	3/14/2019	19.55	20.68	1.13	1.35	unconfined		0.72
S-429	10/18/2019	20.90	21.42	0.52	0.17	unconfined		0.72
S-429	10/25/2019	20.96	21.02	0.06	0.23	unconfined		0.72
S-429	11/1/2019	20.78	21.09	0.31	0.34	unconfined		0.72
S-429	11/14/2019	20.93	21.15	0.22	0.22	unconfined		0.72
S-429	11/22/2019	21.02	21.24	0.22	0.13	unconfined		0.72
S-429	1/23/2020	20.94	22.18	1.24	-0.07	unconfined		0.72
S-429	1/24/2020	20.93	22.20	1.27	-0.07	unconfined		0.72
S-429	1/27/2020	21.05	21.13	0.08	0.14	unconfined		0.72
S-429	1/28/2020	21.08	21.15	0.07	0.11	unconfined		0.72
S-429	1/30/2020	21.08	21.31	0.23	0.07	unconfined		0.72
S-429	1/31/2020	21.03	21.53	0.50	0.04	unconfined		0.72
S-429	2/3/2020	20.51	21.60	1.09	0.40	unconfined		0.72
S-429	2/4/2020	20.69	21.60	0.91	0.27	unconfined		0.72
S-429	2/7/2020	20.71	20.81	0.10	0.47	unconfined		0.72
S-429	2/13/2020	20.78	20.88	0.10	0.40	unconfined		0.72

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-429	2/28/2020	20.88	22.13	1.25	-0.02	unconfined		0.72
S-429	3/2/2020	20.91	21.98	1.07	0.00	unconfined		0.72
S-429	3/17/2020	20.91	21.51	0.60	0.13	unconfined		0.72
S-429	3/24/2020	20.93	21.48	0.55	0.13	unconfined		0.72
S-429	4/16/2020	20.59	20.94	0.35	0.52	unconfined		0.72
S-429	4/23/2020	20.48	21.16	0.68	0.54	unconfined		0.72
S-429	4/24/2020	20.95	21.34	0.39	0.15	unconfined		0.72
S-429	5/21/2020	20.91	21.09	0.18	0.25	unconfined		0.72
S-429	5/22/2020	20.90	21.10	0.20	0.25	unconfined		0.72
S-429	5/26/2020	20.98	21.41	0.43	0.11	unconfined		0.72
S-429	5/27/2020	20.99	21.45	0.46	0.09	unconfined		0.72
S-429	5/28/2020	21.15	22.45	1.30	-0.30	unconfined		0.72
S-429	6/5/2020	20.56	21.49	0.93	0.39	unconfined		0.72
S-429	6/8/2020	20.63	21.20	0.57	0.42	unconfined		0.72
S-429	6/9/2020	20.68	21.85	1.17	0.20	unconfined		0.72
S-429	7/1/2020	20.56	20.93	0.37	0.55	unconfined		0.72
S-429	7/7/2020	21.03	21.67	0.64	0.00	unconfined		0.72
S-429	7/9/2020	21.03	21.14	0.11	0.15	unconfined		0.72
S-429	7/22/2020	20.52	20.54	0.02	0.68	unconfined		0.72
S-429	8/10/2020	19.94	20.40	0.46	1.14	unconfined		0.72
S-429	8/13/2020	20.33	20.42	0.09	0.85	unconfined		0.72
S-429	9/8/2020	20.55	21.25	0.70	0.47	unconfined		0.72
S-429	9/9/2020	20.65	20.85	0.20	0.50	unconfined		0.72
S-429	9/18/2020	20.52	21.05	0.53	0.54	unconfined		0.72
S-429	11/2/2020	20.45	21.10	0.65	0.58	unconfined		0.72
S-429	12/4/2020	20.51	21.03	0.52	0.56	unconfined		0.72
S-429	1/25/2021	20.65	21.15	0.50	0.42	unconfined		0.72
S-429	1/29/2021	20.48	21.30	0.82	0.50	unconfined		0.72
S-429	2/3/2021	20.32	21.44	1.12	0.58	unconfined		0.72
S-429	2/3/2021	20.32	21.44	1.12	0.58	unconfined		0.72
S-429	2/12/2021	20.28	21.11	0.83	0.70	unconfined		0.72
S-429	2/17/2021	20.23	21.05	0.82	0.75	unconfined		0.72
S-429	3/19/2021	20.12	20.94	0.82	0.86	unconfined		0.72
S-429	4/23/2021	19.95	20.73	0.78	1.04	unconfined		0.72
S-429	5/3/2021	19.96	20.72	0.76	1.04	unconfined		0.72
S-429	5/6/2021	20.10	20.92	0.82	0.88	unconfined		0.72
S-429	5/11/2021	20.13	20.96	0.83	0.85	unconfined		0.72
S-429	5/14/2021	20.21	21.02	0.81	0.77	unconfined		0.72
S-429	5/20/2021	20.31	21.12	0.81	0.67	unconfined		0.72
S-429	5/25/2021	20.31	21.28	0.97	0.63	unconfined		0.72
S-429	6/3/2021	20.04	20.80	0.76	0.96	unconfined		0.72
S-429	6/4/2021	20.03	20.78	0.75	0.97	unconfined		0.72
S-429	6/14/2021	19.88	20.61	0.73	1.13	unconfined		0.72
S-429	6/18/2021	19.63	20.34	0.71	1.38	unconfined		0.72
S-429	6/22/2021	19.72	20.52	0.80	1.27	unconfined		0.72
S-429	6/23/2021	19.63	20.34	0.71	1.38	unconfined		0.72
S-429	6/24/2021	19.72	20.73	1.01	1.21	unconfined		0.72
S-429	6/24/2021	19.72	20.73	1.01	1.21	unconfined		0.72
S-429	6/29/2021	19.72	20.73	1.01	1.21	unconfined		0.72
S-429	7/1/2021	20.03	20.94	0.91	0.93	unconfined		0.72
S-429	7/6/2021	19.87	20.64	0.77	1.13	unconfined		0.72
S-429	7/9/2021	19.94	20.78	0.84	1.04	unconfined		0.72
S-429	7/13/2021	19.95	20.78	0.83	1.03	unconfined		0.72
S-429	7/20/2021	19.66	20.38	0.72	1.35	unconfined		0.72
S-429	7/23/2021	19.76	20.43	0.67	1.26	unconfined		0.72
S-429	7/27/2021	19.83	20.60	0.77	1.17	unconfined		0.72
S-429	7/30/2021	19.82	20.63	0.81	1.16	unconfined		0.72
S-429	8/3/2021	19.98	20.87	0.89	0.98	unconfined		
S-429	8/10/2021	20.88	21.10	0.22	0.27	unconfined		
S-429	8/13/2021	20.80	20.88	0.08	0.39	unconfined		
S-429	8/20/2021	20.13	20.96	0.83	0.85	unconfined		
S-429	8/24/2021	20.00	20.71	0.71	1.01	unconfined		
S-429	8/27/2021	19.97	20.70	0.73	1.04	unconfined		
S-429	9/3/2021	19.32	20.13	0.81	1.66	unconfined		
S-429	9/10/2021	19.49	20.21	0.72	1.52	unconfined		
S-429	9/16/2021	19.77	20.43	0.66	1.26	unconfined		
S-429	9/22/2021	19.76	20.48	0.72	1.25	unconfined		

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-429	9/24/2021	19.59	20.31	0.72	1.42	unconfined		
S-429	9/29/2021	19.70	20.38	0.68	1.32	unconfined		
S-429	10/5/2021	19.82	20.60	0.78	1.17	unconfined		
S-429	10/14/2021	19.67	20.36	0.69	1.35	unconfined		
S-429	10/21/2021	19.95	20.73	0.78	1.04	unconfined		0.72
S-429	10/28/2021	19.85	20.47	0.62	1.19	unconfined		0.72
S-429	11/4/2021	19.77	20.40	0.63	1.26	unconfined		0.72
S-429	11/11/2021	19.90	20.63	0.73	1.11	unconfined		0.72
S-429	11/18/2021	20.09	20.89	0.80	0.90	unconfined		0.72
S-429	11/24/2021	20.28	21.20	0.92	0.67	unconfined		0.72
S-429	9/5/2023	--	20.45	--	0.76	unconfined		0.72
S-429	9/15/2023	--	20.48	--	0.73	unconfined		0.72
S-429	9/20/2023	--	20.39	--	0.82	unconfined		0.72
S-429	9/27/2023	--	19.84	--	1.37	unconfined		0.72
S-429	10/4/2023	--	19.87	--	1.34	unconfined		0.72
S-429	10/17/2023	--	20.15	--	1.06	unconfined		0.72
S-429	10/26/2023	--	20.50	--	0.71	unconfined		0.72
S-429	11/1/2023	--	20.51	--	0.70	unconfined		0.72
S-429	11/9/2023	--	20.60	--	0.61	unconfined		0.72
S-429	11/13/2023	--	20.77	--	0.44	unconfined		0.72
S-429	11/22/2023	--	20.74	--	0.47	unconfined		0.72
S-429	11/29/2023	--	20.73	--	0.48	unconfined		0.72
S-429	12/14/2023	--	20.33	--	0.88	unconfined		0.72
S-429	12/20/2023	--	19.37	--	1.84	unconfined		0.72
S-429	1/3/2024	--	19.35	--	1.86	unconfined		0.72
S-429	1/11/2024	--	18.78	--	2.43	unconfined		0.72
S-429	1/18/2024	--	18.95	--	2.26	unconfined		0.72
S-429	1/24/2024	--	19.55	--	1.66	unconfined		0.72
S-429	1/30/2024	--	19.06	--	2.15	unconfined		0.72
S-429	2/5/2024	--	19.05	--	2.16	unconfined		0.72
S-429	2/15/2024	--	19.53	--	1.68	unconfined		0.72
S-429	2/21/2024	--	19.83	--	1.38	unconfined		0.72
S-429	2/28/2024	--	19.82	--	1.39	unconfined		0.72
S-429	3/5/2024	--	19.95	--	1.26	unconfined		0.72
S-429	3/20/2024	--	19.48	--	1.73	unconfined		0.72
S-429	3/28/2024	--	19.96	--	1.25	unconfined		0.72
S-429	4/3/2024	--	19.94	--	1.27	unconfined		0.72
S-429	4/9/2024	--	18.45	--	2.76	unconfined		0.72
S-429	4/25/2024	--	19.17	--	2.04	unconfined		0.72
S-429	4/30/2024	--	19.26	--	1.95	unconfined		0.72
S-429	5/8/2024	--	19.43	--	1.78	unconfined		0.72
S-429	5/20/2024	--	19.64	--	1.57	unconfined		0.72
S-429	5/31/2024	--	19.92	--	1.29	unconfined		0.72
S-429	6/5/2024	--	20.05	--	1.16	unconfined		0.72
S-429	6/12/2024	--	19.97	--	1.24	unconfined		0.72
S-429	6/19/2024	--	20.19	--	1.02	unconfined		0.72
S-429	6/26/2024	--	20.31	--	0.90	unconfined		0.72
S-429	7/2/2024	--	20.22	--	0.99	unconfined		0.72
S-429	7/10/2024	--	19.93	--	1.28	unconfined		0.72
S-429	7/16/2024	--	20.04	--	1.17	unconfined		0.72
S-429	7/24/2024	--	20.23	--	0.98	unconfined		0.72
S-429	8/1/2024	--	20.50	--	0.71	unconfined		0.72
S-429	8/6/2024	--	20.47	--	0.74	unconfined		0.72
S-429	8/23/2024	--	19.68	--	1.53	unconfined		0.72
S-429	8/28/2024	--	19.85	--	1.36	unconfined		0.72
S-429	9/4/2024	--	20.10	--	1.11	unconfined		0.72
S-429	9/11/2024	--	20.23	--	0.98	unconfined		0.72
S-429	9/18/2024	--	20.40	--	0.81	unconfined		0.72
S-429	9/25/2024	--	20.28	--	0.93	unconfined		0.72
S-429	10/1/2024	--	20.38	--	0.83	unconfined		0.72
S-429	10/14/2024	--	20.78	--	0.43	unconfined		0.72
S-429	10/28/2024	--	21.06	--	0.15	unconfined		0.72
S-429	11/8/2024	--	21.31	--	-0.10	unconfined		0.72
S-429	11/15/2024	--	21.34	--	-0.13	unconfined		0.72
S-429	11/20/2024	--	21.28	--	-0.07	unconfined		0.72
S-429	11/26/2024	--	21.40	--	-0.19	unconfined		0.72
S-429	12/4/2024	--	21.46	--	-0.25	unconfined		0.72

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-429	12/11/2024	--	21.44	--	-0.23	unconfined		0.72
S-429	12/17/2024	--	21.22	--	-0.01	unconfined		0.72
S-429	1/8/2025	--	21.12	--	0.09	unconfined		0.72
S-429	1/16/2025	--	21.40	--	-0.19	unconfined		0.72
S-429	1/24/2025	--	21.54	--	-0.33	unconfined		0.72
S-429	1/29/2025	--	21.58	--	-0.37	unconfined		0.72
S-429	2/5/2025	--	21.58	--	-0.37	unconfined		0.72
S-429	2/12/2025	--	21.59	--	-0.38	unconfined		0.72
S-429	2/20/2025	--	21.51	--	-0.30	unconfined		0.72
S-430	9/28/2018	--	11.49	--	1.60	unconfined		0.72
S-430	10/1/2018	11.33	12.34	1.01	1.48	unconfined		0.72
S-430	10/3/2018	11.14	12.72	1.58	1.51	unconfined		0.72
S-430	10/4/2018	10.98	12.84	1.86	1.59	unconfined		0.72
S-430	10/5/2018	11.00	13.05	2.05	1.52	unconfined		0.72
S-430	10/8/2018	10.86	13.24	2.38	1.57	unconfined		0.72
S-430	10/9/2018	10.88	13.30	2.42	1.54	unconfined		0.72
S-430	10/10/2018	11.16	12.86	1.70	1.46	unconfined		0.72
S-430	10/16/2018	11.35	13.35	2.00	1.18	unconfined		0.72
S-430	10/22/2018	11.82	12.91	1.09	0.97	unconfined		0.72
S-430	11/6/2018	11.16	12.86	1.70	1.46	unconfined		0.72
S-430	11/13/2018	11.09	12.83	1.74	1.52	unconfined		0.72
S-430	11/13/2018	11.09	12.83	1.74	1.52	unconfined		0.72
S-430	11/14/2018	11.36	13.03	1.67	1.27	unconfined		0.72
S-430	11/20/2018	10.88	12.66	1.78	1.71	unconfined		0.72
S-430	12/3/2018	10.56	12.41	1.85	2.02	unconfined		0.72
S-430	12/6/2018	11.06	11.99	0.93	1.77	unconfined		0.72
S-430	12/11/2018	11.40	12.01	0.61	1.52	unconfined		0.72
S-430	12/13/2018	10.95	12.05	1.10	1.83	unconfined		0.72
S-430	12/20/2018	11.48	11.95	0.47	1.48	unconfined		0.72
S-430	12/27/2018	11.61	12.25	0.64	1.30	unconfined		0.72
S-430	1/4/2019	10.86	11.84	0.98	1.96	unconfined		0.72
S-430	1/9/2019	11.02	11.80	0.78	1.85	unconfined		0.72
S-430	1/11/2019	11.63	12.17	0.54	1.31	unconfined		0.72
S-430	1/14/2019	11.65	12.15	0.50	1.30	unconfined		0.72
S-430	1/23/2019	11.92	12.68	0.76	0.96	unconfined		0.72
S-430	1/30/2019	11.39	11.95	0.56	1.54	unconfined		0.72
S-430	2/1/2019	11.74	12.22	0.48	1.22	unconfined		0.72
S-430	2/6/2019	11.62	12.85	1.23	1.13	unconfined		0.72
S-430	2/7/2019	11.62	12.83	1.21	1.13	unconfined		0.72
S-430	2/11/2019	12.48	13.30	0.82	0.38	unconfined		0.72
S-430	2/12/2019	11.48	13.19	1.71	1.13	unconfined		0.72
S-430	2/13/2019	11.48	13.19	1.71	1.13	unconfined		0.72
S-430	2/15/2019	11.60	12.28	0.68	1.30	unconfined		0.72
S-430	2/18/2019	11.43	12.17	0.74	1.45	unconfined		0.72
S-430	2/22/2019	11.59	12.26	0.67	1.31	unconfined		0.72
S-430	2/25/2019	11.74	12.35	0.61	1.18	unconfined		0.72
S-430	3/1/2019	11.56	12.67	1.11	1.22	unconfined		0.72
S-430	3/4/2019	11.13	12.65	1.52	1.54	unconfined		0.72
S-430	3/12/2019	11.54	12.40	0.86	1.31	unconfined		0.72
S-430	3/13/2019	11.63	12.18	0.55	1.31	unconfined		0.72
S-430	3/18/2019	11.45	12.57	1.12	1.33	unconfined		0.72
S-430	3/21/2019	11.28	12.79	1.51	1.39	unconfined		0.72
S-430	3/22/2019	11.28	12.79	1.51	1.39	unconfined		0.72
S-430	3/25/2019	11.79	12.91	1.12	0.99	unconfined		0.72
S-430	3/29/2019	11.56	12.70	1.14	1.21	unconfined		0.72
S-430	4/1/2019	11.73	12.80	1.07	1.06	unconfined		0.72
S-430	4/2/2019	11.73	12.80	1.07	1.06	unconfined		0.72
S-430	4/5/2019	11.86	13.48	1.62	0.78	unconfined		0.72
S-430	4/8/2019	11.81	13.38	1.57	0.84	unconfined		0.72
S-430	4/12/2019	11.72	12.88	1.16	1.05	unconfined		0.72
S-430	4/15/2019	11.51	12.67	1.16	1.26	unconfined		0.72
S-430	4/19/2019	11.75	12.84	1.09	1.04	unconfined		0.72
S-430	4/24/2019	11.73	12.62	0.89	1.11	unconfined		0.72
S-430	4/26/2019	11.69	12.25	0.56	1.24	unconfined		0.72
S-430	4/29/2019	12.79	13.47	0.68	0.11	unconfined		0.72
S-430	5/3/2019	11.68	12.77	1.09	1.11	unconfined		0.72
S-430	5/9/2019	11.53	12.74	1.21	1.22	unconfined		0.72

Table 3-2
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Bellwether District Holdings, LLC, Philadelphia, PA

Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-430	5/10/2019	11.53	12.74	1.21	1.22	unconfined		0.72
S-430	5/15/2019	10.90	12.15	1.25	1.84	unconfined		0.72
S-430	5/17/2019	10.97	11.78	0.81	1.89	unconfined		0.72
S-430	5/20/2019	11.22	11.72	0.50	1.73	unconfined		0.72
S-430	5/24/2019	11.71	11.96	0.25	1.31	unconfined		0.72
S-430	5/28/2019	11.61	11.79	0.18	1.43	unconfined		0.72
S-430	5/31/2019	11.54	11.77	0.23	1.49	unconfined		0.72
S-430	6/10/2019	11.85	12.15	0.30	1.16	unconfined		0.72
S-430	6/13/2019	11.59	11.92	0.33	1.41	unconfined		0.72
S-430	6/14/2019	11.59	11.92	0.33	1.41	unconfined		0.72
S-430	6/17/2019	11.79	12.01	0.22	1.24	unconfined		0.72
S-430	6/26/2019	11.27	11.75	0.48	1.69	unconfined		0.72
S-430	6/28/2019	11.42	11.69	0.27	1.59	unconfined		0.72
S-430	7/1/2019	11.43	11.62	0.19	1.61	unconfined		0.72
S-430	7/3/2019	11.61	11.73	0.12	1.45	unconfined		0.72
S-430	7/5/2019	11.49	11.71	0.22	1.54	unconfined		0.72
S-430	7/8/2019	11.49	11.71	0.22	1.54	unconfined		0.72
S-430	7/15/2019	11.26	11.52	0.26	1.76	unconfined		0.72
S-430	7/22/2019	11.67	11.88	0.21	1.36	unconfined		0.72
S-430	7/29/2019	11.56	11.78	0.22	1.47	unconfined		0.72
S-430	8/2/2019	11.74	11.99	0.25	1.28	unconfined		0.72
S-430	8/6/2019	11.74	11.99	0.25	1.28	unconfined		0.72
S-430	8/12/2019	11.68	11.83	0.15	1.37	unconfined		0.72
S-430	8/16/2019	11.77	12.03	0.26	1.25	unconfined		0.72
S-430	8/19/2019	11.76	12.02	0.26	1.26	unconfined		0.72
S-430	8/23/2019	11.88	12.17	0.29	1.13	unconfined		0.72
S-430	9/6/2019	11.91	12.23	0.32	1.09	unconfined		0.72
S-430	10/18/2019	12.48	12.94	0.46	0.48	unconfined		0.72
S-430	11/14/2019	12.57	12.78	0.21	0.46	unconfined		0.72
S-430	11/22/2019	12.46	12.67	0.21	0.57	unconfined		0.72
S-430	12/10/2019	12.60	13.00	0.40	0.38	unconfined		0.72
S-430	12/16/2019	12.76	13.27	0.51	0.19	unconfined		0.72
S-430	12/30/2019	12.49	12.88	0.39	0.49	unconfined		0.72
S-430	1/2/2020	12.41	12.79	0.38	0.57	unconfined		0.72
S-430	1/6/2020	12.39	12.68	0.29	0.62	unconfined		0.72
S-430	1/9/2020	12.59	12.99	0.40	0.39	unconfined		0.72
S-430	1/13/2020	12.77	13.28	0.51	0.18	unconfined		0.72
S-430	1/17/2020	12.82	13.31	0.49	0.13	unconfined		0.72
S-430	1/21/2020	12.68	13.11	0.43	0.29	unconfined		0.72
S-430	1/23/2020	12.72	13.18	0.46	0.24	unconfined		0.72
S-430	1/27/2020	12.39	12.47	0.08	0.68	unconfined		0.72
S-430	1/28/2020	12.51	12.81	0.30	0.50	unconfined		0.72
S-430	1/30/2020	11.49	12.84	1.35	1.22	unconfined		0.72
S-430	1/31/2020	12.44	12.89	0.45	0.52	unconfined		0.72
S-430	2/3/2020	12.34	12.47	0.13	0.71	unconfined		0.72
S-430	2/4/2020	12.31	12.62	0.31	0.69	unconfined		0.72
S-430	2/6/2020	12.31	12.62	0.31	0.69	unconfined		0.72
S-430	2/7/2020	12.30	12.62	0.32	0.70	unconfined		0.72
S-430	2/10/2020	12.40	12.69	0.29	0.61	unconfined		0.72
S-430	2/13/2020	12.41	12.74	0.33	0.59	unconfined		0.72
S-430	2/21/2020	12.30	12.98	0.68	0.60	unconfined		0.72
S-430	2/24/2020	12.43	13.16	0.73	0.46	unconfined		0.72
S-430	2/25/2020	12.29	13.03	0.74	0.59	unconfined		0.72
S-430	2/27/2020	12.49	12.83	0.34	0.51	unconfined		0.72
S-430	2/28/2020	12.53	13.03	0.50	0.42	unconfined		0.72
S-430	3/2/2020	12.66	13.08	0.42	0.31	unconfined		0.72
S-430	3/10/2020	12.68	13.15	0.47	0.28	unconfined		0.72
S-430	3/13/2020	12.58	12.95	0.37	0.41	unconfined		0.72
S-430	3/16/2020	12.63	12.97	0.34	0.37	unconfined		0.72
S-430	3/17/2020	12.52	12.78	0.26	0.50	unconfined		0.72
S-430	3/19/2020	12.55	14.43	1.88	0.02	unconfined		0.72
S-430	3/23/2020	12.65	13.08	0.43	0.32	unconfined		0.72
S-430	3/26/2020	12.47	12.76	0.29	0.54	unconfined		0.72
S-430	4/2/2020	11.95	12.19	0.24	1.07	unconfined		0.72
S-430	4/10/2020	12.16	12.43	0.27	0.85	unconfined		0.72
S-430	4/14/2020	12.23	12.50	0.27	0.78	unconfined		0.72
S-430	4/16/2020	12.11	12.32	0.21	0.92	unconfined		0.72

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S-430	4/17/2020	12.21	12.44	0.23	0.82	unconfined		0.72
S-430	4/20/2020	12.19	12.43	0.24	0.83	unconfined		0.72
S-430	4/21/2020	12.16	12.36	0.20	0.87	unconfined		0.72
S-430	4/23/2020	12.49	12.70	0.21	0.54	unconfined		0.72
S-430	4/24/2020	12.33	12.59	0.26	0.69	unconfined		0.72
S-430	4/27/2020	12.23	12.61	0.38	0.75	unconfined		0.72
S-430	4/28/2020	12.34	13.26	0.92	0.49	unconfined		0.72
S-430	4/30/2020	12.06	12.21	0.15	0.99	unconfined		0.72
S-430	5/1/2020	11.89	12.40	0.51	1.06	unconfined		0.72
S-430	5/4/2020	11.95	12.14	0.19	1.09	unconfined		0.72
S-430	5/7/2020	11.99	12.16	0.17	1.05	unconfined		0.72
S-430	5/12/2020	12.55	12.73	0.18	0.49	unconfined		0.72
S-430	5/14/2020	12.50	12.67	0.17	0.54	unconfined		0.72
S-430	5/18/2020	12.43	12.60	0.17	0.61	unconfined		0.72
S-430	5/19/2020	12.40	12.57	0.17	0.64	unconfined		0.72
S-430	5/21/2020	12.58	13.44	0.86	0.27	unconfined		0.72
S-430	5/26/2020	12.44	12.82	0.38	0.54	unconfined		0.72
S-430	5/28/2020	12.37	12.55	0.18	0.67	unconfined		0.72
S-430	6/1/2020	12.44	12.65	0.21	0.59	unconfined		0.72
S-430	6/2/2020	12.44	12.65	0.21	0.59	unconfined		0.72
S-430	6/4/2020	12.29	12.52	0.23	0.74	unconfined		0.72
S-430	6/5/2020	12.29	12.52	0.23	0.74	unconfined		0.72
S-430	6/8/2020	12.43	12.67	0.24	0.59	unconfined		0.72
S-430	6/11/2020	12.17	12.41	0.24	0.85	unconfined		0.72
S-430	6/16/2020	12.48	12.69	0.21	0.55	unconfined		0.72
S-430	6/18/2020	12.48	12.69	0.21	0.55	unconfined		0.72
S-430	6/19/2020	12.34	12.54	0.20	0.69	unconfined		0.72
S-430	6/22/2020	12.40	12.64	0.24	0.62	unconfined		0.72
S-430	6/26/2020	12.38	12.61	0.23	0.65	unconfined		0.72
S-430	7/1/2020	12.36	12.56	0.20	0.67	unconfined		0.72
S-430	7/7/2020	12.44	12.65	0.21	0.59	unconfined		0.72
S-430	7/9/2020	12.40	12.60	0.20	0.63	unconfined		0.72
S-430	7/14/2020	12.07	12.24	0.17	0.97	unconfined		0.72
S-430	7/17/2020	12.08	12.22	0.14	0.97	unconfined		0.72
S-430	7/22/2020	12.36	12.59	0.23	0.67	unconfined		0.72
S-430	7/23/2020	11.46	12.55	1.09	1.33	unconfined		0.72
S-430	7/24/2020	11.46	12.55	1.09	1.33	unconfined		0.72
S-430	7/28/2020	12.26	12.42	0.16	0.79	unconfined		0.72
S-430	7/30/2020	12.39	12.58	0.19	0.65	unconfined		0.72
S-430	8/4/2020	12.38	12.71	0.33	0.62	unconfined		0.72
S-430	8/6/2020	12.26	12.48	0.22	0.77	unconfined		0.72
S-430	8/18/2020	11.88	11.99	0.11	1.18	unconfined		0.72
S-430	8/25/2020	11.50	12.32	0.82	1.36	unconfined		0.72
S-430	8/27/2020	12.03	12.14	0.11	1.03	unconfined		0.72
S-430	9/3/2020	12.21	12.42	0.21	0.82	unconfined		0.72
S-430	9/11/2020	12.28	12.29	0.01	0.81	unconfined		0.72
S-430	9/16/2020	12.29	12.45	0.16	0.76	unconfined		0.72
S-430	9/18/2020	12.38	12.41	0.03	0.70	unconfined		0.72
S-430	9/22/2020	11.85	12.22	0.37	1.14	unconfined		0.72
S-430	9/24/2020	12.19	12.37	0.18	0.85	unconfined		0.72
S-430	10/1/2020	12.09	12.34	0.25	0.93	unconfined		0.72
S-430	10/8/2020	12.38	12.55	0.17	0.66	unconfined		0.72
S-430	10/12/2020	12.46	12.56	0.10	0.60	unconfined		0.72
S-430	10/19/2020	12.45	12.63	0.18	0.59	unconfined		0.72
S-430	10/23/2020	12.33	12.49	0.16	0.72	unconfined		0.72
S-430	10/30/2020	12.21	12.39	0.18	0.83	unconfined		0.72
S-430	11/2/2020	12.26	12.27	0.01	0.83	unconfined		0.72
S-430	11/9/2020	12.50	12.61	0.11	0.56	unconfined		0.72
S-430	11/10/2020	12.49	12.62	0.13	0.56	unconfined		0.72
S-430	11/16/2020	--	12.06	--	1.03	unconfined		0.72
S-430	11/19/2020	12.31	12.44	0.13	0.74	unconfined		0.72
S-430	11/23/2020	12.26	12.44	0.18	0.78	unconfined		0.72
S-430	11/30/2020	12.05	12.11	0.06	1.02	unconfined		0.72
S-430	12/4/2020	12.32	12.48	0.16	0.73	unconfined		0.72
S-430	12/8/2020	12.22	12.31	0.09	0.84	unconfined		0.72
S-430	12/11/2020	12.18	12.29	0.11	0.88	unconfined		0.72
S-430	12/14/2020	12.06	12.12	0.06	1.01	unconfined		0.72

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-430	12/18/2020	12.10	12.19	0.09	0.96	unconfined		0.72
S-430	12/21/2020	12.12	12.24	0.12	0.94	unconfined		0.72
S-430	12/28/2020	11.64	11.72	0.08	1.43	unconfined		0.72
S-430	12/31/2020	11.87	11.93	0.06	1.20	unconfined		0.72
S-430	1/4/2021	11.63	11.79	0.16	1.42	unconfined		0.72
S-430	1/8/2021	11.61	11.73	0.12	1.45	unconfined		0.72
S-430	1/15/2021	11.89	11.94	0.05	1.19	unconfined		0.72
S-430	1/25/2021	12.29	12.34	0.05	0.79	unconfined		0.72
S-430	1/29/2021	12.40	12.46	0.06	0.67	unconfined		0.72
S-430	2/4/2021	12.34	12.46	0.12	0.72	unconfined		0.72
S-430	2/9/2021	12.21	12.27	0.06	0.86	unconfined		0.72
S-430	2/19/2021	12.24	12.31	0.07	0.83	unconfined		0.72
S-430	2/23/2021	12.06	12.09	0.03	1.02	unconfined		0.72
S-430	2/26/2021	12.12	12.16	0.04	0.96	unconfined		0.72
S-430	3/1/2021	11.78	11.84	0.06	1.29	unconfined		0.72
S-430	3/5/2021	12.02	12.07	0.05	1.06	unconfined		0.72
S-430	3/8/2021	12.07	12.10	0.03	1.01	unconfined		0.72
S-430	3/12/2021	11.78	12.00	0.22	1.25	unconfined		0.72
S-430	3/15/2021	12.37	12.45	0.08	0.70	unconfined		0.72
S-430	3/25/2021	11.85	11.89	0.04	1.23	unconfined		0.72
S-430	3/29/2021	11.94	11.97	0.03	1.14	unconfined		0.72
S-430	4/1/2021	11.85	11.91	0.06	1.22	unconfined		0.72
S-430	4/7/2021	11.73	11.75	0.02	1.35	unconfined		0.72
S-430	4/9/2021	12.71	12.73	0.02	0.37	unconfined		0.72
S-430	4/11/2021	11.72	11.73	0.01	1.37	unconfined		0.72
S-430	4/13/2021	11.68	11.69	0.01	1.41	unconfined		0.72
S-430	4/20/2021	--	11.74	--	1.35	unconfined		0.72
S-430	4/23/2021	--	12.02	--	1.07	unconfined		0.72
S-430	5/3/2021	--	12.03	--	1.06	unconfined		0.72
S-430	5/6/2021	--	12.08	--	1.01	unconfined		0.72
S-430	5/11/2021	--	12.31	--	0.78	unconfined		0.72
S-430	5/14/2021	--	12.39	--	0.70	unconfined		0.72
S-430	5/20/2021	--	12.34	--	0.75	unconfined		0.72
S-430	5/25/2021	--	12.24	--	0.85	unconfined		0.72
S-430	6/3/2021	--	12.05	--	1.04	unconfined		0.72
S-430	6/4/2021	--	12.01	--	1.08	unconfined		0.72
S-430	6/14/2021	--	11.86	--	1.23	unconfined		0.72
S-430	6/18/2021	--	11.71	--	1.38	unconfined		0.72
S-430	6/22/2021	11.69	11.70	0.01	1.40	unconfined		0.72
S-430	6/23/2021	--	11.71	--	1.38	unconfined		0.72
S-430	6/24/2021	--	11.71	--	1.38	unconfined		0.72
S-430	6/24/2021	--	11.71	--	1.38	unconfined		0.72
S-430	6/29/2021	--	11.71	--	1.38	unconfined		0.72
S-430	7/1/2021	--	13.22	--	-0.13	unconfined		0.72
S-430	7/6/2021	--	11.90	--	1.19	unconfined		0.72
S-430	7/9/2021	--	12.12	--	0.97	unconfined		0.72
S-430	7/13/2021	11.97	11.98	0.01	1.12	unconfined		0.72
S-430	7/20/2021	--	11.68	--	1.41	unconfined		0.72
S-430	7/23/2021	--	11.84	--	1.25	unconfined		0.72
S-430	7/27/2021	--	11.92	--	1.17	unconfined		0.72
S-430	7/30/2021	--	11.73	--	1.36	unconfined		0.72
S-430	8/10/2021	--	12.15	--	0.94	unconfined		0.72
S-430	8/13/2021	--	12.13	--	0.96	unconfined		0.72
S-430	8/24/2021	--	11.94	--	1.15	unconfined		0.72
S-430	8/27/2021	--	11.85	--	1.24	unconfined		0.72
S-430	9/3/2021	--	11.16	--	1.93	unconfined		0.72
S-430	9/10/2021	--	11.50	--	1.59	unconfined		0.72
S-430	9/16/2021	--	11.66	--	1.43	unconfined		0.72
S-430	9/22/2021	--	11.77	--	1.32	unconfined		0.72
S-430	9/24/2021	--	11.53	--	1.56	unconfined		0.72
S-430	9/29/2021	--	11.68	--	1.41	unconfined		0.72
S-430	10/5/2021	--	11.93	--	1.16	unconfined		0.72
S-430	10/14/2021	--	11.58	--	1.51	unconfined		0.72
S-430	10/21/2021	--	12.03	--	1.06	unconfined		0.72
S-430	10/28/2021	--	11.68	--	1.41	unconfined		0.72
S-430	11/4/2021	--	11.77	--	1.32	unconfined		0.72
S-430	11/11/2021	--	11.73	--	1.36	unconfined		0.72

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-430	11/18/2021	--	12.06	--	1.03	unconfined		0.72
S-430	11/24/2021	--	12.40	--	0.69	unconfined		0.72
S-430	12/22/2021	--	12.75	--	0.34	unconfined		0.72
S-430	12/30/2021	--	12.44	--	0.65	unconfined		0.72
S-430	1/4/2022	--	12.61	--	0.48	unconfined		0.72
S-430	1/12/2022	--	12.74	--	0.35	unconfined		0.72
S-430	1/25/2022	--	12.67	--	0.42	unconfined		0.72
S-430	2/8/2022	--	12.71	--	0.38	unconfined		0.72
S-430	2/14/2022	--	12.90	--	0.19	unconfined		0.72
S-430	2/24/2022	--	12.96	--	0.13	unconfined		0.72
S-430	2/28/2022	--	13.98	--	-0.89	unconfined		0.72
S-430	3/17/2022	--	13.06	--	0.03	unconfined		0.72
S-430	4/8/2022	--	12.92	--	0.17	unconfined		0.72
S-430	4/20/2022	--	12.13	--	0.96	unconfined		0.72
S-430	4/25/2022	--	12.08	--	1.01	unconfined		0.72
S-430	5/2/2022	--	12.36	--	0.73	unconfined		0.72
S-430	5/9/2022	--	11.83	--	1.26	unconfined		0.72
S-430	5/26/2022	--	12.08	--	1.01	unconfined		0.72
S-430	6/15/2022	--	11.88	--	1.21	unconfined		0.72
S-430	7/14/2022	--	12.35	--	0.74	unconfined		0.72
S-430	7/18/2022	--	12.26	--	0.83	unconfined		0.72
S-430	7/26/2022	--	12.49	--	0.60	unconfined		0.72
S-430	8/1/2022	--	12.59	--	0.50	unconfined		0.72
S-430	8/9/2022	--	12.71	--	0.38	unconfined		0.72
S-430	8/24/2022	--	12.66	--	0.43	unconfined		0.72
S-430	8/29/2022	--	12.71	--	0.38	unconfined		0.72
S-430	9/8/2022	--	12.50	--	0.59	unconfined		0.72
S-430	9/22/2022	--	12.53	--	0.56	unconfined		0.72
S-430	9/28/2022	--	12.89	--	0.20	unconfined		0.72
S-430	10/13/2022	--	12.43	--	0.66	unconfined		0.72
S-430	10/20/2022	--	12.44	--	0.65	unconfined		0.72
S-430	10/27/2022	--	12.59	--	0.50	unconfined		0.72
S-430	11/1/2022	--	12.51	--	0.58	unconfined		0.72
S-430	11/10/2022	--	12.79	--	0.30	unconfined		0.72
S-430	11/16/2022	--	12.68	--	0.41	unconfined		0.72
S-430	11/22/2022	--	12.94	--	0.15	unconfined		0.72
S-430	11/30/2022	--	12.73	--	0.36	unconfined		0.72
S-430	12/14/2022	--	11.63	--	1.46	unconfined		0.72
S-430	12/28/2022	--	11.35	--	1.74	unconfined		0.72
S-430	1/3/2023	--	11.26	--	1.83	unconfined		0.72
S-430	1/10/2023	--	11.34	--	1.75	unconfined		0.72
S-430	1/19/2023	--	11.23	--	1.86	unconfined		0.72
S-430	1/26/2023	--	11.35	--	1.74	unconfined		0.72
S-430	1/31/2023	--	11.69	--	1.40	unconfined		0.72
S-430	2/7/2023	--	12.36	--	0.73	unconfined		0.72
S-430	2/16/2023	--	12.22	--	0.87	unconfined		0.72
S-430	2/28/2023	--	12.21	--	0.88	unconfined		0.72
S-430	3/7/2023	--	12.17	--	0.92	unconfined		0.72
S-430	3/16/2023	--	12.35	--	0.74	unconfined		0.72
S-430	3/23/2023	--	12.60	--	0.49	unconfined		0.72
S-430	3/29/2023	--	12.49	--	0.60	unconfined		0.72
S-430	4/5/2023	--	12.72	--	0.37	unconfined		0.72
S-430	4/13/2023	--	12.69	--	0.40	unconfined		0.72
S-430	4/19/2023	--	12.58	--	0.51	unconfined		0.72
S-430	4/26/2023	--	12.65	--	0.44	unconfined		0.72
S-430	5/3/2023	--	11.87	--	1.22	unconfined		0.72
S-430	5/10/2023	--	12.10	--	0.99	unconfined		0.72
S-430	5/16/2023	--	12.31	--	0.78	unconfined		0.72
S-430	5/23/2023	--	12.45	--	0.64	unconfined		0.72
S-430	5/31/2023	--	12.46	--	0.63	unconfined		0.72
S-430	6/7/2023	--	12.46	--	0.63	unconfined		0.72
S-430	6/20/2023	--	12.60	--	0.49	unconfined		0.72
S-430	6/27/2023	--	12.30	--	0.79	unconfined		0.72
S-430	7/19/2023	--	11.68	--	1.41	unconfined		0.72
S-430	7/26/2023	--	11.52	--	1.57	unconfined		0.72
S-430	8/2/2023	--	11.73	--	1.36	unconfined		0.72
S-430	8/9/2023	--	11.55	--	1.54	unconfined		0.72

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-430	9/5/2023	--	11.93	--	1.16	unconfined		0.72
S-430	9/15/2023	--	12.12	--	0.97	unconfined		0.72
S-430	9/20/2023	--	12.05	--	1.04	unconfined		0.72
S-430	9/27/2023	--	11.15	--	1.94	unconfined		0.72
S-430	10/4/2023	--	11.41	--	1.68	unconfined		0.72
S-430	10/17/2023	--	11.73	--	1.36	unconfined		0.72
S-430	10/26/2023	--	12.05	--	1.04	unconfined		0.72
S-430	11/1/2023	--	12.01	--	1.08	unconfined		0.72
S-430	11/9/2023	--	11.98	--	1.11	unconfined		0.72
S-430	11/13/2023	--	12.25	--	0.84	unconfined		0.72
S-430	11/22/2023	--	11.98	--	1.11	unconfined		0.72
S-430	11/29/2023	--	12.34	--	0.75	unconfined		0.72
S-430	12/14/2023	--	11.93	--	1.16	unconfined		0.72
S-430	12/20/2023	--	10.47	--	2.62	unconfined		0.72
S-430	1/3/2024	--	10.82	--	2.27	unconfined		0.72
S-430	1/11/2024	--	10.20	--	2.89	unconfined		0.72
S-430	1/18/2024	--	10.54	--	2.55	unconfined		0.72
S-430	1/24/2024	--	11.25	--	1.84	unconfined		0.72
S-430	1/30/2024	--	10.71	--	2.38	unconfined		0.72
S-430	2/5/2024	--	10.63	--	2.46	unconfined		0.72
S-430	2/15/2024	--	11.39	--	1.70	unconfined		0.72
S-430	2/21/2024	--	11.51	--	1.58	unconfined		0.72
S-430	2/28/2024	--	11.65	--	1.44	unconfined		0.72
S-430	3/5/2024	--	11.48	--	1.61	unconfined		0.72
S-430	3/20/2024	--	11.10	--	1.99	unconfined		0.72
S-430	3/28/2024	--	10.63	--	2.46	unconfined		0.72
S-430	4/3/2024	--	10.26	--	2.83	unconfined		0.72
S-430	4/9/2024	--	10.13	--	2.96	unconfined		0.72
S-430	4/25/2024	--	10.90	--	2.19	unconfined		0.72
S-430	4/30/2024	--	10.82	--	2.27	unconfined		0.72
S-430	5/8/2024	--	11.10	--	1.99	unconfined		0.72
S-430	5/20/2024	--	11.21	--	1.88	unconfined		0.72
S-430	5/31/2024	--	11.45	--	1.64	unconfined		0.72
S-430	6/5/2024	--	11.64	--	1.45	unconfined		0.72
S-430	6/12/2024	--	11.55	--	1.54	unconfined		0.72
S-430	6/19/2024	--	11.73	--	1.36	unconfined		0.72
S-430	6/26/2024	--	11.83	--	1.26	unconfined		0.72
S-430	7/2/2024	--	11.60	--	1.49	unconfined		0.72
S-430	7/10/2024	--	11.39	--	1.70	unconfined		0.72
S-430	7/16/2024	--	11.60	--	1.49	unconfined		0.72
S-430	7/24/2024	--	11.69	--	1.40	unconfined		0.72
S-430	8/1/2024	--	11.96	--	1.13	unconfined		0.72
S-430	8/6/2024	--	12.06	--	1.03	unconfined		0.72
S-430	8/23/2024	--	11.12	--	1.97	unconfined		0.72
S-430	8/28/2024	--	11.29	--	1.80	unconfined		0.72
S-430	9/4/2024	--	11.60	--	1.49	unconfined		0.72
S-430	9/11/2024	--	11.73	--	1.36	unconfined		0.72
S-430	9/18/2024	--	11.90	--	1.19	unconfined		0.72
S-430	9/25/2024	--	11.45	--	1.64	unconfined		0.72
S-430	10/1/2024	--	11.78	--	1.31	unconfined		0.72
S-430	10/14/2024	--	12.20	--	0.89	unconfined		0.72
S-430	10/28/2024	--	12.55	--	0.54	unconfined		0.72
S-430	11/8/2024	--	12.89	--	0.20	unconfined		0.72
S-430	11/15/2024	--	12.65	--	0.44	unconfined		0.72
S-430	11/20/2024	--	12.85	--	0.24	unconfined		0.72
S-430	11/26/2024	--	12.85	--	0.24	unconfined		0.72
S-430	12/4/2024	--	13.00	--	0.09	unconfined		0.72
S-430	12/11/2024	--	12.84	--	0.25	unconfined		0.72
S-430	12/17/2024	--	12.80	--	0.29	unconfined		0.72
S-430	1/8/2025	--	12.74	--	0.35	unconfined		0.72
S-430	1/16/2025	--	12.88	--	0.21	unconfined		0.72
S-430	1/24/2025	--	13.45	--	-0.36	unconfined		0.72
S-430	1/29/2025	--	13.21	--	-0.12	unconfined		0.72
S-430	2/5/2025	--	13.15	--	-0.06	unconfined		0.72
S-430	2/12/2025	--	13.05	--	0.04	unconfined		0.72
S-430	2/20/2025	--	13.12	--	-0.03	unconfined		0.72
S-431	9/28/2018	--	14.36	--	3.16	unconfined		0.72

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-431	10/1/2018	--	15.12	--	2.40	unconfined		0.72
S-431	10/3/2018	--	16.15	--	1.37	unconfined		0.72
S-431	10/4/2018	--	16.15	--	1.37	unconfined		0.72
S-431	10/5/2018	15.94	16.23	0.29	1.50	unconfined		0.72
S-431	10/8/2018	--	16.28	--	1.24	unconfined		0.72
S-431	10/9/2018	--	16.29	--	1.23	unconfined		0.72
S-431	10/10/2018	16.29	16.29	<0.01	1.23	unconfined		0.72
S-431	10/10/2018	15.97	17.93	1.96	1.00	unconfined		0.72
S-431	10/16/2018	16.45	16.46	0.01	1.07	unconfined		0.72
S-431	10/16/2018	16.44	16.45	0.01	1.08	unconfined		0.72
S-431	10/22/2018	16.50	17.38	0.88	0.78	unconfined		0.72
S-431	10/26/2018	17.97	19.48	1.51	-0.87	unconfined		0.72
S-431	11/6/2018	15.97	17.93	1.96	1.00	unconfined		0.72
S-431	11/13/2018	15.68	17.48	1.80	1.34	unconfined		0.72
S-431	11/13/2018	15.68	17.48	1.80	1.34	unconfined		0.72
S-431	11/14/2018	15.81	16.50	0.69	1.52	unconfined		0.72
S-431	11/20/2018	15.50	17.09	1.59	1.58	unconfined		0.72
S-431	12/3/2018	15.37	16.58	1.21	1.81	unconfined		0.72
S-431	12/5/2018	16.58	17.61	1.03	0.65	unconfined		0.72
S-431	12/6/2018	15.57	17.79	2.22	1.33	unconfined		0.72
S-431	12/11/2018	15.80	16.94	1.14	1.40	unconfined		0.72
S-431	12/13/2018	16.04	16.91	0.87	1.24	unconfined		0.72
S-431	12/20/2018	16.00	16.65	0.65	1.34	unconfined		0.72
S-431	12/27/2018	15.84	17.19	1.35	1.30	unconfined		0.72
S-431	1/4/2019	15.36	16.64	1.28	1.80	unconfined		0.72
S-431	1/9/2019	15.39	16.78	1.39	1.74	unconfined		0.72
S-431	1/11/2019	15.70	17.41	1.71	1.34	unconfined		0.72
S-431	1/14/2019	15.89	17.14	1.25	1.28	unconfined		0.72
S-431	1/23/2019	16.19	17.38	1.19	1.00	unconfined		0.72
S-431	1/30/2019	15.75	16.85	1.10	1.46	unconfined		0.72
S-431	2/1/2019	16.04	17.20	1.16	1.16	unconfined		0.72
S-431	2/6/2019	16.11	17.29	1.18	1.08	unconfined		0.72
S-431	2/7/2019	16.21	17.00	0.79	1.09	unconfined		0.72
S-431	2/11/2019	16.34	17.38	1.04	0.89	unconfined		0.72
S-431	2/13/2019	16.09	17.22	1.13	1.12	unconfined		0.72
S-431	2/15/2019	15.98	16.97	0.99	1.26	unconfined		0.72
S-431	2/18/2019	15.89	16.97	1.08	1.33	unconfined		0.72
S-431	2/22/2019	17.96	18.97	1.01	-0.72	unconfined		0.72
S-431	2/25/2019	16.01	16.91	0.90	1.26	unconfined		0.72
S-431	3/1/2019	16.16	16.85	0.69	1.17	unconfined		0.72
S-431	3/4/2019	15.97	16.51	0.54	1.40	unconfined		0.72
S-431	3/12/2019	16.05	16.44	0.39	1.36	unconfined		0.72
S-431	3/13/2019	16.42	16.73	0.31	1.01	unconfined		0.72
S-431	3/13/2019	16.11	16.42	0.31	1.32	unconfined		0.72
S-431	3/18/2019	16.21	16.51	0.30	1.23	unconfined		0.72
S-431	3/22/2019	16.15	16.41	0.26	1.30	unconfined		0.72
S-431	3/25/2019	16.39	16.64	0.25	1.06	unconfined		0.72
S-431	3/29/2019	16.32	16.53	0.21	1.14	unconfined		0.72
S-431	4/2/2019	16.45	16.71	0.26	1.00	unconfined		0.72
S-431	4/5/2019	16.61	16.86	0.25	0.84	unconfined		0.72
S-431	4/8/2019	16.54	16.91	0.37	0.88	unconfined		0.72
S-431	4/12/2019	16.43	16.96	0.53	0.94	unconfined		0.72
S-431	4/15/2019	16.30	16.92	0.62	1.05	unconfined		0.72
S-431	4/19/2019	16.39	17.05	0.66	0.95	unconfined		0.72
S-431	4/24/2019	16.29	16.92	0.63	1.05	unconfined		0.72
S-431	4/26/2019	16.27	16.86	0.59	1.09	unconfined		0.72
S-431	4/29/2019	16.42	16.90	0.48	0.97	unconfined		0.72
S-431	5/3/2019	16.46	16.84	0.38	0.95	unconfined		0.72
S-431	5/10/2019	16.21	16.78	0.57	1.15	unconfined		0.72
S-431	5/15/2019	15.79	16.26	0.47	1.60	unconfined		0.72
S-431	5/17/2019	15.71	16.12	0.41	1.70	unconfined		0.72
S-431	5/20/2019	15.82	16.22	0.40	1.59	unconfined		0.72
S-431	5/24/2019	16.15	16.54	0.39	1.26	unconfined		0.72
S-431	5/28/2019	16.19	16.50	0.31	1.24	unconfined		0.72
S-431	5/31/2019	16.19	16.47	0.28	1.25	unconfined		0.72
S-431	6/10/2019	16.41	16.73	0.32	1.02	unconfined		0.72
S-431	6/14/2019	16.30	16.59	0.29	1.14	unconfined		0.72

Table 3-2
Well Gauging Summary, 2018 to Present
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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-431	6/17/2019	16.35	16.61	0.26	1.10	unconfined		0.72
S-431	6/18/2019	16.54	16.75	0.21	0.92	unconfined		0.72
S-431	6/26/2019	15.73	15.98	0.25	1.72	unconfined		0.72
S-431	6/28/2019	15.90	16.11	0.21	1.56	unconfined		0.72
S-431	7/1/2019	16.00	16.08	0.08	1.50	unconfined		0.72
S-431	7/3/2019	16.09	16.16	0.07	1.41	unconfined		0.72
S-431	7/8/2019	15.89	16.09	0.20	1.57	unconfined		0.72
S-431	7/15/2019	15.80	15.96	0.16	1.68	unconfined		0.72
S-431	7/22/2019	16.10	16.21	0.11	1.39	unconfined		0.72
S-431	7/29/2019	16.08	16.28	0.20	1.38	unconfined		0.72
S-431	8/2/2019	16.40	16.60	0.20	1.06	unconfined		0.72
S-431	8/2/2019	16.20	16.40	0.20	1.26	unconfined		0.72
S-431	8/12/2019	16.13	16.30	0.17	1.34	unconfined		0.72
S-431	8/16/2019	15.25	15.46	0.21	2.21	unconfined		0.72
S-431	8/19/2019	16.25	16.48	0.23	1.21	unconfined		0.72
S-431	8/23/2019	16.36	16.57	0.21	1.10	unconfined		0.72
S-431	9/6/2019	16.52	16.74	0.22	0.94	unconfined		0.72
S-431	10/18/2019	16.93	17.88	0.95	0.33	unconfined		0.72
S-431	11/14/2019	16.98	17.93	0.95	0.28	unconfined		0.72
S-431	11/22/2019	16.92	17.95	1.03	0.31	unconfined		0.72
S-431	12/6/2019	18.09	19.08	0.99	-0.85	unconfined		0.72
S-431	12/10/2019	17.05	18.02	0.97	0.20	unconfined		0.72
S-431	12/16/2019	17.01	17.95	0.94	0.25	unconfined		0.72
S-431	12/30/2019	16.85	17.76	0.91	0.42	unconfined		0.72
S-431	1/2/2020	16.78	17.71	0.93	0.48	unconfined		0.72
S-431	1/6/2020	16.81	17.58	0.77	0.50	unconfined		0.72
S-431	1/9/2020	16.98	17.72	0.74	0.33	unconfined		0.72
S-431	1/13/2020	17.10	17.89	0.79	0.20	unconfined		0.72
S-431	1/17/2020	17.17	18.04	0.87	0.11	unconfined		0.72
S-431	1/21/2020	17.95	18.94	0.99	-0.71	unconfined		0.72
S-431	1/23/2020	17.12	17.96	0.84	0.17	unconfined		0.72
S-431	1/27/2020	16.73	17.71	0.98	0.52	unconfined		0.72
S-431	1/28/2020	16.78	17.79	1.01	0.46	unconfined		0.72
S-431	1/30/2020	16.82	17.66	0.84	0.47	unconfined		0.72
S-431	1/31/2020	16.79	17.61	0.82	0.50	unconfined		0.72
S-431	2/3/2020	16.52	17.61	1.09	0.70	unconfined		0.72
S-431	2/4/2020	16.73	17.54	0.81	0.56	unconfined		0.72
S-431	2/6/2020	16.73	17.54	0.81	0.56	unconfined		0.72
S-431	2/7/2020	16.70	17.52	0.82	0.59	unconfined		0.72
S-431	2/10/2020	16.75	17.57	0.82	0.54	unconfined		0.72
S-431	2/13/2020	16.75	17.56	0.81	0.54	unconfined		0.72
S-431	2/21/2020	16.75	17.66	0.91	0.52	unconfined		0.72
S-431	2/24/2020	16.93	17.77	0.84	0.36	unconfined		0.72
S-431	2/25/2020	16.93	17.72	0.79	0.37	unconfined		0.72
S-431	2/27/2020	16.93	17.69	0.76	0.38	unconfined		0.72
S-431	2/28/2020	16.52	17.68	1.16	0.68	unconfined		0.72
S-431	3/2/2020	17.05	17.84	0.79	0.25	unconfined		0.72
S-431	3/10/2020	17.01	17.85	0.84	0.28	unconfined		0.72
S-431	3/13/2020	16.95	17.78	0.83	0.34	unconfined		0.72
S-431	3/16/2020	17.71	18.43	0.72	-0.39	unconfined		0.72
S-431	3/17/2020	16.95	17.73	0.78	0.35	unconfined		0.72
S-431	3/19/2020	17.02	18.31	1.29	0.14	unconfined		0.72
S-431	3/23/2020	16.98	17.75	0.77	0.33	unconfined		0.72
S-431	3/24/2020	16.98	17.75	0.77	0.33	unconfined		0.72
S-431	3/26/2020	16.83	17.64	0.81	0.46	unconfined		0.72
S-431	4/2/2020	16.29	17.34	1.05	0.94	unconfined		0.72
S-431	4/10/2020	16.43	17.35	0.92	0.83	unconfined		0.72
S-431	4/14/2020	16.60	17.25	0.65	0.74	unconfined		0.72
S-431	4/16/2020	16.52	17.22	0.70	0.81	unconfined		0.72
S-431	4/17/2020	16.70	17.42	0.72	0.62	unconfined		0.72
S-431	4/20/2020	16.55	17.23	0.68	0.78	unconfined		0.72
S-431	4/21/2020	16.51	17.22	0.71	0.81	unconfined		0.72
S-431	4/23/2020	16.78	17.34	0.56	0.58	unconfined		0.72
S-431	4/24/2020	16.73	17.33	0.60	0.62	unconfined		0.72
S-431	4/27/2020	16.62	17.33	0.71	0.70	unconfined		0.72
S-431	4/28/2020	16.68	17.32	0.64	0.66	unconfined		0.72
S-431	4/30/2020	16.49	17.23	0.74	0.82	unconfined		0.72

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-431	5/1/2020	16.31	17.17	0.86	0.97	unconfined		0.72
S-431	5/4/2020	16.35	17.23	0.88	0.93	unconfined		0.72
S-431	5/7/2020	16.41	17.17	0.76	0.90	unconfined		0.72
S-431	5/12/2020	16.92	17.32	0.40	0.49	unconfined		0.72
S-431	5/14/2020	16.95	17.24	0.29	0.49	unconfined		0.72
S-431	5/18/2020	16.94	17.34	0.40	0.47	unconfined		0.72
S-431	5/19/2020	16.92	17.38	0.46	0.47	unconfined		0.72
S-431	5/21/2020	16.98	17.92	0.94	0.28	unconfined		0.72
S-431	5/26/2020	16.83	17.51	0.68	0.50	unconfined		0.72
S-431	5/28/2020	16.83	17.45	0.62	0.52	unconfined		0.72
S-431	6/1/2020	16.91	17.43	0.52	0.47	unconfined		0.72
S-431	6/2/2020	16.91	17.43	0.52	0.47	unconfined		0.72
S-431	6/4/2020	16.79	17.43	0.64	0.55	unconfined		0.72
S-431	6/5/2020	16.79	17.43	0.64	0.55	unconfined		0.72
S-431	6/8/2020	16.74	17.52	0.78	0.56	unconfined		0.72
S-431	6/11/2020	16.65	17.41	0.76	0.66	unconfined		0.72
S-431	6/16/2020	16.83	17.44	0.61	0.52	unconfined		0.72
S-431	6/18/2020	16.83	17.44	0.61	0.52	unconfined		0.72
S-431	6/19/2020	16.78	17.36	0.58	0.58	unconfined		0.72
S-431	6/22/2020	16.76	17.33	0.57	0.60	unconfined		0.72
S-431	6/26/2020	16.83	17.44	0.61	0.52	unconfined		0.72
S-431	7/1/2020	16.85	17.34	0.49	0.53	unconfined		0.72
S-431	7/7/2020	16.88	17.51	0.63	0.46	unconfined		0.72
S-431	7/9/2020	16.65	17.81	1.16	0.55	unconfined		0.72
S-431	7/14/2020	16.42	17.44	1.02	0.82	unconfined		0.72
S-431	7/17/2020	17.00	17.89	0.89	0.27	unconfined		0.72
S-431	7/22/2020	16.57	17.34	0.77	0.74	unconfined		0.72
S-431	7/23/2020	17.72	18.78	1.06	-0.49	unconfined		0.72
S-431	7/24/2020	16.66	17.72	1.06	0.57	unconfined		0.72
S-431	7/28/2020	16.71	17.21	0.50	0.67	unconfined		0.72
S-431	7/30/2020	16.86	17.23	0.37	0.56	unconfined		0.72
S-431	8/4/2020	16.68	17.25	0.57	0.68	unconfined		0.72
S-431	8/6/2020	16.71	17.21	0.50	0.67	unconfined		0.72
S-431	8/7/2020	17.31	18.45	1.14	-0.11	unconfined		0.72
S-431	8/18/2020	16.08	17.21	1.13	1.13	unconfined		0.72
S-431	8/25/2020	16.61	17.34	0.73	0.71	unconfined		0.72
S-431	8/27/2020	16.44	17.12	0.68	0.89	unconfined		0.72
S-431	9/3/2020	16.59	17.19	0.60	0.76	unconfined		0.72
S-431	9/11/2020	16.78	16.98	0.20	0.68	unconfined		0.72
S-431	9/16/2020	16.78	17.16	0.38	0.63	unconfined		0.72
S-431	9/18/2020	16.81	17.25	0.44	0.59	unconfined		0.72
S-431	9/22/2020	16.87	16.89	0.02	0.64	unconfined		0.72
S-431	9/24/2020	16.74	17.19	0.45	0.65	unconfined		0.72
S-431	10/1/2020	16.66	16.71	0.05	0.85	unconfined		0.72
S-431	10/8/2020	16.71	17.28	0.57	0.65	unconfined		0.72
S-431	10/12/2020	16.96	17.25	0.29	0.48	unconfined		0.72
S-431	10/19/2020	16.80	17.43	0.63	0.54	unconfined		0.72
S-431	10/23/2020	16.75	17.31	0.56	0.61	unconfined		0.72
S-431	10/30/2020	16.74	17.23	0.49	0.64	unconfined		0.72
S-431	11/2/2020	16.54	16.55	0.01	0.98	unconfined		0.72
S-431	11/9/2020	16.71	17.20	0.49	0.67	unconfined		0.72
S-431	11/10/2020	16.83	17.30	0.47	0.56	unconfined		0.72
S-431	11/19/2020	16.58	17.23	0.65	0.76	unconfined		0.72
S-431	11/23/2020	16.61	17.18	0.57	0.75	unconfined		0.72
S-431	11/30/2020	16.51	17.12	0.61	0.84	unconfined		0.72
S-431	12/4/2020	16.54	17.20	0.66	0.80	unconfined		0.72
S-431	12/8/2020	16.49	17.71	1.22	0.69	unconfined		0.72
S-431	12/11/2020	16.53	17.04	0.51	0.85	unconfined		0.72
S-431	12/14/2020	16.44	17.06	0.62	0.91	unconfined		0.72
S-431	12/18/2020	16.50	17.08	0.58	0.86	unconfined		0.72
S-431	12/21/2020	16.38	17.04	0.66	0.96	unconfined		0.72
S-431	12/28/2020	15.85	16.76	0.91	1.42	unconfined		0.72
S-431	12/31/2020	15.96	16.13	0.17	1.51	unconfined		0.72
S-431	1/4/2021	15.83	16.90	1.07	1.39	unconfined		0.72
S-431	1/8/2021	15.68	16.79	1.11	1.53	unconfined		0.72
S-431	1/15/2021	16.00	17.10	1.10	1.21	unconfined		0.72
S-431	1/25/2021	16.57	17.11	0.54	0.80	unconfined		0.72

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-431	1/29/2021	16.72	17.13	0.41	0.69	unconfined		0.72
S-431	2/4/2021	16.64	17.08	0.44	0.76	unconfined		0.72
S-431	2/9/2021	16.34	16.76	0.42	1.06	unconfined		0.72
S-431	2/19/2021	15.45	16.88	1.43	1.67	unconfined		0.72
S-431	2/23/2021	16.32	16.78	0.46	1.07	unconfined		0.72
S-431	2/26/2021	16.33	16.79	0.46	1.06	unconfined		0.72
S-431	3/1/2021	16.03	16.57	0.54	1.34	unconfined		0.72
S-431	3/5/2021	16.13	16.60	0.47	1.26	unconfined		0.72
S-431	3/8/2021	16.36	16.73	0.37	1.06	unconfined		0.72
S-431	3/12/2021	16.27	16.73	0.46	1.12	unconfined		0.72
S-431	3/15/2021	16.50	16.96	0.46	0.89	unconfined		0.72
S-431	3/19/2021	16.40	16.88	0.48	0.99	unconfined		0.72
S-431	3/25/2021	16.69	17.19	0.50	0.69	unconfined		0.72
S-431	3/29/2021	16.12	16.61	0.49	1.26	unconfined		0.72
S-431	4/1/2021	16.06	16.53	0.47	1.33	unconfined		0.72
S-431	4/7/2021	16.52	17.00	0.48	0.87	unconfined		0.72
S-431	4/9/2021	16.06	16.51	0.45	1.33	unconfined		0.72
S-431	4/11/2021	15.98	16.43	0.45	1.41	unconfined		0.72
S-431	4/13/2021	15.95	16.37	0.42	1.45	unconfined		0.72
S-431	4/20/2021	16.04	16.37	0.33	1.39	unconfined		0.72
S-431	4/23/2021	16.25	16.58	0.33	1.18	unconfined		0.72
S-431	5/3/2021	16.28	16.64	0.36	1.14	unconfined		0.72
S-431	5/6/2021	16.48	16.69	0.21	0.98	unconfined		0.72
S-431	5/11/2021	16.48	16.82	0.34	0.95	unconfined		0.72
S-431	5/14/2021	16.56	16.93	0.37	0.86	unconfined		0.72
S-431	5/20/2021	16.65	16.94	0.29	0.79	unconfined		0.72
S-431	5/25/2021	16.61	16.89	0.28	0.83	unconfined		0.72
S-431	6/3/2021	16.49	16.71	0.22	0.97	unconfined		0.72
S-431	6/4/2021	16.25	16.46	0.21	1.21	unconfined		0.72
S-431	6/14/2021	16.37	16.61	0.24	1.08	unconfined		0.72
S-431	6/18/2021	15.84	16.13	0.29	1.60	unconfined		0.72
S-431	6/22/2021	15.94	16.15	0.21	1.52	unconfined		0.72
S-431	6/23/2021	15.84	16.13	0.29	1.60	unconfined		0.72
S-431	6/24/2021	16.23	16.36	0.13	1.25	unconfined		0.72
S-431	6/29/2021	16.23	16.36	0.13	1.25	unconfined		0.72
S-431	6/30/2021	16.52	16.71	0.19	0.95	unconfined		0.72
S-431	7/1/2021	16.42	16.54	0.12	1.07	unconfined		0.72
S-431	7/6/2021	16.16	16.32	0.16	1.32	unconfined		0.72
S-431	7/9/2021	16.31	16.41	0.10	1.18	unconfined		0.72
S-431	7/13/2021	16.16	16.35	0.19	1.31	unconfined		0.72
S-431	7/20/2021	15.84	16.09	0.25	1.61	unconfined		0.72
S-431	7/23/2021	15.95	16.23	0.28	1.49	unconfined		0.72
S-431	7/27/2021	16.11	16.28	0.17	1.36	unconfined		0.72
S-431	7/30/2021	16.11	16.23	0.12	1.38	unconfined		0.72
S-431	8/3/2021	16.35	16.45	0.10	1.14	unconfined		0.72
S-431	8/10/2021	16.50	16.55	0.05	1.01	unconfined		0.72
S-431	8/12/2021	16.50	16.58	0.08	1.00	unconfined		0.72
S-431	8/13/2021	15.50	15.54	0.04	2.01	unconfined		0.72
S-431	8/20/2021	16.45	16.51	0.06	1.05	unconfined		0.72
S-431	8/24/2021	16.21	16.30	0.09	1.28	unconfined		0.72
S-431	8/27/2021	16.27	16.34	0.07	1.23	unconfined		0.72
S-431	9/3/2021	15.56	15.74	0.18	1.91	unconfined		0.72
S-431	9/10/2021	15.75	15.94	0.19	1.72	unconfined		0.72
S-431	9/16/2021	15.99	16.15	0.16	1.49	unconfined		0.72
S-431	9/22/2021	16.05	16.21	0.16	1.43	unconfined		0.72
S-431	9/23/2021	16.00	16.13	0.13	1.48	unconfined		0.72
S-431	9/24/2021	15.79	15.97	0.18	1.68	unconfined		0.72
S-431	9/29/2021	15.96	16.91	0.95	1.30	unconfined		0.72
S-431	10/5/2021	16.14	16.26	0.12	1.35	unconfined		0.72
S-431	10/14/2021	15.90	16.03	0.13	1.58	unconfined		0.72
S-431	10/21/2021	16.33	16.39	0.06	1.17	unconfined		0.72
S-431	10/28/2021	17.93	17.94	0.01	-0.41	unconfined		0.72
S-431	11/4/2021	16.01	16.06	0.05	1.50	unconfined		0.72
S-431	11/11/2021	16.20	16.22	0.02	1.31	unconfined		0.72
S-431	11/24/2021	16.66	16.69	0.03	0.85	unconfined		0.72
S-431	12/22/2021	--	17.04	--	0.48	unconfined		0.72
S-431	12/30/2021	--	16.95	--	0.57	unconfined		0.72

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S-431	1/4/2022	--	16.92	--	0.60	unconfined		0.72
S-431	1/12/2022	--	17.15	--	0.37	unconfined		0.72
S-431	1/25/2022	--	17.11	--	0.41	unconfined		0.72
S-431	2/8/2022	--	17.16	--	0.36	unconfined		0.72
S-431	2/14/2022	--	17.32	--	0.20	unconfined		0.72
S-431	2/24/2022	--	17.39	--	0.13	unconfined		0.72
S-431	2/28/2022	--	17.29	--	0.23	unconfined		0.72
S-431	3/17/2022	--	17.45	--	0.07	unconfined		0.72
S-431	3/31/2022	--	12.73	--	4.79	unconfined		0.72
S-431	4/8/2022	--	17.30	--	0.22	unconfined		0.72
S-431	4/12/2022	--	12.07	--	5.45	unconfined		0.72
S-431	4/20/2022	--	16.45	--	1.07	unconfined		0.72
S-431	4/25/2022	--	16.55	--	0.97	unconfined		0.72
S-431	5/2/2022	--	15.72	--	1.80	unconfined		0.72
S-431	5/9/2022	--	16.21	--	1.31	unconfined		0.72
S-431	5/26/2022	--	15.45	--	2.07	unconfined		0.72
S-431	6/15/2022	--	15.91	--	1.61	unconfined		0.72
S-431	7/14/2022	--	16.61	--	0.91	unconfined		0.72
S-431	7/18/2022	--	15.69	--	1.83	unconfined		0.72
S-431	7/26/2022	--	16.95	--	0.57	unconfined		0.72
S-431	8/1/2022	--	17.04	--	0.48	unconfined		0.72
S-431	8/9/2022	--	17.15	--	0.37	unconfined		0.72
S-431	8/24/2022	--	16.92	--	0.60	unconfined		0.72
S-431	8/29/2022	--	17.06	--	0.46	unconfined		0.72
S-431	9/8/2022	--	16.64	--	0.88	unconfined		0.72
S-431	9/22/2022	--	16.96	--	0.56	unconfined		0.72
S-431	9/28/2022	--	17.27	--	0.25	unconfined		0.72
S-431	10/13/2022	--	16.69	--	0.83	unconfined		0.72
S-431	10/20/2022	--	16.75	--	0.77	unconfined		0.72
S-431	10/27/2022	--	16.85	--	0.67	unconfined		0.72
S-431	11/1/2022	--	16.91	--	0.61	unconfined		0.72
S-431	11/10/2022	--	17.18	--	0.34	unconfined		0.72
S-431	11/16/2022	--	16.93	--	0.59	unconfined		0.72
S-431	11/30/2022	--	17.20	--	0.32	unconfined		0.72
S-431	12/14/2022	--	14.59	--	2.93	unconfined		0.72
S-431	12/28/2022	--	14.38	--	3.14	unconfined		0.72
S-431	1/3/2023	--	14.34	--	3.18	unconfined		0.72
S-431	1/10/2023	--	14.25	--	3.27	unconfined		0.72
S-431	1/19/2023	--	14.12	--	3.40	unconfined		0.72
S-431	1/26/2023	--	14.85	--	2.67	unconfined		0.72
S-431	1/31/2023	--	15.53	--	1.99	unconfined		0.72
S-431	2/7/2023	--	16.49	--	1.03	unconfined		0.72
S-431	2/16/2023	--	16.60	--	0.92	unconfined		0.72
S-431	2/28/2023	--	16.35	--	1.17	unconfined		0.72
S-431	3/7/2023	--	16.25	--	1.27	unconfined		0.72
S-431	3/16/2023	--	16.79	--	0.73	unconfined		0.72
S-431	3/23/2023	--	17.04	--	0.48	unconfined		0.72
S-431	3/29/2023	--	17.07	--	0.45	unconfined		0.72
S-431	4/5/2023	--	17.22	--	0.30	unconfined		0.72
S-431	4/13/2023	--	17.31	--	0.21	unconfined		0.72
S-431	4/19/2023	--	17.23	--	0.29	unconfined		0.72
S-431	4/26/2023	--	17.28	--	0.24	unconfined		0.72
S-431	5/3/2023	--	15.90	--	1.62	unconfined		0.72
S-431	5/10/2023	--	16.33	--	1.19	unconfined		0.72
S-431	5/16/2023	--	16.80	--	0.72	unconfined		0.72
S-431	5/23/2023	--	17.00	--	0.52	unconfined		0.72
S-431	5/31/2023	--	17.13	--	0.39	unconfined		0.72
S-431	6/7/2023	--	16.92	--	0.60	unconfined		0.72
S-431	6/20/2023	--	17.05	--	0.47	unconfined		0.72
S-431	6/27/2023	--	16.10	--	1.42	unconfined		0.72
S-431	7/19/2023	--	15.42	--	2.10	unconfined		0.72
S-431	7/26/2023	--	15.61	--	1.91	unconfined		0.72
S-431	8/2/2023	--	15.75	--	1.77	unconfined		0.72
S-431	8/9/2023	--	15.58	--	1.94	unconfined		0.72
S-431	9/5/2023	--	16.49	--	1.03	unconfined		0.72
S-431	9/15/2023	--	16.54	--	0.98	unconfined		0.72
S-431	9/20/2023	--	16.40	--	1.12	unconfined		0.72

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-431	9/27/2023	--	15.32	--	2.20	unconfined		0.72
S-431	10/4/2023	--	15.58	--	1.94	unconfined		0.72
S-431	10/17/2023	--	16.13	--	1.39	unconfined		0.72
S-431	10/26/2023	--	16.58	--	0.94	unconfined		0.72
S-431	11/1/2023	--	16.60	--	0.92	unconfined		0.72
S-431	11/9/2023	--	16.65	--	0.87	unconfined		0.72
S-431	11/13/2023	--	16.88	--	0.64	unconfined		0.72
S-431	11/22/2023	--	16.22	--	1.30	unconfined		0.72
S-431	11/29/2023	--	16.68	--	0.84	unconfined		0.72
S-431	12/14/2023	--	16.05	--	1.47	unconfined		0.72
S-431	12/20/2023	--	14.95	--	2.57	unconfined		0.72
S-431	1/3/2024	--	15.23	--	2.29	unconfined		0.72
S-431	1/11/2024	--	14.41	--	3.11	unconfined		0.72
S-431	1/18/2024	--	14.82	--	2.70	unconfined		0.72
S-431	1/24/2024	--	15.43	--	2.09	unconfined		0.72
S-431	1/30/2024	--	14.86	--	2.66	unconfined		0.72
S-431	2/5/2024	--	14.90	--	2.62	unconfined		0.72
S-431	2/15/2024	--	15.50	--	2.02	unconfined		0.72
S-431	2/21/2024	--	15.79	--	1.73	unconfined		0.72
S-431	2/28/2024	--	15.88	--	1.64	unconfined		0.72
S-431	3/5/2024	--	15.77	--	1.75	unconfined		0.72
S-431	3/20/2024	--	15.40	--	2.12	unconfined		0.72
S-431	3/28/2024	--	14.82	--	2.70	unconfined		0.72
S-431	4/3/2024	--	14.15	--	3.37	unconfined		0.72
S-431	4/9/2024	--	14.30	--	3.22	unconfined		0.72
S-431	4/25/2024	--	14.95	--	2.57	unconfined		0.72
S-431	4/30/2024	--	14.97	--	2.55	unconfined		0.72
S-431	5/8/2024	--	15.05	--	2.47	unconfined		0.72
S-431	5/20/2024	--	15.21	--	2.31	unconfined		0.72
S-431	5/31/2024	--	15.49	--	2.03	unconfined		0.72
S-431	6/5/2024	--	15.59	--	1.93	unconfined		0.72
S-431	6/12/2024	--	15.42	--	2.10	unconfined		0.72
S-431	6/19/2024	--	15.93	--	1.59	unconfined		0.72
S-431	6/26/2024	--	16.22	--	1.30	unconfined		0.72
S-431	7/2/2024	--	15.47	--	2.05	unconfined		0.72
S-431	7/10/2024	--	15.41	--	2.11	unconfined		0.72
S-431	7/16/2024	--	15.58	--	1.94	unconfined		0.72
S-431	7/24/2024	--	15.61	--	1.91	unconfined		0.72
S-431	8/1/2024	--	16.43	--	1.09	unconfined		0.72
S-431	8/6/2024	--	16.50	--	1.02	unconfined		0.72
S-431	8/23/2024	--	15.30	--	2.22	unconfined		0.72
S-431	8/28/2024	--	15.58	--	1.94	unconfined		0.72
S-431	9/4/2024	--	15.89	--	1.63	unconfined		0.72
S-431	9/11/2024	--	16.20	--	1.32	unconfined		0.72
S-431	9/18/2024	--	16.30	--	1.22	unconfined		0.72
S-431	9/25/2024	--	15.75	--	1.77	unconfined		0.72
S-431	10/1/2024	--	16.11	--	1.41	unconfined		0.72
S-431	10/14/2024	--	16.82	--	0.70	unconfined		0.72
S-431	10/28/2024	--	17.23	--	0.29	unconfined		0.72
S-431	11/8/2024	--	17.48	--	0.04	unconfined		0.72
S-431	11/15/2024	--	17.48	--	0.04	unconfined		0.72
S-431	11/20/2024	--	17.41	--	0.11	unconfined		0.72
S-431	11/26/2024	--	17.23	--	0.29	unconfined		0.72
S-431	12/4/2024	--	16.72	--	0.80	unconfined		0.72
S-431	12/11/2024	--	16.89	--	0.63	unconfined		0.72
S-431	12/17/2024	--	16.13	--	1.39	unconfined		0.72
S-431	1/8/2025	--	16.55	--	0.97	unconfined		0.72
S-431	1/16/2025	--	16.90	--	0.62	unconfined		0.72
S-431	1/24/2025	--	17.30	--	0.22	unconfined		0.72
S-431	1/29/2025	--	17.38	--	0.14	unconfined		0.72
S-431	2/5/2025	--	17.14	--	0.38	unconfined		0.72
S-431	2/12/2025	--	16.80	--	0.72	unconfined		0.72
S-431	2/20/2025	--	16.55	--	0.97	unconfined		0.72
S-432	9/21/2018	20.26	22.69	2.43	1.08	unconfined		0.72
S-432	9/26/2018	20.32	22.68	2.36	1.04	unconfined		0.72
S-432	9/27/2018	20.31	22.75	2.44	1.03	unconfined		0.72
S-432	10/1/2018	20.26	22.31	2.05	1.19	unconfined		0.72

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-432	10/10/2018	20.75	23.10	2.35	0.62	unconfined		0.72
S-432	11/13/2018	20.37	22.51	2.14	1.05	unconfined		0.72
S-432	11/27/2018	19.85	22.00	2.15	1.57	unconfined		0.72
S-432	12/27/2018	20.27	22.27	2.00	1.19	unconfined		0.72
S-432	1/9/2019	19.93	21.83	1.90	1.56	unconfined		0.72
S-432	2/12/2019	20.27	22.28	2.01	1.19	unconfined		0.72
S-432	3/21/2019	20.48	22.10	1.62	1.09	unconfined		0.72
S-432	4/1/2019	20.81	22.41	1.60	0.76	unconfined		0.72
S-432	5/9/2019	20.76	22.22	1.46	0.85	unconfined		0.72
S-432	6/13/2019	20.82	22.19	1.37	0.82	unconfined		0.72
S-432	7/5/2019	20.54	20.83	0.29	1.40	unconfined		0.72
S-432	8/6/2019	20.88	21.22	0.34	1.05	unconfined		0.72
S-432	9/6/2019	21.29	21.41	0.12	0.70	unconfined		0.72
S-432	10/18/2019	21.50	23.02	1.52	0.10	unconfined		0.72
S-432	11/14/2019	21.57	23.22	1.65	-0.01	unconfined		0.72
S-432	11/22/2019	21.50	23.11	1.61	0.07	unconfined		0.72
S-432	12/10/2019	21.68	23.24	1.56	-0.09	unconfined		0.72
S-432	12/30/2019	22.74	23.80	1.06	-1.01	unconfined		0.72
S-432	1/17/2020	21.78	23.10	1.32	-0.13	unconfined		0.72
S-432	1/21/2020	21.71	23.18	1.47	-0.10	unconfined		0.72
S-432	1/23/2020	21.17	23.17	2.00	0.29	unconfined		0.72
S-432	1/27/2020	21.53	22.45	0.92	0.23	unconfined		0.72
S-432	1/28/2020	21.51	22.42	0.91	0.26	unconfined		0.72
S-432	1/30/2020	21.51	22.43	0.92	0.25	unconfined		0.72
S-432	1/31/2020	21.51	22.41	0.90	0.26	unconfined		0.72
S-432	2/3/2020	21.41	22.42	1.01	0.33	unconfined		0.72
S-432	2/4/2020	21.41	22.50	1.09	0.31	unconfined		0.72
S-432	2/7/2020	21.39	22.50	1.11	0.32	unconfined		0.72
S-432	2/10/2020	21.50	22.80	1.30	0.16	unconfined		0.72
S-432	2/13/2020	21.42	22.55	1.13	0.29	unconfined		0.72
S-432	2/21/2020	22.51	22.80	0.29	-0.57	unconfined		0.72
S-432	2/24/2020	21.56	22.72	1.16	0.14	unconfined		0.72
S-432	2/25/2020	21.50	22.61	1.11	0.21	unconfined		0.72
S-432	2/27/2020	21.41	22.66	1.25	0.26	unconfined		0.72
S-432	2/28/2020	21.46	22.79	1.33	0.19	unconfined		0.72
S-432	3/2/2020	21.86	22.97	1.11	-0.15	unconfined		0.72
S-432	3/10/2020	21.67	22.73	1.06	0.06	unconfined		0.72
S-432	3/13/2020	21.63	22.58	0.95	0.13	unconfined		0.72
S-432	3/16/2020	21.69	22.84	1.15	0.01	unconfined		0.72
S-432	3/17/2020	21.65	22.78	1.13	0.06	unconfined		0.72
S-432	3/19/2020	21.69	22.74	1.05	0.04	unconfined		0.72
S-432	3/23/2020	21.64	22.69	1.05	0.09	unconfined		0.72
S-432	3/24/2020	21.64	22.51	0.87	0.14	unconfined		0.72
S-432	3/26/2020	21.56	22.28	0.72	0.26	unconfined		0.72
S-432	3/30/2020	21.16	22.19	1.03	0.57	unconfined		0.72
S-432	4/2/2020	21.97	22.12	0.15	0.01	unconfined		0.72
S-432	4/10/2020	21.10	22.20	1.10	0.61	unconfined		0.72
S-432	4/14/2020	21.25	22.37	1.12	0.46	unconfined		0.72
S-432	4/16/2020	20.20	22.30	2.10	1.24	unconfined		0.72
S-432	4/17/2020	21.24	22.47	1.23	0.44	unconfined		0.72
S-432	4/20/2020	21.21	22.27	1.06	0.52	unconfined		0.72
S-432	4/21/2020	21.15	22.24	1.09	0.57	unconfined		0.72
S-432	4/23/2020	21.31	22.52	1.21	0.37	unconfined		0.72
S-432	4/24/2020	21.22	23.39	2.17	0.20	unconfined		0.72
S-432	4/27/2020	21.21	23.22	2.01	0.25	unconfined		0.72
S-432	4/28/2020	21.26	22.41	1.15	0.44	unconfined		0.72
S-432	4/30/2020	21.20	22.22	1.02	0.54	unconfined		0.72
S-432	5/1/2020	21.12	22.12	1.00	0.62	unconfined		0.72
S-432	5/4/2020	21.11	22.26	1.15	0.59	unconfined		0.72
S-432	5/8/2020	21.10	22.25	1.15	0.60	unconfined		0.72
S-432	5/12/2020	21.35	22.65	1.30	0.31	unconfined		0.72
S-432	5/14/2020	21.43	22.70	1.27	0.24	unconfined		0.72
S-432	5/18/2020	21.46	22.68	1.22	0.22	unconfined		0.72
S-432	5/19/2020	21.47	22.69	1.22	0.21	unconfined		0.72
S-432	5/21/2020	21.52	22.54	1.02	0.22	unconfined		0.72
S-432	5/26/2020	21.46	22.49	1.03	0.27	unconfined		0.72
S-432	5/28/2020	21.44	22.56	1.12	0.27	unconfined		0.72

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S-432	6/1/2020	21.47	22.62	1.15	0.23	unconfined		0.72
S-432	6/4/2020	21.42	22.59	1.17	0.27	unconfined		0.72
S-432	6/5/2020	21.42	22.59	1.17	0.27	unconfined		0.72
S-432	6/8/2020	21.33	21.82	0.49	0.55	unconfined		0.72
S-432	6/11/2020	21.34	22.23	0.89	0.43	unconfined		0.72
S-432	6/16/2020	21.40	22.44	1.04	0.33	unconfined		0.72
S-432	6/18/2020	21.40	22.44	1.04	0.33	unconfined		0.72
S-432	6/19/2020	21.40	22.55	1.15	0.30	unconfined		0.72
S-432	6/22/2020	21.43	22.71	1.28	0.23	unconfined		0.72
S-432	6/26/2020	21.44	22.54	1.10	0.27	unconfined		0.72
S-432	7/1/2020	21.51	22.64	1.13	0.20	unconfined		0.72
S-432	7/7/2020	21.51	22.70	1.19	0.18	unconfined		0.72
S-432	7/9/2020	21.48	21.63	0.15	0.50	unconfined		0.72
S-432	7/14/2020	21.15	22.94	1.79	0.37	unconfined		0.72
S-432	7/17/2020	21.15	22.94	1.79	0.37	unconfined		0.72
S-432	7/22/2020	21.28	22.35	1.07	0.44	unconfined		0.72
S-432	7/23/2020	21.22	21.27	0.05	0.79	unconfined		0.72
S-432	7/24/2020	21.22	21.27	0.05	0.79	unconfined		0.72
S-432	7/28/2020	21.35	22.42	1.07	0.37	unconfined		0.72
S-432	7/30/2020	21.43	22.58	1.15	0.27	unconfined		0.72
S-432	8/4/2020	21.45	22.60	1.15	0.25	unconfined		0.72
S-432	8/6/2020	21.35	22.42	1.07	0.37	unconfined		0.72
S-432	8/18/2020	20.90	21.83	0.93	0.86	unconfined		0.72
S-432	8/25/2020	20.88	21.83	0.95	0.88	unconfined		0.72
S-432	8/27/2020	21.13	22.04	0.91	0.64	unconfined		0.72
S-432	9/3/2020	21.21	22.19	0.98	0.54	unconfined		0.72
S-432	9/11/2020	21.31	22.20	0.89	0.46	unconfined		0.72
S-432	9/16/2020	21.34	22.46	1.12	0.37	unconfined		0.72
S-432	9/18/2020	20.58	21.33	0.75	1.23	unconfined		0.72
S-432	9/22/2020	21.37	21.39	0.02	0.64	unconfined		0.72
S-432	9/24/2020	21.36	22.48	1.12	0.35	unconfined		0.72
S-432	10/1/2020	21.37	21.39	0.02	0.64	unconfined		0.72
S-432	10/8/2020	21.36	22.24	0.88	0.42	unconfined		0.72
S-432	10/19/2020	21.45	22.41	0.96	0.30	unconfined		0.72
S-432	10/23/2020	21.43	22.35	0.92	0.33	unconfined		0.72
S-432	10/30/2020	21.43	23.28	1.85	0.08	unconfined		0.72
S-432	11/2/2020	21.26	21.58	0.32	0.67	unconfined		0.72
S-432	11/9/2020	21.39	22.20	0.81	0.40	unconfined		0.72
S-432	11/10/2020	21.44	22.35	0.91	0.33	unconfined		0.72
S-432	11/19/2020	21.35	22.08	0.73	0.47	unconfined		0.72
S-432	11/23/2020	21.24	22.06	0.82	0.55	unconfined		0.72
S-432	11/30/2020	21.27	21.88	0.61	0.58	unconfined		0.72
S-432	12/4/2020	21.27	21.96	0.69	0.56	unconfined		0.72
S-432	12/8/2020	21.21	21.79	0.58	0.65	unconfined		0.72
S-432	12/11/2020	21.27	21.85	0.58	0.59	unconfined		0.72
S-432	12/21/2020	21.12	21.66	0.54	0.75	unconfined		0.72
S-432	12/28/2020	20.63	20.94	0.31	1.30	unconfined		0.72
S-432	12/31/2020	20.74	20.78	0.04	1.27	unconfined		0.72
S-432	1/4/2021	20.65	21.40	0.75	1.16	unconfined		0.72
S-432	1/8/2021	20.60	21.30	0.70	1.23	unconfined		0.72
S-432	1/15/2021	20.81	21.57	0.76	1.00	unconfined		0.72
S-432	1/25/2021	21.29	21.86	0.57	0.57	unconfined		0.72
S-432	2/3/2021	21.21	21.92	0.71	0.61	unconfined		0.72
S-432	2/3/2021	21.21	21.92	0.71	0.61	unconfined		0.72
S-432	2/4/2021	21.24	21.96	0.72	0.58	unconfined		0.72
S-432	2/9/2021	21.27	21.96	0.69	0.56	unconfined		0.72
S-432	2/12/2021	21.15	21.87	0.72	0.67	unconfined		0.72
S-432	2/17/2021	21.11	21.83	0.72	0.71	unconfined		0.72
S-432	2/19/2021	20.99	21.11	0.12	1.00	unconfined		0.72
S-432	2/23/2021	20.96	21.73	0.77	0.85	unconfined		0.72
S-432	2/26/2021	20.92	21.78	0.86	0.86	unconfined		0.72
S-432	3/1/2021	20.68	21.57	0.89	1.09	unconfined		0.72
S-432	3/5/2021	20.66	21.56	0.90	1.11	unconfined		0.72
S-432	3/8/2021	20.86	21.71	0.85	0.92	unconfined		0.72
S-432	3/12/2021	20.06	20.89	0.83	1.73	unconfined		0.72
S-432	3/15/2021	21.20	21.82	0.62	0.65	unconfined		0.72
S-432	3/19/2021	20.96	21.75	0.79	0.84	unconfined		0.72

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-432	3/25/2021	20.81	21.66	0.85	0.97	unconfined		0.72
S-432	3/29/2021	20.71	21.54	0.83	1.08	unconfined		0.72
S-432	4/1/2021	20.69	21.49	0.80	1.11	unconfined		0.72
S-432	4/7/2021	20.46	21.64	1.18	1.23	unconfined		0.72
S-432	4/9/2021	20.68	21.56	0.88	1.10	unconfined		0.72
S-432	4/11/2021	20.62	21.38	0.76	1.19	unconfined		0.72
S-432	4/13/2021	20.54	21.37	0.83	1.25	unconfined		0.72
S-432	4/20/2021	20.62	21.37	0.75	1.19	unconfined		0.72
S-432	4/23/2021	20.85	21.58	0.73	0.97	unconfined		0.72
S-432	5/3/2021	20.87	21.53	0.66	0.97	unconfined		0.72
S-432	5/6/2021	20.98	21.65	0.67	0.85	unconfined		0.72
S-432	5/11/2021	21.04	21.71	0.67	0.79	unconfined		0.72
S-432	5/14/2021	21.11	21.74	0.63	0.73	unconfined		0.72
S-432	5/20/2021	21.21	21.87	0.66	0.63	unconfined		0.72
S-432	5/25/2021	21.24	21.92	0.68	0.59	unconfined		0.72
S-432	6/3/2021	20.93	21.58	0.65	0.91	unconfined		0.72
S-432	6/4/2021	20.91	21.54	0.63	0.93	unconfined		0.72
S-432	6/14/2021	20.77	21.40	0.63	1.07	unconfined		0.72
S-432	6/18/2021	20.52	21.15	0.63	1.32	unconfined		0.72
S-432	6/22/2021	19.73	20.62	0.89	2.04	unconfined		0.72
S-432	6/23/2021	20.52	21.15	0.63	1.32	unconfined		0.72
S-432	6/24/2021	20.83	21.47	0.64	1.01	unconfined		0.72
S-432	6/24/2021	20.83	21.47	0.64	1.01	unconfined		0.72
S-432	6/29/2021	20.83	21.47	0.64	1.01	unconfined		0.72
S-432	7/1/2021	20.95	21.55	0.60	0.90	unconfined		0.72
S-432	7/6/2021	20.76	21.39	0.63	1.08	unconfined		0.72
S-432	7/9/2021	20.85	21.18	0.33	1.08	unconfined		0.72
S-432	7/13/2021	20.86	21.44	0.58	1.00	unconfined		0.72
S-432	7/20/2021	20.57	21.16	0.59	1.29	unconfined		0.72
S-432	7/23/2021	20.64	21.28	0.64	1.20	unconfined		0.72
S-432	7/27/2021	20.71	21.39	0.68	1.12	unconfined		0.72
S-432	7/30/2021	20.71	21.40	0.69	1.12	unconfined		0.72
S-432	8/3/2021	20.90	21.56	0.66	0.94	unconfined		0.72
S-432	8/10/2021	20.01	21.66	1.65	1.55	unconfined		0.72
S-432	8/13/2021	20.98	21.58	0.60	0.87	unconfined		0.72
S-432	8/20/2021	21.50	21.68	0.18	0.47	unconfined		0.72
S-432	8/24/2021	20.88	21.50	0.62	0.97	unconfined		0.72
S-432	8/27/2021	20.86	21.48	0.62	0.99	unconfined		0.72
S-432	9/3/2021	20.25	20.82	0.57	1.61	unconfined		0.72
S-432	9/10/2021	20.35	21.50	1.15	1.35	unconfined		0.72
S-432	9/16/2021	20.63	21.30	0.67	1.20	unconfined		0.72
S-432	9/22/2021	20.66	21.24	0.58	1.20	unconfined		0.72
S-432	9/24/2021	20.51	21.08	0.57	1.35	unconfined		0.72
S-432	9/29/2021	20.57	21.17	0.60	1.28	unconfined		0.72
S-432	10/5/2021	20.72	21.34	0.62	1.13	unconfined		0.72
S-432	10/14/2021	20.58	21.16	0.58	1.28	unconfined		0.72
S-432	10/21/2021	20.86	21.49	0.63	0.98	unconfined		0.72
S-432	10/28/2021	20.70	21.28	0.58	1.16	unconfined		0.72
S-432	11/4/2021	20.66	21.19	0.53	1.21	unconfined		0.72
S-432	11/11/2021	20.81	21.38	0.57	1.05	unconfined		0.72
S-432	11/18/2021	21.02	21.55	0.53	0.85	unconfined		0.72
S-432	11/24/2021	21.21	21.76	0.55	0.66	unconfined		0.72
S-432	12/22/2021	21.53	22.18	0.65	0.31	unconfined		0.72
S-432	12/30/2021	21.47	22.23	0.76	0.34	unconfined		0.72
S-432	1/4/2022	21.42	22.22	0.80	0.38	unconfined		0.72
S-432	1/12/2022	21.62	22.64	1.02	0.12	unconfined		0.72
S-432	1/25/2022	21.58	22.52	0.94	0.18	unconfined		0.72
S-432	2/8/2022	21.70	22.66	0.96	0.05	unconfined		0.72
S-432	2/14/2022	21.79	22.83	1.04	-0.06	unconfined		0.72
S-432	2/24/2022	21.87	22.85	0.98	-0.12	unconfined		0.72
S-432	2/28/2022	21.84	22.83	0.99	-0.10	unconfined		0.72
S-432	3/17/2022	21.96	23.10	1.14	-0.26	unconfined		0.72
S-432	3/24/2022	21.72	21.85	0.13	0.26	unconfined		0.72
S-432	3/31/2022	21.77	22.71	0.94	-0.01	unconfined		0.72
S-432	4/8/2022	21.84	22.74	0.90	-0.07	unconfined		0.72
S-432	4/12/2022	21.21	21.89	0.68	0.62	unconfined		0.72
S-432	4/20/2022	21.22	21.84	0.62	0.63	unconfined		0.72

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-432	4/25/2022	21.22	21.83	0.61	0.63	unconfined		0.72
S-432	5/2/2022	21.40	21.98	0.58	0.46	unconfined		0.72
S-432	5/9/2022	21.15	21.72	0.57	0.71	unconfined		0.72
S-432	5/26/2022	21.24	21.77	0.53	0.63	unconfined		0.72
S-432	6/15/2022	20.92	21.42	0.50	0.96	unconfined		0.72
S-432	7/14/2022	21.37	21.64	0.27	0.57	unconfined		0.72
S-432	7/18/2022	21.42	21.71	0.29	0.52	unconfined		0.72
S-432	7/26/2022	21.70	21.96	0.26	0.25	unconfined		0.72
S-432	8/1/2022	21.77	21.95	0.18	0.20	unconfined		0.72
S-432	8/9/2022	21.90	22.04	0.14	0.08	unconfined		0.72
S-432	8/24/2022	21.77	21.79	0.02	0.24	unconfined		0.72
S-432	8/29/2022	21.87	21.88	0.01	0.15	unconfined		0.72
S-432	9/8/2022	--	21.85	--	0.17	unconfined		0.72
S-432	9/22/2022	--	21.85	--	0.17	unconfined		0.72
S-432	9/28/2022	--	22.05	--	-0.03	unconfined		0.72
S-432	10/13/2022	--	21.63	--	0.39	unconfined		0.72
S-432	10/20/2022	--	21.71	--	0.31	unconfined		0.72
S-432	10/27/2022	--	21.76	--	0.26	unconfined		0.72
S-432	11/1/2022	--	21.82	--	0.20	unconfined		0.72
S-432	11/10/2022	--	22.03	--	-0.01	unconfined		0.72
S-432	11/16/2022	--	22.00	--	0.02	unconfined		0.72
S-432	11/22/2022	--	22.15	--	-0.13	unconfined		0.72
S-432	11/30/2022	--	22.10	--	-0.08	unconfined		0.72
S-432	12/14/2022	--	19.81	--	2.21	unconfined		0.72
S-432	12/28/2022	--	19.48	--	2.54	unconfined		0.72
S-432	1/3/2023	--	19.45	--	2.57	unconfined		0.72
S-432	1/10/2023	--	19.39	--	2.63	unconfined		0.72
S-432	1/19/2023	--	19.35	--	2.67	unconfined		0.72
S-432	1/26/2023	--	20.23	--	1.79	unconfined		0.72
S-432	1/31/2023	--	20.76	--	1.26	unconfined		0.72
S-432	2/7/2023	--	21.40	--	0.62	unconfined		0.72
S-432	2/16/2023	--	21.49	--	0.53	unconfined		0.72
S-432	2/28/2023	--	21.44	--	0.58	unconfined		0.72
S-432	3/7/2023	--	21.45	--	0.57	unconfined		0.72
S-432	3/16/2023	--	21.69	--	0.33	unconfined		0.72
S-432	3/23/2023	--	21.79	--	0.23	unconfined		0.72
S-432	3/29/2023	--	21.81	--	0.21	unconfined		0.72
S-432	4/5/2023	--	21.90	--	0.12	unconfined		0.72
S-432	4/13/2023	--	21.98	--	0.04	unconfined		0.72
S-432	4/19/2023	--	21.98	--	0.04	unconfined		0.72
S-432	4/26/2023	--	21.97	--	0.05	unconfined		0.72
S-432	5/3/2023	--	21.16	--	0.86	unconfined		0.72
S-432	5/10/2023	--	21.35	--	0.67	unconfined		0.72
S-432	5/16/2023	--	21.55	--	0.47	unconfined		0.72
S-432	5/23/2023	--	21.79	--	0.23	unconfined		0.72
S-432	5/31/2023	--	21.90	--	0.12	unconfined		0.72
S-432	6/7/2023	--	21.81	--	0.21	unconfined		0.72
S-432	6/20/2023	--	21.95	--	0.07	unconfined		0.72
S-432	6/27/2023	--	21.77	--	0.25	unconfined		0.72
S-432	7/19/2023	--	20.85	--	1.17	unconfined		0.72
S-432	7/26/2023	--	20.71	--	1.31	unconfined		0.72
S-432	8/2/2023	--	20.91	--	1.11	unconfined		0.72
S-432	8/9/2023	--	20.81	--	1.21	unconfined		0.72
S-432	8/23/2023	--	21.08	--	0.94	unconfined		0.72
S-432	8/30/2023	--	21.11	--	0.91	unconfined		0.72
S-432	9/5/2023	--	21.25	--	0.77	unconfined		0.72
S-432	9/15/2023	--	21.29	--	0.73	unconfined		0.72
S-432	9/20/2023	--	21.21	--	0.81	unconfined		0.72
S-432	9/27/2023	--	20.66	--	1.36	unconfined		0.72
S-432	10/4/2023	--	20.68	--	1.34	unconfined		0.72
S-432	10/17/2023	--	20.96	--	1.06	unconfined		0.72
S-432	10/26/2023	--	21.30	--	0.72	unconfined		0.72
S-432	11/1/2023	--	21.31	--	0.71	unconfined		0.72
S-432	11/9/2023	--	21.42	--	0.60	unconfined		0.72
S-432	11/13/2023	--	21.59	--	0.43	unconfined		0.72
S-432	11/22/2023	--	21.56	--	0.46	unconfined		0.72
S-432	11/29/2023	--	21.53	--	0.49	unconfined		0.72

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-432	12/14/2023	--	21.14	--	0.88	unconfined		0.72
S-432	12/20/2023	--	20.18	--	1.84	unconfined		0.72
S-432	1/3/2024	--	20.17	--	1.85	unconfined		0.72
S-432	1/11/2024	--	19.58	--	2.44	unconfined		0.72
S-432	1/18/2024	--	19.80	--	2.22	unconfined		0.72
S-432	1/24/2024	--	20.38	--	1.64	unconfined		0.72
S-432	1/30/2024	--	19.88	--	2.14	unconfined		0.72
S-432	2/5/2024	--	19.87	--	2.15	unconfined		0.72
S-432	2/15/2024	--	20.34	--	1.68	unconfined		0.72
S-432	2/21/2024	--	20.64	--	1.38	unconfined		0.72
S-432	2/28/2024	--	20.64	--	1.38	unconfined		0.72
S-432	3/5/2024	--	20.75	--	1.27	unconfined		0.72
S-432	3/20/2024	--	20.29	--	1.73	unconfined		0.72
S-432	3/28/2024	--	19.76	--	2.26	unconfined		0.72
S-432	4/3/2024	--	19.74	--	2.28	unconfined		0.72
S-432	4/9/2024	--	19.28	--	2.74	unconfined		0.72
S-432	4/25/2024	--	19.98	--	2.04	unconfined		0.72
S-432	4/30/2024	--	20.10	--	1.92	unconfined		0.72
S-432	5/8/2024	--	20.25	--	1.77	unconfined		0.72
S-432	5/20/2024	--	20.46	--	1.56	unconfined		0.72
S-432	5/31/2024	--	20.75	--	1.27	unconfined		0.72
S-432	6/5/2024	--	20.87	--	1.15	unconfined		0.72
S-432	6/12/2024	--	20.81	--	1.21	unconfined		0.72
S-432	6/19/2024	--	21.02	--	1.00	unconfined		0.72
S-432	6/26/2024	--	21.14	--	0.88	unconfined		0.72
S-432	7/2/2024	--	21.05	--	0.97	unconfined		0.72
S-432	7/10/2024	--	20.75	--	1.27	unconfined		0.72
S-432	7/16/2024	--	20.90	--	1.12	unconfined		0.72
S-432	7/24/2024	--	21.05	--	0.97	unconfined		0.72
S-432	8/1/2024	--	21.32	--	0.70	unconfined		0.72
S-432	8/6/2024	--	21.30	--	0.72	unconfined		0.72
S-432	8/23/2024	--	20.50	--	1.52	unconfined		0.72
S-432	8/28/2024	--	20.68	--	1.34	unconfined		0.72
S-432	9/4/2024	--	20.94	--	1.08	unconfined		0.72
S-432	9/11/2024	--	21.05	--	0.97	unconfined		0.72
S-432	9/18/2024	--	21.23	--	0.79	unconfined		0.72
S-432	9/25/2024	--	21.08	--	0.94	unconfined		0.72
S-432	10/1/2024	--	21.20	--	0.82	unconfined		0.72
S-432	10/14/2024	--	21.54	--	0.48	unconfined		0.72
S-432	10/28/2024	--	21.95	--	0.07	unconfined		0.72
S-432	11/8/2024	--	22.15	--	-0.13	unconfined		0.72
S-432	11/15/2024	--	22.16	--	-0.14	unconfined		0.72
S-432	11/20/2024	--	22.13	--	-0.11	unconfined		0.72
S-432	11/26/2024	--	22.27	--	-0.25	unconfined		0.72
S-432	12/4/2024	--	22.28	--	-0.26	unconfined		0.72
S-432	12/11/2024	--	22.27	--	-0.25	unconfined		0.72
S-432	12/17/2024	--	22.10	--	-0.08	unconfined		0.72
S-432	1/8/2025	--	21.93	--	0.09	unconfined		0.72
S-432	1/16/2025	--	22.24	--	-0.22	unconfined		0.72
S-432	1/24/2025	--	22.35	--	-0.33	unconfined		0.72
S-432	1/29/2025	--	22.40	--	-0.38	unconfined		0.72
S-432	2/5/2025	--	22.40	--	-0.38	unconfined		0.72
S-432	2/12/2025	--	22.43	--	-0.41	unconfined		0.72
S-432	2/20/2025	--	22.35	--	-0.33	unconfined		0.72
S-433	4/17/2020	--	11.27	--	0.41	unconfined		--
S-433	6/5/2020	--	11.47	--	0.21	unconfined		--
S-433	1/25/2022	--	11.70	--	-0.02	unconfined		--
S-433	2/8/2022	--	11.70	--	-0.02	unconfined		--
S-433	2/14/2022	--	11.87	--	-0.19	unconfined		--
S-433	2/24/2022	--	11.89	--	-0.21	unconfined		--
S-433	2/28/2022	--	11.91	--	-0.23	unconfined		--
S-433	3/17/2022	--	12.08	--	-0.40	unconfined		--
S-433	3/31/2022	--	11.80	--	-0.12	unconfined		--
S-433	4/8/2022	--	11.81	--	-0.13	unconfined		--
S-433	4/12/2022	--	11.19	--	0.49	unconfined		--
S-433	4/20/2022	--	11.19	--	0.49	unconfined		--
S-433	4/25/2022	--	11.19	--	0.49	unconfined		--

Table 3-2
Well Gauging Summary, 2018 to Present
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC, Philadelphia, PA

Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-433	5/2/2022	--	11.34	--	0.34	unconfined		--
S-433	5/9/2022	--	11.04	--	0.64	unconfined		--
S-433	5/26/2022	--	11.22	--	0.46	unconfined		--
S-433	6/15/2022	--	10.94	--	0.74	unconfined		--
S-433	7/18/2022	--	11.34	--	0.34	unconfined		--
S-433	7/26/2022	--	11.56	--	0.12	unconfined		--
S-433	8/1/2022	--	11.61	--	0.07	unconfined		--
S-433	8/9/2022	--	11.75	--	-0.07	unconfined		--
S-433	8/24/2022	--	11.73	--	-0.05	unconfined		--
S-433	8/29/2022	--	11.80	--	-0.12	unconfined		--
S-433	9/8/2022	--	11.75	--	-0.07	unconfined		--
S-433	9/22/2022	--	11.75	--	-0.07	unconfined		--
S-433	9/28/2022	--	12.01	--	-0.33	unconfined		--
S-433	10/13/2022	--	11.54	--	0.14	unconfined		--
S-433	10/20/2022	--	11.65	--	0.03	unconfined		--
S-433	10/27/2022	--	11.70	--	-0.02	unconfined		--
S-433	11/1/2022	--	11.69	--	-0.01	unconfined		--
S-433	11/10/2022	--	11.90	--	-0.22	unconfined		--
S-433	11/16/2022	--	11.85	--	-0.17	unconfined		--
S-433	11/22/2022	--	12.04	--	-0.36	unconfined		--
S-433	11/30/2022	--	11.93	--	-0.25	unconfined		--
S-433	12/14/2022	--	10.26	--	1.42	unconfined		--
S-433	12/28/2022	--	9.85	--	1.83	unconfined		--
S-433	1/3/2023	--	9.84	--	1.84	unconfined		--
S-433	1/10/2023	--	9.78	--	1.90	unconfined		--
S-433	1/19/2023	--	9.77	--	1.91	unconfined		--
S-433	1/26/2023	--	10.35	--	1.33	unconfined		--
S-433	1/31/2023	--	10.70	--	0.98	unconfined		--
S-433	2/7/2023	--	11.25	--	0.43	unconfined		--
S-433	2/16/2023	--	11.30	--	0.38	unconfined		--
S-433	2/28/2023	--	11.25	--	0.43	unconfined		--
S-433	3/7/2023	--	11.29	--	0.39	unconfined		--
S-433	3/16/2023	--	11.52	--	0.16	unconfined		--
S-433	3/23/2023	--	11.55	--	0.13	unconfined		--
S-433	3/29/2023	--	11.55	--	0.13	unconfined		--
S-433	4/5/2023	--	11.69	--	-0.01	unconfined		--
S-433	4/13/2023	--	11.70	--	-0.02	unconfined		--
S-433	4/19/2023	--	11.76	--	-0.08	unconfined		--
S-433	4/26/2023	--	11.76	--	-0.08	unconfined		--
S-433	5/3/2023	--	11.11	--	0.57	unconfined		--
S-433	5/10/2023	--	11.19	--	0.49	unconfined		--
S-433	5/16/2023	--	11.36	--	0.32	unconfined		--
S-433	5/23/2023	--	11.54	--	0.14	unconfined		--
S-433	5/31/2023	--	11.63	--	0.05	unconfined		--
S-433	6/7/2023	--	11.68	--	0.00	unconfined		--
S-433	6/20/2023	--	11.80	--	-0.12	unconfined		--
S-433	6/27/2023	--	11.59	--	0.09	unconfined		--
S-433	7/19/2023	--	10.88	--	0.80	unconfined		--
S-433	7/26/2023	--	10.63	--	1.05	unconfined		--
S-433	8/2/2023	--	10.80	--	0.88	unconfined		--
S-433	8/9/2023	--	10.71	--	0.97	unconfined		--
S-433	8/23/2023	--	10.90	--	0.78	unconfined		--
S-433	8/30/2023	--	10.99	--	0.69	unconfined		--
S-433	9/5/2023	--	11.15	--	0.53	unconfined		--
S-433	9/15/2023	--	11.16	--	0.52	unconfined		--
S-433	9/20/2023	--	11.15	--	0.53	unconfined		--
S-433	9/27/2023	--	10.61	--	1.07	unconfined		--
S-433	10/4/2023	--	10.60	--	1.08	unconfined		--
S-433	10/17/2023	--	10.82	--	0.86	unconfined		--
S-433	10/26/2023	--	11.13	--	0.55	unconfined		--
S-433	11/1/2023	--	11.21	--	0.47	unconfined		--
S-433	11/9/2023	--	11.20	--	0.48	unconfined		--
S-433	11/13/2023	--	11.43	--	0.25	unconfined		--
S-433	11/22/2023	--	11.33	--	0.35	unconfined		--
S-433	11/29/2023	--	11.45	--	0.23	unconfined		--
S-433	12/14/2023	--	11.09	--	0.59	unconfined		--
S-433	12/20/2023	--	10.44	--	1.24	unconfined		--

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-433	1/3/2024	--	10.14	--	1.54	unconfined		--
S-433	1/11/2024	--	9.70	--	1.98	unconfined		--
S-433	1/24/2024	--	10.27	--	1.41	unconfined		--
S-433	1/30/2024	--	9.77	--	1.91	unconfined		--
S-433	2/5/2024	--	9.74	--	1.94	unconfined		--
S-433	2/15/2024	--	10.19	--	1.49	unconfined		--
S-433	2/21/2024	--	10.40	--	1.28	unconfined		--
S-433	2/28/2024	--	10.38	--	1.30	unconfined		--
S-433	3/5/2024	--	--	--	--	unconfined	Unable to access	--
S-433	3/20/2024	--	--	--	--	unconfined	Unable to access	--
S-433	3/28/2024	--	9.85	--	1.83	unconfined		--
S-433	4/3/2024	--	9.70	--	1.98	unconfined		--
S-433	4/9/2024	--	9.41	--	2.27	unconfined		--
S-433	4/25/2024	--	9.90	--	1.78	unconfined		--
S-433	4/30/2024	--	9.92	--	1.76	unconfined		--
S-433	5/8/2024	--	10.10	--	1.58	unconfined		--
S-433	5/20/2024	--	10.31	--	1.37	unconfined		--
S-433	5/31/2024	--	10.51	--	1.17	unconfined		--
S-433	6/5/2024	--	10.72	--	0.96	unconfined		--
S-433	6/12/2024	--	10.68	--	1.00	unconfined		--
S-433	6/19/2024	--	10.89	--	0.79	unconfined		--
S-433	6/26/2024	--	--	--	--	unconfined	Unable to access	--
S-433	7/2/2024	--	--	--	--	unconfined	Unable to access	--
S-433	7/10/2024	--	--	--	--	unconfined	Unable to access	--
S-433	7/16/2024	--	--	--	--	unconfined	Unable to access	--
S-433	7/24/2024	--	--	--	--	unconfined	Unable to access	--
S-433	8/1/2024	--	--	--	--	unconfined	Unable to access	--
S-433	8/6/2024	--	--	--	--	unconfined	Unable to access	--
S-433	8/23/2024	--	--	--	--	unconfined	Unable to access	--
S-433	8/28/2024	--	--	--	--	unconfined	Unable to access	--
S-433	9/4/2024	--	10.79	--	0.89	unconfined		--
S-433	9/11/2024	--	10.95	--	0.73	unconfined		--
S-433	9/18/2024	--	11.05	--	0.63	unconfined		--
S-433	9/25/2024	--	11.00	--	0.68	unconfined		--
S-433	10/1/2024	--	11.11	--	0.57	unconfined		--
S-433	10/14/2024	--	11.46	--	0.22	unconfined		--
S-433	10/28/2024	--	11.88	--	-0.20	unconfined		--
S-433	11/8/2024	--	--	--	--	unconfined	Unable to access	--
S-434	4/17/2020	--	12.57	--	0.53	unconfined		--
S-434	6/5/2020	--	12.77	--	0.33	unconfined		--
S-434	1/25/2022	--	13.05	--	0.05	unconfined		--
S-434	2/8/2022	--	12.83	--	0.27	unconfined		--
S-434	2/14/2022	--	13.13	--	-0.03	unconfined		--
S-434	2/24/2022	--	13.15	--	-0.05	unconfined		--
S-434	2/28/2022	--	13.03	--	0.07	unconfined		--
S-434	3/17/2022	--	13.22	--	-0.12	unconfined		--
S-434	4/8/2022	--	13.07	--	0.03	unconfined		--
S-434	4/12/2022	--	12.10	--	1.00	unconfined		--
S-434	4/20/2022	--	12.32	--	0.78	unconfined		--
S-434	4/25/2022	--	12.31	--	0.79	unconfined		--
S-434	5/2/2022	--	12.58	--	0.52	unconfined		--
S-434	5/9/2022	--	12.16	--	0.94	unconfined		--
S-434	5/26/2022	--	12.46	--	0.64	unconfined		--
S-434	6/15/2022	--	12.13	--	0.97	unconfined		--
S-434	7/14/2022	--	12.70	--	0.40	unconfined		--
S-434	7/18/2022	--	12.71	--	0.39	unconfined		--
S-434	7/26/2022	--	12.92	--	0.18	unconfined		--
S-434	8/1/2022	--	13.04	--	0.06	unconfined		--
S-434	8/9/2022	--	13.14	--	-0.04	unconfined		--
S-434	8/24/2022	--	13.20	--	-0.10	unconfined		--
S-434	8/29/2022	--	13.26	--	-0.16	unconfined		--
S-434	9/8/2022	--	13.19	--	-0.09	unconfined		--
S-434	9/22/2022	--	13.19	--	-0.09	unconfined		--
S-434	9/28/2022	--	13.40	--	-0.30	unconfined		--
S-434	10/13/2022	--	12.89	--	0.21	unconfined		--
S-434	10/20/2022	--	12.98	--	0.12	unconfined		--
S-434	10/27/2022	--	13.08	--	0.02	unconfined		--

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-434	11/1/2022	--	13.08	--	0.02	unconfined		--
S-434	11/10/2022	--	13.28	--	-0.18	unconfined		--
S-434	11/16/2022	--	13.22	--	-0.12	unconfined		--
S-434	11/22/2022	--	13.30	--	-0.20	unconfined		--
S-434	11/30/2022	--	13.31	--	-0.21	unconfined		--
S-434	12/14/2022	--	12.44	--	0.66	unconfined		--
S-434	12/21/2022	--	9.97	--	3.13	unconfined		--
S-434	12/28/2022	--	11.92	--	1.18	unconfined		--
S-434	1/3/2023	--	11.92	--	1.18	unconfined		--
S-434	1/10/2023	--	11.90	--	1.20	unconfined		--
S-434	1/19/2023	--	12.01	--	1.09	unconfined		--
S-434	1/26/2023	--	11.54	--	1.56	unconfined		--
S-434	1/31/2023	--	11.82	--	1.28	unconfined		--
S-434	2/7/2023	--	12.43	--	0.67	unconfined		--
S-434	2/16/2023	--	12.59	--	0.51	unconfined		--
S-434	2/28/2023	--	12.55	--	0.55	unconfined		--
S-434	3/7/2023	--	12.51	--	0.59	unconfined		--
S-434	3/16/2023	--	12.76	--	0.34	unconfined		--
S-434	3/23/2023	--	12.83	--	0.27	unconfined		--
S-434	3/29/2023	--	12.88	--	0.22	unconfined		--
S-434	4/5/2023	--	12.97	--	0.13	unconfined		--
S-434	4/13/2023	--	13.02	--	0.08	unconfined		--
S-434	4/19/2023	--	13.09	--	0.01	unconfined		--
S-434	4/26/2023	--	13.12	--	-0.02	unconfined		--
S-434	5/3/2023	--	11.95	--	1.15	unconfined		--
S-434	5/10/2023	--	12.41	--	0.69	unconfined		--
S-434	5/16/2023	--	12.62	--	0.48	unconfined		--
S-434	5/23/2023	--	12.85	--	0.25	unconfined		--
S-434	5/31/2023	--	12.98	--	0.12	unconfined		--
S-434	6/7/2023	--	13.03	--	0.07	unconfined		--
S-434	6/20/2023	--	13.18	--	-0.08	unconfined		--
S-434	6/27/2023	--	12.95	--	0.15	unconfined		--
S-434	7/19/2023	--	12.00	--	1.10	unconfined		--
S-434	7/26/2023	--	11.85	--	1.25	unconfined		--
S-434	8/2/2023	--	12.05	--	1.05	unconfined		--
S-434	8/9/2023	--	11.93	--	1.17	unconfined		--
S-434	8/23/2023	--	12.22	--	0.88	unconfined		--
S-434	8/30/2023	--	12.30	--	0.80	unconfined		--
S-434	9/5/2023	--	12.46	--	0.64	unconfined		--
S-434	9/15/2023	--	12.46	--	0.64	unconfined		--
S-434	9/20/2023	--	12.33	--	0.77	unconfined		--
S-434	9/27/2023	--	11.68	--	1.42	unconfined		--
S-434	10/4/2023	--	11.91	--	1.19	unconfined		--
S-434	10/17/2023	--	12.18	--	0.92	unconfined		--
S-434	10/26/2023	--	12.48	--	0.62	unconfined		--
S-434	11/1/2023	--	12.56	--	0.54	unconfined		--
S-434	11/9/2023	--	12.59	--	0.51	unconfined		--
S-434	11/13/2023	--	12.77	--	0.33	unconfined		--
S-434	11/22/2023	--	12.69	--	0.41	unconfined		--
S-434	11/29/2023	--	12.66	--	0.44	unconfined		--
S-434	12/14/2023	--	12.11	--	0.99	unconfined		--
S-434	12/20/2023	--	11.48	--	1.62	unconfined		--
S-434	1/3/2024	--	11.25	--	1.85	unconfined		--
S-434	1/11/2024	--	10.79	--	2.31	unconfined		--
S-434	1/18/2024	--	10.95	--	2.15	unconfined		--
S-434	1/24/2024	--	11.43	--	1.67	unconfined		--
S-434	1/30/2024	--	10.89	--	2.21	unconfined		--
S-434	2/5/2024	--	10.95	--	2.15	unconfined		--
S-434	2/15/2024	--	11.34	--	1.76	unconfined		--
S-434	2/21/2024	--	11.56	--	1.54	unconfined		--
S-434	2/28/2024	--	11.65	--	1.45	unconfined		--
S-434	3/5/2024	--	11.64	--	1.46	unconfined		--
S-434	3/20/2024	--	11.31	--	1.79	unconfined		--
S-434	3/28/2024	--	10.91	--	2.19	unconfined		--
S-434	4/3/2024	--	10.61	--	2.49	unconfined		--
S-434	4/9/2024	--	10.45	--	2.65	unconfined		--
S-434	4/25/2024	--	11.13	--	1.97	unconfined		--

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-434	4/30/2024	--	11.11	--	1.99	unconfined		--
S-434	5/8/2024	--	11.31	--	1.79	unconfined		--
S-434	5/20/2024	--	11.60	--	1.50	unconfined		--
S-434	5/31/2024	--	11.89	--	1.21	unconfined		--
S-434	6/5/2024	--	11.93	--	1.17	unconfined		--
S-434	6/12/2024	--	11.89	--	1.21	unconfined		--
S-434	6/19/2024	--	12.12	--	0.98	unconfined		--
S-434	6/26/2024	--	12.24	--	0.86	unconfined		--
S-434	7/2/2024	--	--	--	--	unconfined	Destroyed	--
S-435	4/17/2020	--	14.53	--	0.62	unconfined		--
S-435	6/5/2020	--	14.83	--	0.32	unconfined		--
S-435	1/25/2022	--	15.10	--	0.05	unconfined		--
S-435	2/8/2022	--	15.03	--	0.12	unconfined		--
S-435	2/14/2022	--	15.17	--	-0.02	unconfined		--
S-435	2/24/2022	--	15.23	--	-0.08	unconfined		--
S-435	2/28/2022	--	15.15	--	0.00	unconfined		--
S-435	3/17/2022	--	15.33	--	-0.18	unconfined		--
S-435	3/31/2022	--	15.04	--	0.11	unconfined		--
S-435	4/8/2022	--	15.14	--	0.01	unconfined		--
S-435	4/12/2022	--	14.40	--	0.75	unconfined		--
S-435	4/20/2022	--	14.52	--	0.63	unconfined		--
S-435	4/25/2022	--	14.48	--	0.67	unconfined		--
S-435	5/2/2022	--	14.65	--	0.50	unconfined		--
S-435	5/9/2022	--	14.39	--	0.76	unconfined		--
S-435	5/26/2022	--	14.52	--	0.63	unconfined		--
S-435	6/15/2022	--	14.27	--	0.88	unconfined		--
S-435	7/14/2022	--	14.72	--	0.43	unconfined		--
S-435	7/18/2022	--	14.75	--	0.40	unconfined		--
S-435	7/26/2022	--	14.95	--	0.20	unconfined		--
S-435	8/1/2022	--	15.02	--	0.13	unconfined		--
S-435	8/9/2022	--	15.14	--	0.01	unconfined		--
S-435	8/24/2022	--	15.16	--	-0.01	unconfined		--
S-435	8/29/2022	--	16.34	--	-1.19	unconfined		--
S-435	9/8/2022	--	16.24	--	-1.09	unconfined		--
S-435	9/22/2022	--	16.25	--	-1.10	unconfined		--
S-435	9/28/2022	--	16.35	--	-1.20	unconfined		--
S-435	10/13/2022	--	15.98	--	-0.83	unconfined		--
S-435	10/20/2022	--	16.08	--	-0.93	unconfined		--
S-435	10/27/2022	--	16.16	--	-1.01	unconfined		--
S-435	11/1/2022	--	16.18	--	-1.03	unconfined		--
S-435	11/10/2022	--	16.34	--	-1.19	unconfined		--
S-435	11/16/2022	--	16.35	--	-1.20	unconfined		--
S-435	11/22/2022	--	16.32	--	-1.17	unconfined		--
S-435	11/30/2022	--	16.41	--	-1.26	unconfined		--
S-435	12/14/2022	--	15.40	--	-0.25	unconfined		--
S-435	12/21/2022	--	11.91	--	3.24	unconfined		--
S-435	12/28/2022	--	14.92	--	0.23	unconfined		--
S-435	1/3/2023	--	14.88	--	0.27	unconfined		--
S-435	1/10/2023	--	14.83	--	0.32	unconfined		--
S-435	1/19/2023	--	14.91	--	0.24	unconfined		--
S-435	1/26/2023	--	14.79	--	0.36	unconfined		--
S-435	1/31/2023	--	15.02	--	0.13	unconfined		--
S-435	2/7/2023	--	15.54	--	-0.39	unconfined		--
S-435	2/16/2023	--	15.70	--	-0.55	unconfined		--
S-435	2/28/2023	--	15.71	--	-0.56	unconfined		--
S-435	3/7/2023	--	15.64	--	-0.49	unconfined		--
S-435	3/16/2023	--	15.88	--	-0.73	unconfined		--
S-435	3/23/2023	--	15.95	--	-0.80	unconfined		--
S-435	3/29/2023	--	15.98	--	-0.83	unconfined		--
S-435	4/5/2023	--	16.09	--	-0.94	unconfined		--
S-435	4/13/2023	--	16.13	--	-0.98	unconfined		--
S-435	4/19/2023	--	16.20	--	-1.05	unconfined		--
S-435	4/26/2023	--	16.23	--	-1.08	unconfined		--
S-435	5/3/2023	--	15.40	--	-0.25	unconfined		--
S-435	5/10/2023	--	15.60	--	-0.45	unconfined		--
S-435	5/16/2023	--	15.74	--	-0.59	unconfined		--
S-435	5/23/2023	--	15.98	--	-0.83	unconfined		--

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Well Gauging Summary, 2018 to Present
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Bellwether District Holdings, LLC, Philadelphia, PA

Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-435	5/31/2023	--	16.10	--	-0.95	unconfined		--
S-435	6/7/2023	--	16.10	--	-0.95	unconfined		--
S-435	6/20/2023	--	16.26	--	-1.11	unconfined		--
S-435	6/27/2023	--	16.10	--	-0.95	unconfined		--
S-435	7/19/2023	--	15.25	--	-0.10	unconfined		--
S-435	7/26/2023	--	15.02	--	0.13	unconfined		--
S-435	8/2/2023	--	15.14	--	0.01	unconfined		--
S-435	8/9/2023	--	15.10	--	0.05	unconfined		--
S-435	8/23/2023	--	15.32	--	-0.17	unconfined		--
S-435	8/30/2023	--	15.39	--	-0.24	unconfined		--
S-435	9/5/2023	--	15.57	--	-0.42	unconfined		--
S-435	9/15/2023	--	15.55	--	-0.40	unconfined		--
S-435	9/20/2023	--	15.37	--	-0.22	unconfined		--
S-435	9/27/2023	--	14.99	--	0.16	unconfined		--
S-435	10/4/2023	--	15.03	--	0.12	unconfined		--
S-435	10/17/2023	--	15.26	--	-0.11	unconfined		--
S-435	10/26/2023	--	15.55	--	-0.40	unconfined		--
S-435	11/1/2023	--	15.65	--	-0.50	unconfined		--
S-435	11/9/2023	--	15.71	--	-0.56	unconfined		--
S-435	11/13/2023	--	15.85	--	-0.70	unconfined		--
S-435	11/22/2023	--	15.84	--	-0.69	unconfined		--
S-435	11/29/2023	--	15.78	--	-0.63	unconfined		--
S-435	12/14/2023	--	15.40	--	-0.25	unconfined		--
S-435	12/20/2023	--	14.92	--	0.23	unconfined		--
S-435	1/3/2024	--	14.39	--	0.76	unconfined		--
S-435	1/11/2024	--	14.14	--	1.01	unconfined		--
S-435	1/18/2024	--	14.13	--	1.02	unconfined		--
S-435	1/24/2024	--	14.56	--	0.59	unconfined		--
S-435	1/30/2024	--	14.11	--	1.04	unconfined		--
S-435	2/5/2024	--	14.14	--	1.01	unconfined		--
S-435	2/15/2024	--	14.46	--	0.69	unconfined		--
S-435	2/21/2024	--	14.75	--	0.40	unconfined		--
S-435	2/28/2024	--	14.81	--	0.34	unconfined		--
S-435	3/5/2024	--	14.87	--	0.28	unconfined		--
S-435	3/20/2024	--	14.50	--	0.65	unconfined		--
S-435	3/28/2024	--	14.20	--	0.95	unconfined		--
S-435	4/3/2024	--	14.01	--	1.14	unconfined		--
S-435	4/9/2024	--	13.72	--	1.43	unconfined		--
S-435	4/25/2024	--	14.24	--	0.91	unconfined		--
S-435	4/30/2024	--	14.27	--	0.88	unconfined		--
S-435	5/8/2024	--	14.43	--	0.72	unconfined		--
S-435	5/20/2024	--	14.72	--	0.43	unconfined		--
S-435	5/31/2024	--	15.01	--	0.14	unconfined		--
S-435	6/5/2024	--	15.06	--	0.09	unconfined		--
S-435	6/12/2024	--	15.06	--	0.09	unconfined		--
S-435	6/19/2024	--	15.25	--	-0.10	unconfined		--
S-435	6/26/2024	--	15.37	--	-0.22	unconfined		--
S-435	7/2/2024	--	15.33	--	-0.18	unconfined		--
S-435	7/10/2024	--	15.13	--	0.02	unconfined		--
S-435	7/16/2024	--	15.03	--	0.12	unconfined		--
S-435	7/24/2024	--	15.34	--	-0.19	unconfined		--
S-435	8/1/2024	--	15.52	--	-0.37	unconfined		--
S-435	8/6/2024	--	15.17	--	-0.02	unconfined		--
S-435	8/28/2024	--	14.76	--	0.39	unconfined		--
S-435	9/4/2024	--	15.11	--	0.04	unconfined		--
S-435	9/11/2024	--	15.28	--	-0.13	unconfined		--
S-435	9/18/2024	--	15.43	--	-0.28	unconfined		--
S-435	9/25/2024	--	15.48	--	-0.33	unconfined		--
S-435	10/1/2024	--	15.55	--	-0.40	unconfined		--
S-435	10/14/2024	--	15.94	--	-0.79	unconfined		--
S-435	10/28/2024	--	16.33	--	-1.18	unconfined		--
S-435	11/8/2024	--	--	--	--	unconfined	Well abandoned	--
S-436	4/17/2020	--	13.21	--	0.69	unconfined		--
S-436	6/5/2020	--	13.59	--	0.31	unconfined		--
S-436	1/25/2022	--	13.84	--	0.06	unconfined		--
S-436	2/8/2022	--	13.72	--	0.18	unconfined		--
S-436	2/14/2022	--	13.83	--	0.07	unconfined		--

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-436	2/24/2022	--	13.94	--	-0.04	unconfined		--
S-436	2/28/2022	--	13.82	--	0.08	unconfined		--
S-436	3/17/2022	--	14.03	--	-0.13	unconfined		--
S-436	3/31/2022	--	13.76	--	0.14	unconfined		--
S-436	4/8/2022	--	13.84	--	0.06	unconfined		--
S-436	4/12/2022	--	12.92	--	0.98	unconfined		--
S-436	4/20/2022	--	13.14	--	0.76	unconfined		--
S-436	4/25/2022	--	13.12	--	0.78	unconfined		--
S-436	5/2/2022	--	13.34	--	0.56	unconfined		--
S-436	5/9/2022	--	13.07	--	0.83	unconfined		--
S-436	5/26/2022	--	13.20	--	0.70	unconfined		--
S-436	6/15/2022	--	12.97	--	0.93	unconfined		--
S-436	7/14/2022	--	13.45	--	0.45	unconfined		--
S-436	7/18/2022	--	13.51	--	0.39	unconfined		--
S-436	7/26/2022	--	13.69	--	0.21	unconfined		--
S-436	8/1/2022	--	13.80	--	0.10	unconfined		--
S-436	8/9/2022	--	13.91	--	-0.01	unconfined		--
S-436	8/24/2022	--	13.94	--	-0.04	unconfined		--
S-436	8/29/2022	--	14.03	--	-0.13	unconfined		--
S-436	9/8/2022	--	13.98	--	-0.08	unconfined		--
S-436	9/22/2022	--	13.98	--	-0.08	unconfined		--
S-436	9/28/2022	--	14.17	--	-0.27	unconfined		--
S-436	10/13/2022	--	13.70	--	0.20	unconfined		--
S-436	10/20/2022	--	13.77	--	0.13	unconfined		--
S-436	10/27/2022	--	13.85	--	0.05	unconfined		--
S-436	11/1/2022	--	13.88	--	0.02	unconfined		--
S-436	11/10/2022	--	14.04	--	-0.14	unconfined		--
S-436	11/16/2022	--	14.05	--	-0.15	unconfined		--
S-436	11/22/2022	--	14.08	--	-0.18	unconfined		--
S-436	11/30/2022	--	14.11	--	-0.21	unconfined		--
S-436	12/14/2022	--	13.28	--	0.62	unconfined		--
S-436	12/21/2022	--	14.95	--	-1.05	unconfined		--
S-436	12/28/2022	--	12.76	--	1.14	unconfined		--
S-436	1/3/2023	--	12.75	--	1.15	unconfined		--
S-436	1/10/2023	--	12.70	--	1.20	unconfined		--
S-436	1/19/2023	--	12.80	--	1.10	unconfined		--
S-436	1/26/2023	--	12.42	--	1.48	unconfined		--
S-436	1/31/2023	--	12.65	--	1.25	unconfined		--
S-436	2/7/2023	--	13.18	--	0.72	unconfined		--
S-436	2/16/2023	--	13.37	--	0.53	unconfined		--
S-436	2/28/2023	--	13.35	--	0.55	unconfined		--
S-436	3/7/2023	--	13.29	--	0.61	unconfined		--
S-436	3/16/2023	--	13.56	--	0.34	unconfined		--
S-436	3/23/2023	--	13.60	--	0.30	unconfined		--
S-436	3/29/2023	--	13.65	--	0.25	unconfined		--
S-436	4/5/2023	--	13.78	--	0.12	unconfined		--
S-436	4/13/2023	--	13.80	--	0.10	unconfined		--
S-436	4/19/2023	--	13.86	--	0.04	unconfined		--
S-436	4/26/2023	--	13.91	--	-0.01	unconfined		--
S-436	5/3/2023	--	12.83	--	1.07	unconfined		--
S-436	5/10/2023	--	13.22	--	0.68	unconfined		--
S-436	5/16/2023	--	13.43	--	0.47	unconfined		--
S-436	5/23/2023	--	13.64	--	0.26	unconfined		--
S-436	5/31/2023	--	13.78	--	0.12	unconfined		--
S-436	6/7/2023	--	--	--	--	unconfined	Well abandoned	--
S-437	1/21/2020	20.81	21.48	0.67	-0.14	unconfined		0.74
S-437	4/17/2020	19.98	21.80	1.82	0.39	unconfined		0.74
S-437	5/12/2020	20.25	22.09	1.84	0.12	unconfined		0.74
S-437	5/14/2020	20.26	22.14	1.88	0.10	unconfined		0.74
S-437	5/19/2020	20.23	22.04	1.81	0.15	unconfined		0.74
S-437	5/21/2020	20.30	21.35	1.05	0.27	unconfined		0.74
S-437	5/26/2020	20.20	22.04	1.84	0.17	unconfined		0.74
S-437	5/28/2020	20.19	22.04	1.85	0.18	unconfined		0.74
S-437	6/1/2020	20.21	22.08	1.87	0.15	unconfined		0.74
S-437	6/5/2020	20.16	21.99	1.83	0.21	unconfined		0.74
S-437	6/8/2020	21.17	22.06	0.89	-0.55	unconfined		0.74
S-437	6/11/2020	20.04	22.92	2.88	0.06	unconfined		0.74

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-437	6/16/2020	20.21	21.07	0.86	0.41	unconfined		0.74
S-437	6/19/2020	20.16	22.00	1.84	0.21	unconfined		0.74
S-437	6/22/2020	20.21	22.17	1.96	0.13	unconfined		0.74
S-437	6/26/2020	21.24	22.14	0.90	-0.63	unconfined		0.74
S-437	7/1/2020	20.21	22.09	1.88	0.15	unconfined		0.74
S-437	7/7/2020	20.31	22.19	1.88	0.05	unconfined		0.74
S-437	7/9/2020	20.22	22.09	1.87	0.14	unconfined		0.74
S-437	7/9/2020	20.31	22.19	1.88	0.05	unconfined		0.74
S-437	7/14/2020	19.83	21.76	1.93	0.51	unconfined		0.74
S-437	7/17/2020	19.96	20.71	0.75	0.69	unconfined		0.74
S-437	7/22/2020	20.06	21.85	1.79	0.32	unconfined		0.74
S-437	7/24/2020	20.05	21.79	1.74	0.34	unconfined		0.74
S-437	7/28/2020	20.14	21.93	1.79	0.24	unconfined		0.74
S-437	7/30/2020	20.19	21.99	1.80	0.19	unconfined		0.74
S-437	8/4/2020	20.19	22.06	1.87	0.17	unconfined		0.74
S-437	8/6/2020	19.92	21.77	1.85	0.45	unconfined		0.74
S-437	8/13/2020	19.65	21.48	1.83	0.72	unconfined		0.74
S-437	8/18/2020	19.70	22.49	2.79	0.42	unconfined		0.74
S-437	8/20/2020	20.79	21.54	0.75	-0.14	unconfined		0.74
S-437	8/25/2020	19.82	21.59	1.77	0.57	unconfined		0.74
S-437	8/27/2020	19.81	21.59	1.78	0.57	unconfined		0.74
S-437	9/1/2020	19.99	21.74	1.75	0.40	unconfined		0.74
S-437	9/3/2020	20.01	21.75	1.74	0.38	unconfined		0.74
S-437	9/11/2020	20.05	21.80	1.75	0.34	unconfined		0.74
S-437	9/16/2020	22.08	23.79	1.71	-1.68	unconfined		0.74
S-437	9/18/2020	21.25	23.21	1.96	-0.91	unconfined		0.74
S-437	9/22/2020	20.11	21.91	1.80	0.27	unconfined		0.74
S-437	9/24/2020	20.11	21.99	1.88	0.25	unconfined		0.74
S-437	9/28/2020	20.25	22.07	1.82	0.12	unconfined		0.74
S-437	10/1/2020	20.17	21.20	1.03	0.41	unconfined		0.74
S-437	10/8/2020	20.02	21.94	1.92	0.33	unconfined		0.74
S-437	10/9/2020	20.26	22.15	1.89	0.09	unconfined		0.74
S-437	10/12/2020	20.26	22.09	1.83	0.11	unconfined		0.74
S-437	10/19/2020	20.20	21.98	1.78	0.18	unconfined		0.74
S-437	10/23/2020	20.22	21.99	1.77	0.17	unconfined		0.74
S-437	10/27/2020	20.30	22.04	1.74	0.09	unconfined		0.74
S-437	10/30/2020	20.26	22.04	1.78	0.12	unconfined		0.74
S-437	11/2/2020	20.42	21.84	1.42	0.06	unconfined		0.74
S-437	11/9/2020	20.21	21.89	1.68	0.20	unconfined		0.74
S-437	11/10/2020	20.21	21.99	1.78	0.17	unconfined		0.74
S-437	11/16/2020	20.01	21.73	1.72	0.39	unconfined		0.74
S-437	11/23/2020	19.95	21.68	1.73	0.45	unconfined		0.74
S-437	11/25/2020	20.49	21.58	1.09	0.07	unconfined		0.74
S-437	11/30/2020	19.92	21.61	1.69	0.49	unconfined		0.74
S-437	12/4/2020	19.98	21.63	1.65	0.44	unconfined		0.74
S-437	12/8/2020	19.89	21.53	1.64	0.53	unconfined		0.74
S-437	12/11/2020	19.89	21.51	1.62	0.54	unconfined		0.74
S-437	12/14/2020	19.91	21.54	1.63	0.51	unconfined		0.74
S-437	12/18/2020	19.95	21.51	1.56	0.49	unconfined		0.74
S-437	12/21/2020	19.77	21.41	1.64	0.65	unconfined		0.74
S-437	12/28/2020	19.34	21.13	1.79	1.04	unconfined		0.74
S-437	12/31/2020	19.53	21.21	1.68	0.88	unconfined		0.74
S-437	1/4/2021	19.47	21.07	1.60	0.96	unconfined		0.74
S-437	1/8/2021	19.38	20.97	1.59	1.05	unconfined		0.74
S-437	1/15/2021	19.52	21.11	1.59	0.91	unconfined		0.74
S-437	3/12/2021	19.73	21.26	1.53	0.72	unconfined		0.74
S-437	3/15/2021	19.90	21.47	1.57	0.54	unconfined		0.74
S-437	4/7/2021	19.44	21.93	2.49	0.76	unconfined		0.74
S-437	4/23/2021	19.73	21.11	1.38	0.76	unconfined		0.74
S-437	5/3/2021	19.64	21.02	1.38	0.85	unconfined		0.74
S-437	5/6/2021	19.83	21.18	1.35	0.67	unconfined		0.74
S-437	5/11/2021	19.87	21.26	1.39	0.62	unconfined		0.74
S-437	5/14/2021	19.93	21.35	1.42	0.55	unconfined		0.74
S-437	5/20/2021	20.03	21.36	1.33	0.47	unconfined		0.74
S-437	5/25/2021	20.03	21.38	1.35	0.47	unconfined		0.74
S-437	6/3/2021	19.76	21.06	1.30	0.75	unconfined		0.74
S-437	6/4/2021	19.73	21.05	1.32	0.77	unconfined		0.74

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UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC, Philadelphia, PA

Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-437	6/14/2021	19.62	21.96	2.34	0.62	unconfined		0.74
S-437	6/18/2021	19.34	20.72	1.38	1.15	unconfined		0.74
S-437	6/22/2021	19.47	20.79	1.32	1.03	unconfined		0.74
S-437	6/23/2021	19.34	20.72	1.38	1.15	unconfined		0.74
S-437	6/24/2021	19.75	21.01	1.26	0.77	unconfined		0.74
S-437	6/29/2021	19.75	21.01	1.26	0.77	unconfined		0.74
S-437	7/1/2021	19.82	21.22	1.40	0.66	unconfined		0.74
S-437	7/6/2021	19.63	20.91	1.28	0.88	unconfined		0.74
S-437	7/9/2021	19.70	21.08	1.38	0.79	unconfined		0.74
S-437	7/13/2021	19.74	21.04	1.30	0.77	unconfined		0.74
S-437	7/20/2021	19.40	20.71	1.31	1.11	unconfined		0.74
S-437	7/23/2021	19.55	20.84	1.29	0.96	unconfined		0.74
S-437	7/27/2021	19.56	20.90	1.34	0.94	unconfined		0.74
S-437	7/30/2021	19.53	20.82	1.29	0.98	unconfined		0.74
S-437	8/3/2021	19.76	21.07	1.31	0.75	unconfined		0.74
S-437	8/10/2021	19.84	21.18	1.34	0.66	unconfined		0.74
S-437	8/13/2021	19.81	21.15	1.34	0.69	unconfined		0.74
S-437	8/20/2021	19.85	21.27	1.42	0.63	unconfined		0.74
S-437	8/24/2021	19.73	21.02	1.29	0.78	unconfined		0.74
S-437	8/27/2021	19.67	20.96	1.29	0.84	unconfined		0.74
S-437	9/3/2021	19.11	20.40	1.29	1.40	unconfined		0.74
S-437	9/10/2021	19.25	20.48	1.23	1.28	unconfined		0.74
S-437	9/16/2021	19.46	20.75	1.29	1.05	unconfined		0.74
S-437	9/22/2021	19.44	20.73	1.29	1.07	unconfined		0.74
S-437	9/24/2021	19.33	20.57	1.24	1.20	unconfined		0.74
S-437	9/29/2021	19.40	20.63	1.23	1.13	unconfined		0.74
S-437	10/5/2021	19.59	20.89	1.30	0.92	unconfined		0.74
S-437	10/14/2021	19.38	20.62	1.24	1.15	unconfined		0.74
S-437	10/21/2021	19.67	21.08	1.41	0.81	unconfined		0.74
S-437	10/28/2021	19.54	20.76	1.22	0.99	unconfined		0.74
S-437	11/4/2021	19.56	20.84	1.28	0.95	unconfined		0.74
S-437	11/11/2021	19.61	20.91	1.30	0.90	unconfined		0.74
S-437	11/18/2021	19.79	21.16	1.37	0.70	unconfined		0.74
S-437	11/24/2021	20.04	21.43	1.39	0.45	unconfined		0.74
S-437	12/22/2021	20.35	21.73	1.38	0.14	unconfined		0.74
S-437	12/30/2021	20.31	21.61	1.30	0.20	unconfined		0.74
S-437	1/4/2022	20.40	20.74	0.34	0.36	unconfined		0.74
S-437	1/12/2022	20.47	21.79	1.32	0.03	unconfined		0.74
S-437	1/25/2022	20.40	21.77	1.37	0.09	unconfined		0.74
S-437	2/8/2022	20.52	20.81	0.29	0.25	unconfined		0.74
S-437	2/14/2022	20.69	22.08	1.39	-0.20	unconfined		0.74
S-437	2/24/2022	20.67	22.00	1.33	-0.17	unconfined		0.74
S-437	2/28/2022	20.75	22.15	1.40	-0.27	unconfined		0.74
S-437	3/17/2022	20.91	22.38	1.47	-0.45	unconfined		0.74
S-437	3/24/2022	20.71	20.98	0.27	0.07	unconfined		0.74
S-437	3/31/2022	20.68	22.96	2.28	-0.43	unconfined		0.74
S-437	4/8/2022	20.66	21.95	1.29	-0.15	unconfined		0.74
S-437	4/12/2022	20.04	21.34	1.30	0.47	unconfined		0.74
S-437	4/20/2022	20.05	21.25	1.20	0.49	unconfined		0.74
S-437	4/25/2022	20.02	21.17	1.15	0.53	unconfined		0.74
S-437	5/2/2022	20.19	21.31	1.12	0.37	unconfined		0.74
S-437	5/9/2022	19.96	21.05	1.09	0.60	unconfined		0.74
S-437	5/26/2022	20.02	21.19	1.17	0.52	unconfined		0.74
S-437	6/15/2022	19.74	20.95	1.21	0.79	unconfined		0.74
S-437	7/14/2022	20.15	21.41	1.26	0.37	unconfined		0.74
S-437	7/18/2022	20.12	21.37	1.25	0.40	unconfined		0.74
S-437	7/26/2022	20.34	21.67	1.33	0.16	unconfined		0.74
S-437	8/1/2022	20.36	21.69	1.33	0.14	unconfined		0.74
S-437	8/9/2022	20.51	21.85	1.34	-0.01	unconfined		0.74
S-437	8/24/2022	20.47	21.74	1.27	0.05	unconfined		0.74
S-437	8/29/2022	20.54	21.82	1.28	-0.03	unconfined		0.74
S-437	9/8/2022	20.51	21.75	1.24	0.02	unconfined		0.74
S-437	9/22/2022	20.51	21.70	1.19	0.03	unconfined		0.74
S-437	9/28/2022	20.75	22.05	1.30	-0.24	unconfined		0.74
S-437	10/5/2022	20.19	22.28	2.09	0.11	unconfined		0.74
S-437	10/13/2022	20.35	21.43	1.08	0.22	unconfined		0.74
S-437	10/20/2022	20.46	21.50	1.04	0.12	unconfined		0.74

Table 3-2
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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-437	10/27/2022	20.53	21.55	1.02	0.05	unconfined		0.74
S-437	11/1/2022	20.50	21.52	1.02	0.08	unconfined		0.74
S-437	11/10/2022	20.72	21.82	1.10	-0.16	unconfined		0.74
S-437	11/16/2022	20.70	21.73	1.03	-0.12	unconfined		0.74
S-437	11/22/2022	20.88	22.00	1.12	-0.32	unconfined		0.74
S-437	11/30/2022	20.75	21.83	1.08	-0.18	unconfined		0.74
S-437	12/14/2022	19.46	20.20	0.74	1.20	unconfined		0.74
S-437	12/28/2022	19.18	19.80	0.62	1.51	unconfined		0.74
S-437	1/3/2023	19.15	19.71	0.56	1.55	unconfined		0.74
S-437	1/10/2023	19.12	19.59	0.47	1.61	unconfined		0.74
S-437	1/19/2023	19.15	19.59	0.44	1.58	unconfined		0.74
S-437	1/26/2023	19.43	19.90	0.47	1.30	unconfined		0.74
S-437	1/31/2023	19.79	20.19	0.40	0.96	unconfined		0.74
S-437	2/7/2023	20.42	20.68	0.26	0.36	unconfined		0.74
S-437	2/16/2023	20.34	20.70	0.36	0.42	unconfined		0.74
S-437	2/28/2023	20.25	20.70	0.45	0.48	unconfined		0.74
S-437	3/7/2023	20.30	20.73	0.43	0.44	unconfined		0.74
S-437	3/16/2023	20.49	21.02	0.53	0.22	unconfined		0.74
S-437	3/23/2023	20.53	21.11	0.58	0.17	unconfined		0.74
S-437	3/29/2023	20.55	21.05	0.50	0.17	unconfined		0.74
S-437	4/5/2023	20.69	21.24	0.55	0.02	unconfined		0.74
S-437	4/13/2023	20.66	21.21	0.55	0.05	unconfined		0.74
S-437	4/19/2023	20.71	21.28	0.57	-0.01	unconfined		0.74
S-437	4/26/2023	20.70	21.32	0.62	-0.01	unconfined		0.74
S-437	5/3/2023	20.01	20.35	0.34	0.75	unconfined	Data logger installed	0.74
S-437	5/10/2023	20.34	20.45	0.11	0.48	unconfined		0.74
S-437	5/16/2023	20.59	20.61	0.02	0.25	unconfined		0.74
S-437	5/23/2023	20.66	20.70	0.04	0.18	unconfined		0.74
S-437	5/31/2023	20.73	20.95	0.22	0.06	unconfined		0.74
S-437	6/7/2023	--	20.76	--	0.09	unconfined		0.74
S-437	6/20/2023	20.88	21.10	0.22	-0.09	unconfined		0.74
S-437	6/27/2023	20.78	20.83	0.05	0.06	unconfined		0.74
S-437	7/19/2023	--	19.90	--	0.95	unconfined		0.74
S-437	7/26/2023	19.69	19.75	0.06	1.14	unconfined		0.74
S-437	8/2/2023	19.90	20.02	0.12	0.92	unconfined		0.74
S-437	8/9/2023	19.79	19.81	0.02	1.05	unconfined		0.74
S-437	9/5/2023	20.25	20.36	0.11	0.57	unconfined		0.74
S-437	9/15/2023	20.23	20.30	0.07	0.60	unconfined		0.74
S-437	9/20/2023	20.20	20.26	0.06	0.63	unconfined		0.74
S-437	9/27/2023	--	19.63	--	1.22	unconfined		0.74
S-437	10/4/2023	19.72	19.74	0.02	1.12	unconfined		0.74
S-437	10/17/2023	19.94	20.02	0.08	0.89	unconfined		0.74
S-437	10/26/2023	20.28	20.31	0.03	0.56	unconfined		0.74
S-437	11/1/2023	20.31	20.35	0.04	0.53	unconfined		0.74
S-437	11/9/2023	20.30	20.32	0.02	0.54	unconfined		0.74
S-437	11/13/2023	20.56	20.59	0.03	0.28	unconfined		0.74
S-437	11/22/2023	--	20.36	--	0.49	unconfined		0.74
S-437	11/29/2023	20.58	20.60	0.02	0.26	unconfined		0.74
S-437	12/14/2023	20.15	20.17	0.02	0.69	unconfined		0.74
S-437	12/20/2023	--	19.29	--	1.56	unconfined		0.74
S-437	1/3/2024	--	19.05	--	1.80	unconfined		0.74
S-437	1/11/2024	--	18.62	--	2.23	unconfined		0.74
S-437	1/18/2024	--	18.76	--	2.09	unconfined		0.74
S-437	1/24/2024	--	19.33	--	1.52	unconfined		0.74
S-437	1/30/2024	--	18.90	--	1.95	unconfined		0.74
S-437	2/5/2024	--	18.80	--	2.05	unconfined		0.74
S-437	2/15/2024	--	19.35	--	1.50	unconfined		0.74
S-437	2/21/2024	--	19.58	--	1.27	unconfined		0.74
S-437	2/28/2024	--	19.52	--	1.33	unconfined		0.74
S-437	3/5/2024	--	19.60	--	1.25	unconfined		0.74
S-437	3/20/2024	--	19.27	--	1.58	unconfined		0.74
S-437	3/28/2024	--	18.79	--	2.06	unconfined		0.74
S-437	4/3/2024	--	18.84	--	2.01	unconfined		0.74
S-437	4/9/2024	--	18.41	--	2.44	unconfined		0.74
S-437	4/25/2024	--	19.00	--	1.85	unconfined		0.74
S-437	4/30/2024	--	18.97	--	1.88	unconfined		0.74
S-437	5/8/2024	--	19.21	--	1.64	unconfined		0.74

Table 3-2
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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-437	5/20/2024	--	19.46	--	1.39	unconfined		0.74
S-437	5/31/2024	--	19.75	--	1.10	unconfined		0.74
S-437	6/5/2024	19.88	19.89	0.01	0.97	unconfined		0.74
S-437	6/12/2024	--	19.80	--	1.05	unconfined		0.74
S-437	6/19/2024	19.98	19.99	0.01	0.87	unconfined		0.74
S-437	6/26/2024	20.11	20.12	0.01	0.74	unconfined		0.74
S-437	7/2/2024	--	19.98	--	0.87	unconfined		0.74
S-437	7/10/2024	--	19.68	--	1.17	unconfined		0.74
S-437	7/16/2024	--	19.80	--	1.05	unconfined		0.74
S-437	7/24/2024	--	20.02	--	0.83	unconfined		0.74
S-437	8/1/2024	--	20.25	--	0.60	unconfined		0.74
S-437	8/6/2024	--	20.24	--	0.61	unconfined		0.74
S-437	8/23/2024	--	19.47	--	1.38	unconfined		0.74
S-437	8/28/2024	--	19.59	--	1.26	unconfined		0.74
S-437	9/4/2024	--	19.91	--	0.94	unconfined		0.74
S-437	9/11/2024	--	20.05	--	0.80	unconfined		0.74
S-437	9/18/2024	--	20.10	--	0.75	unconfined		0.74
S-437	9/25/2024	--	20.03	--	0.82	unconfined		0.74
S-437	10/1/2024	--	20.15	--	0.70	unconfined		0.74
S-437	10/14/2024	--	20.54	--	0.31	unconfined		0.74
S-437	10/28/2024	--	20.89	--	-0.04	unconfined		0.74
S-437	11/8/2024	--	21.10	--	-0.25	unconfined		0.74
S-437	11/15/2024	--	21.08	--	-0.23	unconfined		0.74
S-437	11/20/2024	--	21.11	--	-0.26	unconfined		0.74
S-437	11/26/2024	--	21.16	--	-0.31	unconfined		0.74
S-437	12/4/2024	--	21.25	--	-0.40	unconfined		0.74
S-437	12/11/2024	--	21.20	--	-0.35	unconfined		0.74
S-437	12/17/2024	--	21.06	--	-0.21	unconfined		0.74
S-437	1/8/2025	--	20.92	--	-0.07	unconfined		0.74
S-437	1/16/2025	--	21.18	--	-0.33	unconfined		0.74
S-437	1/24/2025	21.29	21.30	0.01	-0.44	unconfined		0.74
S-437	1/29/2025	21.37	21.38	0.01	-0.52	unconfined		0.74
S-437	2/5/2025	--	21.41	--	-0.56	unconfined		0.74
S-437	2/12/2025	--	21.45	--	-0.60	unconfined		0.74
S-437	2/20/2025	--	--	--	--	unconfined	Unable to access	0.74
S-438	1/14/2020	20.85	22.42	1.57	-0.02	unconfined		0.73
S-438	1/21/2020	20.91	22.42	1.51	-0.06	unconfined		0.73
S-438	4/17/2020	20.41	21.72	1.31	0.49	unconfined		0.73
S-438	5/12/2020	20.57	22.10	1.53	0.27	unconfined		0.73
S-438	5/14/2020	20.52	22.14	1.62	0.30	unconfined		0.73
S-438	5/19/2020	20.63	22.08	1.45	0.23	unconfined		0.73
S-438	5/21/2020	20.67	22.06	1.39	0.21	unconfined		0.73
S-438	5/26/2020	20.91	21.95	1.04	0.07	unconfined		0.73
S-438	5/28/2020	20.61	21.91	1.30	0.29	unconfined		0.73
S-438	6/1/2020	20.71	21.18	0.47	0.42	unconfined		0.73
S-438	6/5/2020	20.57	21.90	1.33	0.33	unconfined		0.73
S-438	6/8/2020	20.56	21.87	1.31	0.34	unconfined		0.73
S-438	6/11/2020	20.49	21.71	1.22	0.44	unconfined		0.73
S-438	6/16/2020	20.58	21.91	1.33	0.32	unconfined		0.73
S-438	6/19/2020	20.55	21.85	1.30	0.35	unconfined		0.73
S-438	6/22/2020	20.70	22.03	1.33	0.20	unconfined		0.73
S-438	6/26/2020	20.61	21.97	1.36	0.28	unconfined		0.73
S-438	7/1/2020	20.66	22.06	1.40	0.22	unconfined		0.73
S-438	7/7/2020	20.74	22.11	1.37	0.15	unconfined		0.73
S-438	7/9/2020	20.74	22.03	1.29	0.17	unconfined		0.73
S-438	7/9/2020	20.74	22.11	1.37	0.15	unconfined		0.73
S-438	7/14/2020	20.29	21.39	1.10	0.67	unconfined		0.73
S-438	7/17/2020	20.37	21.55	1.18	0.57	unconfined		0.73
S-438	7/22/2020	20.49	21.89	1.40	0.39	unconfined		0.73
S-438	7/24/2020	20.46	20.95	0.49	0.67	unconfined		0.73
S-438	7/28/2020	20.58	21.92	1.34	0.31	unconfined		0.73
S-438	7/30/2020	20.61	21.98	1.37	0.28	unconfined		0.73
S-438	8/6/2020	20.32	21.35	1.03	0.66	unconfined		0.73
S-438	8/13/2020	20.46	21.21	0.75	0.59	unconfined		0.73
S-438	8/18/2020	19.47	22.49	3.02	0.96	unconfined		0.73
S-438	8/20/2020	20.16	21.36	1.20	0.77	unconfined		0.73
S-438	8/25/2020	20.22	21.51	1.29	0.69	unconfined		0.73

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S-438	8/27/2020	20.31	21.61	1.30	0.59	unconfined		0.73
S-438	9/1/2020	20.41	21.73	1.32	0.49	unconfined		0.73
S-438	9/3/2020	20.34	21.61	1.27	0.57	unconfined		0.73
S-438	9/11/2020	20.76	22.25	1.49	0.09	unconfined		0.73
S-438	9/16/2020	20.52	21.84	1.32	0.38	unconfined		0.73
S-438	9/18/2020	20.15	20.68	0.53	0.97	unconfined		0.73
S-438	9/22/2020	20.55	21.84	1.29	0.36	unconfined		0.73
S-438	9/24/2020	20.52	21.77	1.25	0.40	unconfined		0.73
S-438	9/28/2020	20.62	21.98	1.36	0.27	unconfined		0.73
S-438	10/1/2020	20.53	21.48	0.95	0.47	unconfined		0.73
S-438	10/8/2020	20.52	21.69	1.17	0.42	unconfined		0.73
S-438	10/9/2020	20.64	22.01	1.37	0.25	unconfined		0.73
S-438	10/12/2020	20.72	22.04	1.32	0.18	unconfined		0.73
S-438	10/19/2020	20.65	21.62	0.97	0.34	unconfined		0.73
S-438	10/23/2020	20.64	21.61	0.97	0.35	unconfined		0.73
S-438	10/27/2020	20.69	21.64	0.95	0.31	unconfined		0.73
S-438	10/30/2020	20.86	21.84	0.98	0.13	unconfined		0.73
S-438	11/2/2020	20.51	21.50	0.99	0.48	unconfined		0.73
S-438	11/9/2020	20.68	21.84	1.16	0.26	unconfined		0.73
S-438	11/10/2020	20.71	21.80	1.09	0.25	unconfined		0.73
S-438	11/16/2020	20.39	21.38	0.99	0.60	unconfined		0.73
S-438	11/19/2020	20.46	21.50	1.04	0.52	unconfined		0.73
S-438	11/23/2020	20.43	21.54	1.11	0.53	unconfined		0.73
S-438	11/30/2020	20.47	21.58	1.11	0.49	unconfined		0.73
S-438	12/4/2020	20.38	21.44	1.06	0.59	unconfined		0.73
S-438	12/8/2020	20.36	21.39	1.03	0.62	unconfined		0.73
S-438	12/11/2020	20.39	21.43	1.04	0.59	unconfined		0.73
S-438	12/14/2020	20.30	21.35	1.05	0.67	unconfined		0.73
S-438	12/18/2020	20.35	21.39	1.04	0.63	unconfined		0.73
S-438	12/21/2020	20.22	21.26	1.04	0.76	unconfined		0.73
S-438	12/28/2020	19.86	20.70	0.84	1.17	unconfined		0.73
S-438	12/31/2020	19.95	20.84	0.89	1.07	unconfined		0.73
S-438	1/4/2021	19.82	20.79	0.97	1.17	unconfined		0.73
S-438	1/8/2021	19.78	20.64	0.86	1.24	unconfined		0.73
S-438	1/15/2021	19.91	20.98	1.07	1.06	unconfined		0.73
S-438	1/25/2021	20.42	21.64	1.22	0.51	unconfined		0.73
S-438	1/29/2021	20.50	21.68	1.18	0.44	unconfined		0.73
S-438	2/3/2021	20.40	21.10	0.70	0.67	unconfined		0.73
S-438	2/5/2021	20.45	20.90	0.45	0.69	unconfined		0.73
S-438	2/12/2021	20.43	20.90	0.47	0.70	unconfined		0.73
S-438	2/17/2021	20.48	20.49	0.01	0.78	unconfined		0.73
S-438	3/5/2021	19.87	20.71	0.84	1.16	unconfined		0.73
S-438	3/19/2021	20.11	21.06	0.95	0.89	unconfined		0.73
S-438	4/23/2021	19.98	21.05	1.07	0.99	unconfined		0.73
S-438	5/3/2021	19.98	20.90	0.92	1.03	unconfined		0.73
S-438	5/6/2021	20.13	21.06	0.93	0.88	unconfined		0.73
S-438	5/11/2021	20.10	21.15	1.05	0.87	unconfined		0.73
S-438	5/14/2021	20.21	21.38	1.17	0.73	unconfined		0.73
S-438	5/20/2021	20.31	21.40	1.09	0.65	unconfined		0.73
S-438	5/25/2021	20.36	21.43	1.07	0.61	unconfined		0.73
S-438	6/3/2021	20.03	20.97	0.94	0.97	unconfined		0.73
S-438	6/4/2021	20.02	20.97	0.95	0.98	unconfined		0.73
S-438	6/14/2021	19.92	20.72	0.80	1.12	unconfined		0.73
S-438	6/18/2021	19.68	20.35	0.67	1.40	unconfined		0.73
S-438	6/22/2021	19.79	20.60	0.81	1.25	unconfined		0.73
S-438	6/23/2021	19.68	20.35	0.67	1.40	unconfined		0.73
S-438	6/24/2021	19.07	20.95	1.88	1.68	unconfined		0.73
S-438	6/24/2021	19.07	20.95	1.88	1.68	unconfined		0.73
S-438	6/29/2021	19.07	20.95	1.88	1.68	unconfined		0.73
S-438	7/1/2021	20.07	21.08	1.01	0.91	unconfined		0.73
S-438	7/6/2021	19.91	20.73	0.82	1.13	unconfined		0.73
S-438	7/9/2021	20.02	22.71	2.69	0.50	unconfined		0.73
S-438	7/13/2021	19.96	20.78	0.82	1.08	unconfined		0.73
S-438	7/20/2021	20.45	21.27	0.82	0.59	unconfined		0.73
S-438	7/23/2021	19.85	20.60	0.75	1.20	unconfined		0.73
S-438	7/27/2021	19.87	20.67	0.80	1.17	unconfined		0.73
S-438	7/30/2021	19.89	20.76	0.87	1.13	unconfined		0.73

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-438	8/3/2021	20.05	21.05	1.00	0.94	unconfined		0.73
S-438	8/10/2021	20.14	21.13	0.99	0.85	unconfined		0.73
S-438	8/13/2021	20.13	21.10	0.97	0.86	unconfined		0.73
S-438	8/20/2021	20.18	21.18	1.00	0.81	unconfined		0.73
S-438	8/24/2021	20.07	20.86	0.79	0.97	unconfined		0.73
S-438	8/27/2021	20.05	20.86	0.81	0.99	unconfined		0.73
S-438	9/3/2021	19.48	19.95	0.47	1.65	unconfined		0.73
S-438	9/10/2021	19.63	20.22	0.59	1.47	unconfined		0.73
S-438	9/16/2021	19.84	20.63	0.79	1.20	unconfined		0.73
S-438	9/22/2021	19.83	20.62	0.79	1.21	unconfined		0.73
S-438	9/24/2021	19.72	20.31	0.59	1.38	unconfined		0.73
S-438	9/29/2021	19.78	20.52	0.74	1.28	unconfined		0.73
S-438	10/5/2021	19.88	20.73	0.85	1.15	unconfined		0.73
S-438	10/14/2021	19.77	20.52	0.75	1.28	unconfined		0.73
S-438	10/21/2021	20.00	20.97	0.97	0.99	unconfined		0.73
S-438	10/28/2021	19.85	20.54	0.69	1.22	unconfined		0.73
S-438	11/4/2021	19.87	20.17	0.30	1.31	unconfined		0.73
S-438	11/11/2021	19.97	20.88	0.91	1.04	unconfined		0.73
S-438	11/18/2021	20.13	21.13	1.00	0.86	unconfined		0.73
S-438	11/24/2021	20.31	21.36	1.05	0.66	unconfined		0.73
S-438	12/22/2021	20.69	21.58	0.89	0.33	unconfined		0.73
S-438	12/30/2021	20.69	21.57	0.88	0.33	unconfined		0.73
S-438	1/4/2022	20.65	21.42	0.77	0.40	unconfined		0.73
S-438	1/12/2022	20.84	21.90	1.06	0.13	unconfined		0.73
S-438	1/25/2022	20.79	21.69	0.90	0.22	unconfined		0.73
S-438	2/8/2022	20.35	21.84	1.49	0.50	unconfined		0.73
S-438	2/11/2022	20.81	20.97	0.16	0.41	unconfined		0.73
S-438	2/14/2022	21.00	21.98	0.98	-0.01	unconfined		0.73
S-438	2/24/2022	20.13	22.06	1.93	0.60	unconfined		0.73
S-438	2/28/2022	21.12	22.02	0.90	-0.11	unconfined		0.73
S-438	3/17/2022	21.25	22.27	1.02	-0.27	unconfined		0.73
S-438	3/24/2022	21.11	21.93	0.82	-0.07	unconfined		0.73
S-438	3/31/2022	21.07	21.84	0.77	-0.02	unconfined		0.73
S-438	4/8/2022	21.03	21.84	0.81	0.01	unconfined		0.73
S-438	4/12/2022	20.53	20.96	0.43	0.61	unconfined		0.73
S-438	4/20/2022	20.50	20.98	0.48	0.63	unconfined		0.73
S-438	4/25/2022	20.52	21.02	0.50	0.60	unconfined		0.73
S-438	5/2/2022	20.58	21.23	0.65	0.50	unconfined		0.73
S-438	5/9/2022	20.48	20.88	0.40	0.67	unconfined		0.73
S-438	5/26/2022	20.58	20.87	0.29	0.60	unconfined		0.73
S-438	6/15/2022	--	20.34	--	0.92	unconfined		0.73
S-438	7/14/2022	--	20.72	--	0.54	unconfined		0.73
S-438	7/18/2022	--	20.81	--	0.45	unconfined		0.73
S-438	7/26/2022	--	21.01	--	0.25	unconfined		0.73
S-438	8/1/2022	--	21.06	--	0.20	unconfined		0.73
S-438	8/9/2022	--	21.24	--	0.02	unconfined		0.73
S-438	8/24/2022	--	21.07	--	0.19	unconfined		0.73
S-438	8/29/2022	--	21.20	--	0.06	unconfined		0.73
S-438	9/8/2022	--	21.18	--	0.08	unconfined		0.73
S-438	9/22/2022	--	21.12	--	0.14	unconfined		0.73
S-438	9/28/2022	--	21.31	--	-0.05	unconfined		0.73
S-438	10/5/2022	--	--	--	--	unconfined		0.73
S-438	10/13/2022	--	20.92	--	0.34	unconfined		0.73
S-438	10/20/2022	--	21.01	--	0.25	unconfined		0.73
S-438	10/27/2022	--	21.08	--	0.18	unconfined		0.73
S-438	11/1/2022	--	21.12	--	0.14	unconfined		0.73
S-438	11/10/2022	--	21.33	--	-0.07	unconfined		0.73
S-438	11/16/2022	--	21.33	--	-0.07	unconfined		0.73
S-438	11/22/2022	--	21.45	--	-0.19	unconfined		0.73
S-438	11/30/2022	--	21.40	--	-0.14	unconfined		0.73
S-438	12/14/2022	--	18.90	--	2.36	unconfined		0.73
S-438	12/21/2022	19.40	19.90	0.50	1.72	unconfined		0.73
S-438	12/28/2022	--	18.55	--	2.71	unconfined		0.73
S-438	1/3/2023	--	18.53	--	2.73	unconfined		0.73
S-438	1/10/2023	--	18.43	--	2.83	unconfined		0.73
S-438	1/19/2023	--	18.40	--	2.86	unconfined		0.73
S-438	1/26/2023	--	19.49	--	1.77	unconfined		0.73

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S-438	1/31/2023	--	20.09	--	1.17	unconfined		0.73
S-438	2/7/2023	--	20.72	--	0.54	unconfined		0.73
S-438	2/16/2023	--	20.80	--	0.46	unconfined		0.73
S-438	2/28/2023	--	20.76	--	0.50	unconfined		0.73
S-438	3/7/2023	--	20.74	--	0.52	unconfined		0.73
S-438	3/16/2023	--	21.03	--	0.23	unconfined		0.73
S-438	3/23/2023	--	21.10	--	0.16	unconfined		0.73
S-438	3/29/2023	--	21.13	--	0.13	unconfined		0.73
S-438	4/5/2023	--	21.22	--	0.04	unconfined		0.73
S-438	4/13/2023	--	21.26	--	0.00	unconfined		0.73
S-438	4/19/2023	--	21.29	--	-0.03	unconfined		0.73
S-438	4/26/2023	--	21.28	--	-0.02	unconfined		0.73
S-438	5/3/2023	--	20.49	--	0.77	unconfined		0.73
S-438	5/10/2023	--	20.65	--	0.61	unconfined		0.73
S-438	5/16/2023	--	20.88	--	0.38	unconfined		0.73
S-438	5/23/2023	--	21.06	--	0.20	unconfined		0.73
S-438	5/31/2023	--	21.20	--	0.06	unconfined		0.73
S-438	6/7/2023	--	21.10	--	0.16	unconfined		0.73
S-438	6/20/2023	--	21.25	--	0.01	unconfined		0.73
S-438	6/27/2023	--	21.05	--	0.21	unconfined		0.73
S-438	7/19/2023	--	20.15	--	1.11	unconfined		0.73
S-438	7/26/2023	--	20.02	--	1.24	unconfined		0.73
S-438	8/2/2023	--	20.23	--	1.03	unconfined		0.73
S-438	8/9/2023	--	20.14	--	1.12	unconfined		0.73
S-438	9/5/2023	--	20.58	--	0.68	unconfined		0.73
S-438	9/15/2023	--	20.60	--	0.66	unconfined		0.73
S-438	9/20/2023	--	20.52	--	0.74	unconfined		0.73
S-438	9/27/2023	--	19.98	--	1.28	unconfined		0.73
S-438	10/4/2023	--	19.99	--	1.27	unconfined		0.73
S-438	10/17/2023	--	20.28	--	0.98	unconfined		0.73
S-438	10/26/2023	--	20.64	--	0.62	unconfined		0.73
S-438	11/1/2023	--	20.63	--	0.63	unconfined		0.73
S-438	11/9/2023	--	20.73	--	0.53	unconfined		0.73
S-438	11/13/2023	--	20.90	--	0.36	unconfined		0.73
S-438	11/22/2023	--	20.86	--	0.40	unconfined		0.73
S-438	11/29/2023	--	20.85	--	0.41	unconfined		0.73
S-438	12/14/2023	--	20.48	--	0.78	unconfined		0.73
S-438	12/20/2023	--	19.48	--	1.78	unconfined		0.73
S-438	1/3/2024	--	19.48	--	1.78	unconfined		0.73
S-438	1/11/2024	--	18.90	--	2.36	unconfined		0.73
S-438	1/18/2024	--	19.11	--	2.15	unconfined		0.73
S-438	1/24/2024	--	19.70	--	1.56	unconfined		0.73
S-438	1/30/2024	--	19.18	--	2.08	unconfined		0.73
S-438	2/5/2024	--	19.19	--	2.07	unconfined		0.73
S-438	2/15/2024	--	19.65	--	1.61	unconfined		0.73
S-438	2/21/2024	--	19.95	--	1.31	unconfined		0.73
S-438	2/28/2024	--	19.95	--	1.31	unconfined		0.73
S-438	3/5/2024	--	20.08	--	1.18	unconfined		0.73
S-438	3/20/2024	--	19.60	--	1.66	unconfined		0.73
S-438	3/28/2024	--	19.07	--	2.19	unconfined		0.73
S-438	4/3/2024	--	19.08	--	2.18	unconfined		0.73
S-438	4/9/2024	--	18.58	--	2.68	unconfined		0.73
S-438	4/25/2024	--	19.30	--	1.96	unconfined		0.73
S-438	4/30/2024	--	19.39	--	1.87	unconfined		0.73
S-438	5/8/2024	--	19.55	--	1.71	unconfined		0.73
S-438	5/20/2024	--	19.78	--	1.48	unconfined		0.73
S-438	5/31/2024	--	20.05	--	1.21	unconfined		0.73
S-438	6/5/2024	--	20.19	--	1.07	unconfined		0.73
S-438	6/12/2024	--	20.10	--	1.16	unconfined		0.73
S-438	6/19/2024	--	20.32	--	0.94	unconfined		0.73
S-438	6/26/2024	--	20.45	--	0.81	unconfined		0.73
S-438	7/2/2024	--	20.34	--	0.92	unconfined		0.73
S-438	7/10/2024	--	20.08	--	1.18	unconfined		0.73
S-438	7/16/2024	--	20.19	--	1.07	unconfined		0.73
S-438	7/24/2024	--	20.33	--	0.93	unconfined		0.73
S-438	8/1/2024	--	20.60	--	0.66	unconfined		0.73
S-438	8/6/2024	--	20.51	--	0.75	unconfined		0.73

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-438	8/23/2024	--	19.79	--	1.47	unconfined		0.73
S-438	8/28/2024	--	19.96	--	1.30	unconfined		0.73
S-438	9/4/2024	--	20.22	--	1.04	unconfined		0.73
S-438	9/11/2024	--	20.36	--	0.90	unconfined		0.73
S-438	9/18/2024	--	20.52	--	0.74	unconfined		0.73
S-438	9/25/2024	--	20.45	--	0.81	unconfined		0.73
S-438	10/1/2024	--	20.48	--	0.78	unconfined		0.73
S-438	10/14/2024	--	20.85	--	0.41	unconfined		0.73
S-438	10/28/2024	--	21.25	--	0.01	unconfined		0.73
S-438	11/8/2024	--	21.40	--	-0.14	unconfined		0.73
S-438	11/15/2024	--	21.45	--	-0.19	unconfined		0.73
S-438	11/20/2024	--	21.39	--	-0.13	unconfined		0.73
S-438	11/26/2024	--	21.51	--	-0.25	unconfined		0.73
S-438	12/4/2024	--	21.59	--	-0.33	unconfined		0.73
S-438	12/11/2024	--	21.58	--	-0.32	unconfined		0.73
S-438	12/17/2024	--	21.36	--	-0.10	unconfined		0.73
S-438	1/8/2025	--	21.25	--	0.01	unconfined		0.73
S-438	1/16/2025	--	21.55	--	-0.29	unconfined		0.73
S-438	1/24/2025	--	21.64	--	-0.38	unconfined		0.73
S-438	1/29/2025	--	21.72	--	-0.46	unconfined		0.73
S-438	2/5/2025	--	21.71	--	-0.45	unconfined		0.73
S-438	2/12/2025	21.70	21.84	0.14	-0.48	unconfined		0.73
S-438	2/20/2025	21.65	21.66	0.01	-0.39	unconfined		0.73
S-439	1/21/2020	23.36	25.31	1.95	-1.32	unconfined		0.74
S-439	4/17/2020	22.92	24.53	1.61	-0.79	unconfined		0.74
S-439	5/12/2020	23.13	24.86	1.73	-1.03	unconfined		0.74
S-439	5/14/2020	23.16	25.00	1.84	-1.09	unconfined		0.74
S-439	5/19/2020	23.16	24.86	1.70	-1.06	unconfined		0.74
S-439	5/21/2020	23.18	24.72	1.54	-1.03	unconfined		0.74
S-439	5/26/2020	23.15	24.81	1.66	-1.03	unconfined		0.74
S-439	5/28/2020	23.11	24.74	1.63	-0.99	unconfined		0.74
S-439	6/1/2020	23.15	24.87	1.72	-1.05	unconfined		0.74
S-439	6/5/2020	23.09	24.68	1.59	-0.96	unconfined		0.74
S-439	6/8/2020	23.12	24.71	1.59	-0.99	unconfined		0.74
S-439	6/11/2020	23.04	24.56	1.52	-0.89	unconfined		0.74
S-439	6/16/2020	23.12	24.79	1.67	-1.01	unconfined		0.74
S-439	6/19/2020	23.06	24.69	1.63	-0.94	unconfined		0.74
S-439	6/22/2020	23.10	24.76	1.66	-0.98	unconfined		0.74
S-439	6/26/2020	23.13	24.88	1.75	-1.04	unconfined		0.74
S-439	7/1/2020	23.14	24.79	1.65	-1.02	unconfined		0.74
S-439	7/7/2020	23.17	24.87	1.70	-1.07	unconfined		0.74
S-439	7/9/2020	23.15	24.89	1.74	-1.06	unconfined		0.74
S-439	7/9/2020	23.17	24.87	1.70	-1.07	unconfined		0.74
S-439	7/14/2020	23.01	24.44	1.43	-0.83	unconfined		0.74
S-439	7/17/2020	23.02	24.55	1.53	-0.87	unconfined		0.74
S-439	7/22/2020	23.03	25.61	2.58	-1.16	unconfined		0.74
S-439	7/24/2020	23.02	24.54	1.52	-0.87	unconfined		0.74
S-439	7/28/2020	23.08	24.79	1.71	-0.98	unconfined		0.74
S-439	7/30/2020	23.11	24.75	1.64	-0.99	unconfined		0.74
S-439	8/6/2020	22.96	24.42	1.46	-0.79	unconfined		0.74
S-439	8/13/2020	22.72	24.09	1.37	-0.53	unconfined		0.74
S-439	8/18/2020	22.26	24.18	1.92	-0.21	unconfined		0.74
S-439	8/25/2020	22.78	24.32	1.54	-0.63	unconfined		0.74
S-439	8/27/2020	22.84	24.38	1.54	-0.69	unconfined		0.74
S-439	9/1/2020	22.93	24.57	1.64	-0.81	unconfined		0.74
S-439	9/3/2020	22.89	24.49	1.60	-0.76	unconfined		0.74
S-439	9/16/2020	23.03	24.71	1.68	-0.92	unconfined		0.74
S-439	9/18/2020	23.01	24.69	1.68	-0.90	unconfined		0.74
S-439	9/22/2020	23.02	24.05	1.03	-0.74	unconfined		0.74
S-439	9/24/2020	23.01	24.61	1.60	-0.88	unconfined		0.74
S-439	9/28/2020	23.09	24.08	0.99	-0.80	unconfined		0.74
S-439	10/1/2020	23.11	23.94	0.83	-0.78	unconfined		0.74
S-439	10/8/2020	23.04	24.71	1.67	-0.93	unconfined		0.74
S-439	10/9/2020	23.20	24.90	1.70	-1.10	unconfined		0.74
S-439	10/12/2020	23.20	24.85	1.65	-1.08	unconfined		0.74
S-439	10/19/2020	23.14	24.75	1.61	-1.01	unconfined		0.74
S-439	10/30/2020	23.20	24.79	1.59	-1.07	unconfined		0.74

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-439	11/2/2020	23.12	24.52	1.40	-0.94	unconfined		0.74
S-439	11/9/2020	23.18	24.74	1.56	-1.04	unconfined		0.74
S-439	11/10/2020	23.12	24.80	1.68	-1.01	unconfined		0.74
S-439	11/16/2020	23.00	24.43	1.43	-0.82	unconfined		0.74
S-439	11/19/2020	23.04	24.52	1.48	-0.88	unconfined		0.74
S-439	11/23/2020	22.93	24.36	1.43	-0.75	unconfined		0.74
S-439	11/30/2020	22.90	24.43	1.53	-0.75	unconfined		0.74
S-439	12/4/2020	22.91	24.35	1.44	-0.74	unconfined		0.74
S-439	12/8/2020	22.91	24.31	1.40	-0.73	unconfined		0.74
S-439	12/11/2020	22.89	24.26	1.37	-0.70	unconfined		0.74
S-439	12/14/2020	22.80	24.20	1.40	-0.62	unconfined		0.74
S-439	12/18/2020	22.89	24.23	1.34	-0.69	unconfined		0.74
S-439	12/21/2020	22.74	24.11	1.37	-0.55	unconfined		0.74
S-439	12/28/2020	22.46	23.75	1.29	-0.25	unconfined		0.74
S-439	12/31/2020	22.56	23.90	1.34	-0.36	unconfined		0.74
S-439	1/4/2021	22.39	23.72	1.33	-0.19	unconfined		0.74
S-439	1/8/2021	22.32	23.29	0.97	-0.02	unconfined		0.74
S-439	1/15/2021	22.43	23.87	1.44	-0.26	unconfined		0.74
S-439	3/15/2021	22.88	24.31	1.43	-0.70	unconfined		0.74
S-439	4/23/2021	22.75	23.82	1.07	-0.48	unconfined		0.74
S-439	5/3/2021	22.71	23.79	1.08	-0.44	unconfined		0.74
S-439	5/6/2021	22.86	23.90	1.04	-0.58	unconfined		0.74
S-439	5/11/2021	22.91	23.97	1.06	-0.64	unconfined		0.74
S-439	5/14/2021	22.97	24.18	1.21	-0.74	unconfined		0.74
S-439	5/20/2021	23.05	24.09	1.04	-0.77	unconfined		0.74
S-439	5/25/2021	22.85	24.46	1.61	-0.72	unconfined		0.74
S-439	6/3/2021	22.77	24.01	1.24	-0.54	unconfined		0.74
S-439	6/4/2021	22.74	23.98	1.24	-0.51	unconfined		0.74
S-439	6/14/2021	22.62	23.89	1.27	-0.40	unconfined		0.74
S-439	6/18/2021	22.50	23.68	1.18	-0.26	unconfined		0.74
S-439	6/22/2021	22.51	23.72	1.21	-0.28	unconfined		0.74
S-439	6/23/2021	22.50	23.68	1.18	-0.26	unconfined		0.74
S-439	6/24/2021	22.73	23.92	1.19	-0.49	unconfined		0.74
S-439	6/29/2021	22.73	23.92	1.19	-0.49	unconfined		0.74
S-439	7/1/2021	22.76	24.13	1.37	-0.57	unconfined		0.74
S-439	7/6/2021	22.62	23.85	1.23	-0.39	unconfined		0.74
S-439	7/9/2021	22.71	24.03	1.32	-0.51	unconfined		0.74
S-439	7/13/2021	22.71	24.03	1.32	-0.51	unconfined		0.74
S-439	7/20/2021	22.45	23.65	1.20	-0.21	unconfined		0.74
S-439	7/23/2021	22.53	23.78	1.25	-0.31	unconfined		0.74
S-439	7/27/2021	22.53	23.83	1.30	-0.32	unconfined		0.74
S-439	7/30/2021	22.49	23.71	1.22	-0.26	unconfined		0.74
S-439	8/3/2021	22.70	23.98	1.28	-0.49	unconfined		0.74
S-439	8/10/2021	22.78	24.16	1.38	-0.59	unconfined		0.74
S-439	8/13/2021	22.77	24.10	1.33	-0.57	unconfined		0.74
S-439	8/20/2021	22.77	24.20	1.43	-0.59	unconfined		0.74
S-439	8/24/2021	22.68	23.97	1.29	-0.47	unconfined		0.74
S-439	8/27/2021	22.64	23.87	1.23	-0.41	unconfined		0.74
S-439	9/3/2021	22.26	23.41	1.15	-0.01	unconfined		0.74
S-439	9/10/2021	22.23	23.44	1.21	0.00	unconfined		0.74
S-439	9/16/2021	22.43	23.62	1.19	-0.19	unconfined		0.74
S-439	9/22/2021	22.35	23.62	1.27	-0.13	unconfined		0.74
S-439	9/24/2021	22.26	23.47	1.21	-0.03	unconfined		0.74
S-439	9/29/2021	22.36	23.56	1.20	-0.12	unconfined		0.74
S-439	10/5/2021	22.47	23.74	1.27	-0.25	unconfined		0.74
S-439	10/14/2021	22.31	23.52	1.21	-0.08	unconfined		0.74
S-439	10/21/2021	22.62	23.91	1.29	-0.41	unconfined		0.74
S-439	10/28/2021	22.53	23.76	1.23	-0.30	unconfined		0.74
S-439	11/4/2021	22.49	23.67	1.18	-0.25	unconfined		0.74
S-439	11/11/2021	22.57	23.71	1.14	-0.32	unconfined		0.74
S-439	11/18/2021	22.74	24.04	1.30	-0.53	unconfined		0.74
S-439	11/24/2021	22.96	24.35	1.39	-0.77	unconfined		0.74
S-439	12/22/2021	23.28	24.76	1.48	-1.12	unconfined		0.74
S-439	12/30/2021	23.22	24.75	1.53	-1.07	unconfined		0.74
S-439	1/4/2022	23.35	24.77	1.42	-1.17	unconfined		0.74
S-439	1/12/2022	23.39	24.94	1.55	-1.25	unconfined		0.74
S-439	1/25/2022	23.43	24.64	1.21	-1.20	unconfined		0.74

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-439	2/8/2022	23.54	24.64	1.10	-1.28	unconfined		0.74
S-439	2/14/2022	23.68	24.80	1.12	-1.42	unconfined		0.74
S-439	2/24/2022	23.67	24.88	1.21	-1.44	unconfined		0.74
S-439	2/28/2022	23.73	24.81	1.08	-1.46	unconfined		0.74
S-439	3/17/2022	23.84	25.00	1.16	-1.59	unconfined		0.74
S-439	3/24/2022	23.68	24.69	1.01	-1.39	unconfined		0.74
S-439	3/31/2022	23.74	24.37	0.63	-1.36	unconfined		0.74
S-439	4/8/2022	23.64	24.64	1.00	-1.35	unconfined		0.74
S-439	4/12/2022	23.02	24.07	1.05	-0.75	unconfined		0.74
S-439	4/20/2022	23.16	23.66	0.50	-0.74	unconfined		0.74
S-439	4/25/2022	23.20	23.62	0.42	-0.76	unconfined		0.74
S-439	5/2/2022	23.25	23.80	0.55	-0.84	unconfined		0.74
S-439	5/9/2022	23.03	23.69	0.66	-0.65	unconfined		0.74
S-439	5/26/2022	23.01	23.86	0.85	-0.68	unconfined		0.74
S-439	6/15/2022	22.79	23.61	0.82	-0.45	unconfined		0.74
S-439	7/14/2022	23.12	24.44	1.32	-0.92	unconfined		0.74
S-439	7/18/2022	23.07	24.08	1.01	-0.78	unconfined		0.74
S-439	7/26/2022	23.29	24.34	1.05	-1.02	unconfined		0.74
S-439	8/1/2022	23.30	24.46	1.16	-1.05	unconfined		0.74
S-439	8/9/2022	23.44	24.63	1.19	-1.20	unconfined		0.74
S-439	8/24/2022	23.43	24.51	1.08	-1.16	unconfined		0.74
S-439	8/29/2022	23.50	24.65	1.15	-1.25	unconfined		0.74
S-439	9/8/2022	23.44	24.25	0.81	-1.10	unconfined		0.74
S-439	9/22/2022	23.44	24.45	1.01	-1.15	unconfined		0.74
S-439	9/28/2022	23.65	24.86	1.21	-1.42	unconfined		0.74
S-439	10/5/2022	23.27	24.10	0.83	-0.94	unconfined		0.74
S-439	10/13/2022	23.31	24.20	0.89	-0.99	unconfined		0.74
S-439	10/20/2022	23.40	24.25	0.85	-1.07	unconfined		0.74
S-439	10/27/2022	23.46	23.66	0.20	-0.96	unconfined		0.74
S-439	11/1/2022	23.42	24.20	0.78	-1.07	unconfined		0.74
S-439	11/10/2022	23.60	24.48	0.88	-1.28	unconfined		0.74
S-439	11/16/2022	23.61	24.58	0.97	-1.31	unconfined		0.74
S-439	11/22/2022	23.74	24.88	1.14	-1.49	unconfined		0.74
S-439	11/30/2022	23.62	24.59	0.97	-1.32	unconfined		0.74
S-439	12/14/2022	22.79	23.42	0.63	-0.41	unconfined		0.74
S-439	12/28/2022	22.48	22.98	0.50	-0.06	unconfined		0.74
S-439	1/3/2023	--	22.54	--	0.01	unconfined		0.74
S-439	1/10/2023	22.39	22.79	0.40	0.06	unconfined		0.74
S-439	1/19/2023	22.50	22.68	0.18	0.00	unconfined		0.74
S-439	1/26/2023	22.46	23.00	0.54	-0.05	unconfined		0.74
S-439	1/31/2023	22.71	23.28	0.57	-0.31	unconfined		0.74
S-439	2/7/2023	23.29	23.76	0.47	-0.86	unconfined		0.74
S-439	2/16/2023	23.21	23.68	0.47	-0.78	unconfined		0.74
S-439	2/28/2023	23.21	23.55	0.34	-0.75	unconfined		0.74
S-439	3/7/2023	23.20	23.45	0.25	-0.72	unconfined		0.74
S-439	3/16/2023	23.39	23.69	0.30	-0.92	unconfined		0.74
S-439	3/23/2023	23.45	23.80	0.35	-0.99	unconfined		0.74
S-439	3/29/2023	23.50	23.77	0.27	-1.02	unconfined		0.74
S-439	4/5/2023	--	24.40	--	-1.85	unconfined	Sparge in well	0.74
S-439	4/13/2023	--	23.70	--	-1.15	unconfined	Sparge in well	0.74
S-439	4/19/2023	--	23.68	--	-1.13	unconfined		0.74
S-439	4/26/2023	23.63	23.85	0.22	-1.14	unconfined		0.74
S-439	5/3/2023	23.07	23.23	0.16	-0.56	unconfined		0.74
S-439	5/10/2023	23.15	23.47	0.32	-0.68	unconfined		0.74
S-439	5/16/2023	23.32	23.65	0.33	-0.86	unconfined		0.74
S-439	5/23/2023	23.47	23.86	0.39	-1.02	unconfined		0.74
S-439	5/31/2023	23.49	23.85	0.36	-1.03	unconfined		0.74
S-439	6/7/2023	23.50	23.83	0.33	-1.04	unconfined		0.74
S-439	6/20/2023	23.60	24.20	0.60	-1.21	unconfined		0.74
S-439	6/27/2023	23.45	23.98	0.53	-1.04	unconfined		0.74
S-439	7/19/2023	22.70	23.05	0.35	-0.24	unconfined		0.74
S-439	7/26/2023	22.46	22.91	0.45	-0.03	unconfined		0.74
S-439	8/2/2023	22.61	23.19	0.58	-0.21	unconfined		0.74
S-439	8/9/2023	22.52	23.00	0.48	-0.10	unconfined		0.74
S-439	9/5/2023	22.98	23.15	0.17	-0.47	unconfined		0.74
S-439	9/15/2023	23.04	23.20	0.16	-0.53	unconfined		0.74
S-439	9/20/2023	23.00	23.18	0.18	-0.50	unconfined		0.74

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S-439	9/27/2023	22.45	22.64	0.19	0.05	unconfined		0.74
S-439	10/4/2023	22.37	22.81	0.44	0.06	unconfined		0.74
S-439	10/17/2023	--	22.61	--	-0.06	unconfined		0.74
S-439	10/26/2023	22.93	23.50	0.57	-0.53	unconfined		0.74
S-439	11/1/2023	22.93	23.45	0.52	-0.52	unconfined		0.74
S-439	11/9/2023	22.96	23.43	0.47	-0.53	unconfined		0.74
S-439	11/13/2023	23.16	23.75	0.59	-0.76	unconfined		0.74
S-439	11/22/2023	23.10	23.59	0.49	-0.68	unconfined		0.74
S-439	11/29/2023	23.21	23.78	0.57	-0.81	unconfined		0.74
S-439	12/14/2023	22.88	23.35	0.47	-0.45	unconfined		0.74
S-439	12/20/2023	21.98	22.07	0.09	0.55	unconfined		0.74
S-439	1/3/2024	21.80	22.19	0.39	0.65	unconfined		0.74
S-439	1/11/2024	21.46	21.46	--	1.09	unconfined		0.74
S-439	1/18/2024	21.50	21.70	0.20	1.00	unconfined		0.74
S-439	1/24/2024	22.02	22.35	0.33	0.44	unconfined		0.74
S-439	1/30/2024	21.63	21.70	0.07	0.90	unconfined		0.74
S-439	2/5/2024	21.58	21.68	0.10	0.94	unconfined		0.74
S-439	2/15/2024	22.10	22.42	0.32	0.37	unconfined		0.74
S-439	2/21/2024	22.22	22.40	0.18	0.28	unconfined		0.74
S-439	2/28/2024	22.30	22.50	0.20	0.20	unconfined		0.74
S-439	3/5/2024	22.36	22.39	0.03	0.18	unconfined		0.74
S-439	3/20/2024	21.95	22.30	0.35	0.51	unconfined		0.74
S-439	3/28/2024	--	21.62	--	0.93	unconfined		0.74
S-439	4/3/2024	--	21.53	--	1.02	unconfined		0.74
S-439	4/9/2024	--	21.05	--	1.50	unconfined		0.74
S-439	4/25/2024	21.75	21.86	0.11	0.77	unconfined		0.74
S-439	4/30/2024	--	21.68	--	0.87	unconfined		0.74
S-439	5/8/2024	22.05	22.06	0.01	0.50	unconfined		0.74
S-439	5/20/2024	--	21.92	--	0.63	unconfined		0.74
S-439	5/31/2024	22.48	22.50	0.02	0.06	unconfined		0.74
S-439	6/5/2024	22.49	22.50	0.01	0.06	unconfined		0.74
S-439	6/12/2024	22.32	22.33	0.01	0.23	unconfined		0.74
S-439	6/19/2024	--	22.61	--	-0.06	unconfined		0.74
S-439	6/26/2024	22.74	22.77	0.03	-0.20	unconfined		0.74
S-439	7/2/2024	--	22.40	--	0.15	unconfined		0.74
S-439	7/10/2024	--	22.40	--	0.15	unconfined		0.74
S-439	7/16/2024	22.30	22.32	0.02	0.24	unconfined		0.74
S-439	7/24/2024	--	22.50	--	0.05	unconfined		0.74
S-439	8/1/2024	--	22.70	--	-0.15	unconfined		0.74
S-439	8/6/2024	22.98	23.00	0.02	-0.44	unconfined		0.74
S-439	8/23/2024	22.16	22.45	0.29	0.31	unconfined		0.74
S-439	8/28/2024	22.26	22.51	0.25	0.22	unconfined		0.74
S-439	9/4/2024	22.63	22.93	0.30	-0.16	unconfined		0.74
S-439	9/11/2024	22.72	22.99	0.27	-0.24	unconfined		0.74
S-439	9/18/2024	22.73	22.95	0.22	-0.24	unconfined		0.74
S-439	9/25/2024	22.43	22.68	0.25	0.05	unconfined		0.74
S-439	10/1/2024	22.82	23.03	0.21	-0.33	unconfined		0.74
S-439	10/14/2024	23.32	23.62	0.30	-0.85	unconfined		0.74
S-439	10/28/2024	23.52	23.73	0.21	-1.03	unconfined		0.74
S-439	11/8/2024	23.58	23.59	0.01	-1.03	unconfined		0.74
S-439	11/15/2024	23.70	23.89	0.19	-1.20	unconfined		0.74
S-439	11/20/2024	23.62	23.75	0.13	-1.10	unconfined		0.74
S-439	11/26/2024	23.75	23.85	0.10	-1.23	unconfined		0.74
S-439	12/4/2024	23.73	23.90	0.17	-1.22	unconfined		0.74
S-439	12/11/2024	23.91	24.07	0.16	-1.40	unconfined		0.74
S-439	12/17/2024	23.80	23.95	0.15	-1.29	unconfined		0.74
S-439	1/8/2025	23.70	23.92	0.22	-1.21	unconfined		0.74
S-439	1/16/2025	23.89	24.10	0.21	-1.40	unconfined		0.74
S-439	1/24/2025	24.07	24.35	0.28	-1.59	unconfined		0.74
S-439	1/29/2025	24.13	24.44	0.31	-1.66	unconfined		0.74
S-439	2/5/2025	24.19	24.45	0.26	-1.71	unconfined		0.74
S-439	2/12/2025	24.19	24.43	0.24	-1.70	unconfined		0.74
S-439	2/20/2025	24.06	24.25	0.19	-1.56	unconfined		0.74
S-479	12/22/2021	--	15.21	--	0.30	unconfined		0.73
S-479	12/30/2021	--	15.23	--	0.28	unconfined		0.73
S-479	1/4/2022	--	15.15	--	0.36	unconfined		0.73
S-479	1/25/2022	--	15.40	--	0.11	unconfined		0.73

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Well Gauging Summary, 2018 to Present
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC, Philadelphia, PA

Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-479	2/8/2022	15.40	15.86	0.46	-0.02	unconfined		0.73
S-479	2/11/2022	15.41	15.89	0.48	-0.03	unconfined		0.73
S-479	2/14/2022	15.50	15.96	0.46	-0.12	unconfined		0.73
S-479	2/24/2022	15.57	16.03	0.46	-0.19	unconfined		0.73
S-479	2/28/2022	15.50	16.06	0.56	-0.14	unconfined		0.73
S-479	3/17/2022	--	16.27	--	-0.76	unconfined		0.73
S-479	3/24/2022	15.46	16.30	0.84	-0.18	unconfined		0.73
S-479	3/31/2022	15.43	16.00	0.57	-0.08	unconfined		0.73
S-479	4/8/2022	15.45	16.01	0.56	-0.09	unconfined		0.73
S-479	4/12/2022	14.77	15.39	0.62	0.57	unconfined		0.73
S-479	4/19/2022	14.81	15.43	0.62	0.53	unconfined		0.73
S-479	4/25/2022	14.92	14.98	0.06	0.57	unconfined		0.73
S-479	5/2/2022	15.10	15.12	0.02	0.40	unconfined		0.73
S-479	5/9/2022	14.86	14.89	0.03	0.64	unconfined		0.73
S-479	5/26/2022	14.93	14.95	0.02	0.57	unconfined		0.73
S-479	6/15/2022	--	14.61	--	0.90	unconfined		0.73
S-479	7/14/2022	--	14.99	--	0.52	unconfined		0.73
S-479	7/18/2022	--	15.10	--	0.41	unconfined		0.73
S-479	7/26/2022	15.26	15.28	0.02	0.24	unconfined		0.73
S-479	8/1/2022	15.34	15.36	0.02	0.16	unconfined		0.73
S-479	8/9/2022	14.99	15.00	0.01	0.52	unconfined		0.73
S-479	8/24/2022	15.32	15.33	0.01	0.19	unconfined		0.73
S-479	8/29/2022	--	15.43	--	0.08	unconfined		0.73
S-479	9/8/2022	--	15.42	--	0.09	unconfined		0.73
S-479	9/22/2022	--	15.45	--	0.06	unconfined		0.73
S-479	9/28/2022	--	15.59	--	-0.08	unconfined		0.73
S-479	10/13/2022	--	15.18	--	0.33	unconfined		0.73
S-479	10/20/2022	--	15.26	--	0.25	unconfined		0.73
S-479	10/27/2022	--	15.38	--	0.13	unconfined		0.73
S-479	11/1/2022	--	15.41	--	0.10	unconfined		0.73
S-479	11/10/2022	--	15.62	--	-0.11	unconfined		0.73
S-479	11/16/2022	--	15.60	--	-0.09	unconfined		0.73
S-479	11/22/2022	--	15.72	--	-0.21	unconfined		0.73
S-479	11/30/2022	--	15.69	--	-0.18	unconfined		0.73
S-479	12/14/2022	--	11.77	--	3.74	unconfined		0.73
S-479	12/28/2022	--	11.21	--	4.30	unconfined		0.73
S-479	1/3/2023	--	11.22	--	4.29	unconfined		0.73
S-479	1/10/2023	--	11.10	--	4.41	unconfined		0.73
S-479	1/19/2023	--	11.04	--	4.47	unconfined		0.73
S-479	1/26/2023	--	13.10	--	2.41	unconfined		0.73
S-479	1/31/2023	--	14.22	--	1.29	unconfined		0.73
S-479	2/7/2023	--	14.93	--	0.58	unconfined		0.73
S-479	2/16/2023	--	15.01	--	0.50	unconfined		0.73
S-479	2/28/2023	--	15.03	--	0.48	unconfined		0.73
S-479	3/7/2023	--	14.97	--	0.54	unconfined		0.73
S-479	3/16/2023	--	15.23	--	0.28	unconfined		0.73
S-479	3/23/2023	--	15.35	--	0.16	unconfined		0.73
S-479	3/29/2023	--	15.35	--	0.16	unconfined		0.73
S-479	4/5/2023	--	15.49	--	0.02	unconfined		0.73
S-479	4/13/2023	--	15.54	--	-0.03	unconfined		0.73
S-479	4/19/2023	--	15.57	--	-0.06	unconfined		0.73
S-479	4/26/2023	--	15.60	--	-0.09	unconfined		0.73
S-479	5/3/2023	--	14.74	--	0.77	unconfined		0.73
S-479	5/10/2023	--	14.90	--	0.61	unconfined		0.73
S-479	5/16/2023	--	15.12	--	0.39	unconfined		0.73
S-479	5/23/2023	--	15.34	--	0.17	unconfined		0.73
S-479	5/31/2023	--	15.48	--	0.03	unconfined		0.73
S-479	6/7/2023	--	15.40	--	0.11	unconfined		0.73
S-479	6/20/2023	--	16.52	--	-1.01	unconfined		0.73
S-479	6/27/2023	--	15.34	--	0.17	unconfined		0.73
S-479	7/19/2023	--	14.40	--	1.11	unconfined		0.73
S-479	7/26/2023	--	14.29	--	1.22	unconfined		0.73
S-479	8/2/2023	--	14.51	--	1.00	unconfined		0.73
S-479	8/9/2023	--	14.43	--	1.08	unconfined		0.73
S-479	8/23/2023	--	14.70	--	0.81	unconfined		0.73
S-479	8/30/2023	--	14.73	--	0.78	unconfined		0.73
S-479	9/5/2023	--	14.89	--	0.62	unconfined		0.73

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-479	9/15/2023	--	14.90	--	0.61	unconfined		0.73
S-479	9/20/2023	--	14.81	--	0.70	unconfined		0.73
S-479	9/27/2023	--	14.20	--	1.31	unconfined		0.73
S-479	10/4/2023	--	14.25	--	1.26	unconfined		0.73
S-479	10/17/2023	--	14.58	--	0.93	unconfined		0.73
S-479	10/26/2023	--	14.95	--	0.56	unconfined		0.73
S-479	11/1/2023	--	14.95	--	0.56	unconfined		0.73
S-479	11/9/2023	--	15.05	--	0.46	unconfined		0.73
S-479	11/13/2023	--	15.20	--	0.31	unconfined		0.73
S-479	11/22/2023	--	15.24	--	0.27	unconfined		0.73
S-479	11/29/2023	--	15.11	--	0.40	unconfined		0.73
S-479	12/14/2023	--	14.74	--	0.77	unconfined		0.73
S-479	12/20/2023	--	13.51	--	2.00	unconfined		0.73
S-479	1/3/2024	--	13.74	--	1.77	unconfined		0.73
S-479	1/11/2024	--	13.02	--	2.49	unconfined		0.73
S-479	1/18/2024	--	13.31	--	2.20	unconfined		0.73
S-479	1/24/2024	--	13.92	--	1.59	unconfined		0.73
S-479	1/30/2024	--	13.40	--	2.11	unconfined		0.73
S-479	2/5/2024	--	13.40	--	2.11	unconfined		0.73
S-479	2/15/2024	--	13.89	--	1.62	unconfined		0.73
S-479	2/21/2024	--	14.19	--	1.32	unconfined		0.73
S-479	2/28/2024	--	14.21	--	1.30	unconfined		0.73
S-479	3/5/2024	--	14.34	--	1.17	unconfined		0.73
S-479	3/20/2024	--	13.81	--	1.70	unconfined		0.73
S-479	3/28/2024	--	13.23	--	2.28	unconfined		0.73
S-479	4/3/2024	--	13.23	--	2.28	unconfined		0.73
S-479	4/9/2024	--	12.77	--	2.74	unconfined		0.73
S-479	4/25/2024	--	13.55	--	1.96	unconfined		0.73
S-479	4/30/2024	--	13.68	--	1.83	unconfined		0.73
S-479	5/8/2024	--	13.79	--	1.72	unconfined		0.73
S-479	5/20/2024	--	14.00	--	1.51	unconfined		0.73
S-479	5/31/2024	--	14.29	--	1.22	unconfined		0.73
S-479	6/5/2024	--	14.40	--	1.11	unconfined		0.73
S-479	6/12/2024	--	14.30	--	1.21	unconfined		0.73
S-479	6/19/2024	--	14.55	--	0.96	unconfined		0.73
S-479	6/26/2024	--	14.71	--	0.80	unconfined		0.73
S-479	7/2/2024	--	14.60	--	0.91	unconfined		0.73
S-479	7/10/2024	--	14.33	--	1.18	unconfined		0.73
S-479	7/16/2024	--	14.44	--	1.07	unconfined		0.73
S-479	7/24/2024	--	14.63	--	0.88	unconfined		0.73
S-479	8/1/2024	--	14.90	--	0.61	unconfined		0.73
S-479	8/6/2024	--	14.88	--	0.63	unconfined		0.73
S-479	8/23/2024	--	14.04	--	1.47	unconfined		0.73
S-479	8/28/2024	--	14.26	--	1.25	unconfined		0.73
S-479	9/4/2024	--	14.53	--	0.98	unconfined		0.73
S-479	9/11/2024	--	14.73	--	0.78	unconfined		0.73
S-479	9/18/2024	--	14.85	--	0.66	unconfined		0.73
S-479	9/25/2024	--	14.75	--	0.76	unconfined		0.73
S-479	10/1/2024	--	14.81	--	0.70	unconfined		0.73
S-479	10/14/2024	--	15.25	--	0.26	unconfined		0.73
S-479	10/28/2024	--	15.64	--	-0.13	unconfined		0.73
S-479	11/8/2024	--	15.79	--	-0.28	unconfined		0.73
S-479	11/15/2024	--	15.78	--	-0.27	unconfined		0.73
S-479	11/20/2024	--	15.76	--	-0.25	unconfined		0.73
S-479	11/26/2024	--	15.90	--	-0.39	unconfined		0.73
S-479	12/4/2024	--	15.85	--	-0.34	unconfined		0.73
S-479	12/11/2024	--	15.87	--	-0.36	unconfined		0.73
S-479	12/17/2024	--	15.64	--	-0.13	unconfined		0.73
S-479	1/8/2025	--	15.52	--	-0.01	unconfined		0.73
S-479	1/16/2025	--	15.81	--	-0.30	unconfined		0.73
S-479	1/24/2025	--	16.00	--	-0.49	unconfined		0.73
S-479	1/29/2025	--	16.02	--	-0.51	unconfined		0.73
S-479	2/5/2025	--	16.09	--	-0.58	unconfined		0.73
S-479	2/12/2025	--	16.08	--	-0.57	unconfined		0.73
S-479	2/20/2025	--	15.88	--	-0.37	unconfined		0.73
S-480	12/22/2021	18.24	20.54	2.30	-0.12	unconfined		0.75
S-480	12/30/2021	18.23	20.34	2.11	-0.06	unconfined		0.75

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-480	1/4/2022	18.34	20.65	2.31	-0.22	unconfined		0.75
S-480	1/12/2022	18.34	20.34	2.00	-0.14	unconfined		0.75
S-480	1/25/2022	18.38	20.40	2.02	-0.18	unconfined		0.75
S-480	2/8/2022	18.42	20.21	1.79	-0.17	unconfined		0.75
S-480	2/14/2022	18.55	21.07	2.52	-0.48	unconfined		0.75
S-480	2/24/2022	18.47	20.58	2.11	-0.30	unconfined		0.75
S-480	2/28/2022	18.65	20.90	2.25	-0.51	unconfined		0.75
S-480	3/17/2022	16.69	18.25	1.56	1.62	unconfined		0.75
S-480	4/8/2022	18.43	20.34	1.91	-0.21	unconfined		0.75
S-480	4/12/2022	18.02	19.58	1.56	0.29	unconfined		0.75
S-480	4/19/2022	17.99	19.65	1.66	0.30	unconfined		0.75
S-480	4/25/2022	17.94	19.42	1.48	0.39	unconfined		0.75
S-480	5/2/2022	18.00	20.09	2.09	0.18	unconfined		0.75
S-480	5/9/2022	17.87	19.42	1.55	0.44	unconfined		0.75
S-480	5/26/2022	17.90	19.59	1.69	0.38	unconfined		0.75
S-480	6/15/2022	17.69	19.44	1.75	0.57	unconfined		0.75
S-480	7/14/2022	18.00	20.32	2.32	0.12	unconfined		0.75
S-480	7/18/2022	17.92	19.90	1.98	0.29	unconfined		0.75
S-480	7/26/2022	18.15	20.10	1.95	0.06	unconfined		0.75
S-480	8/1/2022	18.15	20.31	2.16	0.01	unconfined		0.75
S-480	8/9/2022	18.31	20.50	2.19	-0.16	unconfined		0.75
S-480	8/24/2022	18.31	20.78	2.47	-0.23	unconfined		0.75
S-480	8/29/2022	18.40	20.69	2.29	-0.27	unconfined		0.75
S-480	9/8/2022	18.33	20.36	2.03	-0.14	unconfined		0.75
S-480	9/22/2022	18.29	20.42	2.13	-0.12	unconfined		0.75
S-480	9/28/2022	18.53	20.99	2.46	-0.45	unconfined		0.75
S-480	10/5/2022	18.23	19.80	1.57	0.08	unconfined		0.75
S-480	10/13/2022	19.29	20.22	0.93	-0.82	unconfined		0.75
S-480	10/20/2022	18.26	20.42	2.16	-0.10	unconfined		0.75
S-480	10/27/2022	18.33	20.61	2.28	-0.20	unconfined		0.75
S-480	11/1/2022	18.26	20.25	1.99	-0.06	unconfined		0.75
S-480	11/10/2022	19.40	20.75	1.35	-1.03	unconfined		0.75
S-480	11/16/2022	18.45	20.50	2.05	-0.26	unconfined		0.75
S-480	11/22/2022	18.60	21.05	2.45	-0.51	unconfined		0.75
S-480	11/30/2022	18.49	20.36	1.87	-0.26	unconfined		0.75
S-480	12/14/2022	17.81	19.42	1.61	0.49	unconfined		0.75
S-480	12/21/2022	18.33	18.99	0.66	0.21	unconfined		0.75
S-480	12/28/2022	17.52	19.02	1.50	0.81	unconfined		0.75
S-480	1/3/2023	17.38	18.98	1.60	0.92	unconfined		0.75
S-480	1/10/2023	17.38	19.05	1.67	0.90	unconfined		0.75
S-480	1/19/2023	17.45	18.80	1.35	0.92	unconfined		0.75
S-480	1/26/2023	17.34	19.01	1.67	0.94	unconfined		0.75
S-480	1/31/2023	17.55	19.28	1.73	0.72	unconfined		0.75
S-480	2/7/2023	18.00	20.10	2.10	0.17	unconfined		0.75
S-480	2/16/2023	17.95	19.73	1.78	0.31	unconfined		0.75
S-480	2/28/2023	17.96	19.78	1.82	0.29	unconfined		0.75
S-480	3/7/2023	17.94	19.71	1.77	0.32	unconfined		0.75
S-480	3/16/2023	18.14	19.47	1.33	0.23	unconfined		0.75
S-480	3/23/2023	18.12	20.04	1.92	0.10	unconfined		0.75
S-480	3/29/2023	18.20	19.96	1.76	0.06	unconfined		0.75
S-480	4/5/2023	18.30	20.61	2.31	-0.18	unconfined		0.75
S-480	4/13/2023	18.30	20.21	1.91	-0.08	unconfined		0.75
S-480	4/19/2023	18.65	20.35	1.70	-0.37	unconfined		0.75
S-480	4/26/2023	18.38	20.30	1.92	-0.16	unconfined		0.75
S-480	5/3/2023	17.95	19.38	1.43	0.40	unconfined		0.75
S-480	5/10/2023	17.95	19.71	1.76	0.31	unconfined		0.75
S-480	5/16/2023	18.02	19.99	1.97	0.19	unconfined		0.75
S-480	5/23/2023	18.18	20.05	1.87	0.05	unconfined		0.75
S-480	5/31/2023	18.22	20.18	1.96	-0.01	unconfined		0.75
S-480	6/7/2023	18.21	20.58	2.37	-0.10	unconfined		0.75
S-480	6/20/2023	18.35	20.62	2.27	-0.22	unconfined		0.75
S-480	6/27/2023	18.22	20.03	1.81	0.03	unconfined		0.75
S-480	7/19/2023	17.50	19.10	1.60	0.80	unconfined		0.75
S-480	7/26/2023	17.28	18.80	1.52	1.04	unconfined		0.75
S-480	8/2/2023	17.38	19.15	1.77	0.88	unconfined		0.75
S-480	8/9/2023	17.28	18.90	1.62	1.02	unconfined		0.75
S-480	8/23/2023	17.48	19.30	1.82	0.77	unconfined		0.75

Table 3-2
Well Gauging Summary, 2018 to Present
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC, Philadelphia, PA

Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-480	8/30/2023	17.52	19.40	1.88	0.71	unconfined		0.75
S-480	9/5/2023	17.64	19.75	2.11	0.53	unconfined		0.75
S-480	9/15/2023	17.71	19.79	2.08	0.47	unconfined		0.75
S-480	9/20/2023	17.69	19.70	2.01	0.51	unconfined		0.75
S-480	9/27/2023	17.25	18.64	1.39	1.11	unconfined		0.75
S-480	10/4/2023	17.21	18.86	1.65	1.08	unconfined		0.75
S-480	10/17/2023	17.40	19.44	2.04	0.79	unconfined		0.75
S-480	10/26/2023	17.65	19.90	2.25	0.49	unconfined		0.75
S-480	11/1/2023	17.65	19.78	2.13	0.52	unconfined		0.75
S-480	11/9/2023	17.69	19.60	1.91	0.53	unconfined		0.75
S-480	11/13/2023	17.90	20.09	2.19	0.25	unconfined		0.75
S-480	11/22/2023	17.84	19.58	1.74	0.43	unconfined		0.75
S-480	11/29/2023	17.95	20.30	2.35	0.16	unconfined		0.75
S-480	12/14/2023	17.69	20.05	2.36	0.42	unconfined		0.75
S-480	12/20/2023	17.01	18.27	1.26	1.38	unconfined		0.75
S-480	1/3/2024	16.59	18.25	1.66	1.70	unconfined		0.75
S-480	1/11/2024	16.39	17.61	1.22	2.01	unconfined		0.75
S-480	1/24/2024	16.77	18.55	1.78	1.49	unconfined		0.75
S-480	1/30/2024	16.34	18.20	1.86	1.90	unconfined		0.75
S-480	2/5/2024	--	--	--	--	unconfined	Unable to access	0.75
S-480	2/15/2024	--	--	--	--	unconfined	Unable to access	0.75
S-480	2/21/2024	--	--	--	--	unconfined	Unable to access	0.75
S-480	2/28/2024	--	--	--	--	unconfined	Unable to access	0.75
S-480	3/5/2024	--	--	--	--	unconfined	Unable to access	0.75
S-480	3/20/2024	16.75	18.35	1.60	1.55	unconfined		0.75
S-480	3/28/2024	--	--	--	--	unconfined	Unable to access	0.75
S-480	4/3/2024	16.33	17.23	0.90	2.15	unconfined		0.75
S-480	4/9/2024	15.94	17.22	1.28	2.44	unconfined		0.75
S-480	4/25/2024	16.45	18.30	1.85	1.79	unconfined		0.75
S-480	4/30/2024	16.42	17.91	1.49	1.91	unconfined		0.75
S-480	5/8/2024	16.16	18.25	2.09	2.02	unconfined		0.75
S-480	5/20/2024	16.89	18.50	1.61	1.41	unconfined		0.75
S-480	5/31/2024	17.21	18.75	1.54	1.11	unconfined		0.75
S-480	6/5/2024	17.30	18.95	1.65	0.99	unconfined		0.75
S-480	6/12/2024	17.21	18.93	1.72	1.06	unconfined		0.75
S-480	6/19/2024	17.37	19.22	1.85	0.87	unconfined		0.75
S-480	6/26/2024	17.44	19.22	1.78	0.82	unconfined		0.75
S-480	7/2/2024	17.43	18.89	1.46	0.91	unconfined		0.75
S-480	7/10/2024	17.14	18.63	1.49	1.19	unconfined		0.75
S-480	7/16/2024	17.24	18.82	1.58	1.07	unconfined		0.75
S-480	7/24/2024	17.44	19.22	1.78	0.82	unconfined		0.75
S-480	8/1/2024	17.64	19.65	2.01	0.56	unconfined		0.75
S-480	8/6/2024	17.61	19.60	1.99	0.59	unconfined		0.75
S-480	8/23/2024	16.90	18.32	1.42	1.45	unconfined		0.75
S-480	8/28/2024	17.00	18.64	1.64	1.29	unconfined		0.75
S-480	9/4/2024	17.32	19.20	1.88	0.91	unconfined		0.75
S-480	9/11/2024	17.43	19.35	1.92	0.79	unconfined		0.75
S-480	9/18/2024	17.51	19.67	2.16	0.65	unconfined		0.75
S-480	9/25/2024	17.46	19.38	1.92	0.76	unconfined		0.75
S-480	10/1/2024	17.60	19.81	2.21	0.55	unconfined		0.75
S-480	10/14/2024	--	--	--	--	unconfined	Destroyed	0.75
S-481	12/22/2021	--	16.46	--	0.06	unconfined		0.73
S-481	12/30/2021	--	16.43	--	0.09	unconfined		0.73
S-481	1/4/2022	--	16.49	--	0.03	unconfined		0.73
S-481	1/25/2022	--	16.61	--	-0.09	unconfined		0.73
S-481	2/8/2022	16.50	17.09	0.59	-0.14	unconfined		0.73
S-481	2/11/2022	16.43	17.61	1.18	-0.23	unconfined		0.73
S-481	2/14/2022	16.45	17.97	1.52	-0.35	unconfined		0.73
S-481	2/24/2022	15.50	16.67	1.17	0.70	unconfined		0.73
S-481	2/28/2022	16.52	18.06	1.54	-0.42	unconfined		0.73
S-481	3/24/2022	16.46	17.92	1.46	-0.34	unconfined		0.73
S-481	3/31/2022	16.46	17.77	1.31	-0.30	unconfined		0.73
S-481	4/8/2022	16.43	17.91	1.48	-0.31	unconfined		0.73
S-481	4/12/2022	15.77	17.26	1.49	0.34	unconfined		0.73
S-481	4/19/2022	15.80	17.21	1.41	0.33	unconfined		0.73
S-481	4/25/2022	15.75	17.19	1.44	0.38	unconfined		0.73
S-481	5/2/2022	15.92	17.46	1.54	0.18	unconfined		0.73

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-481	5/9/2022	15.67	17.05	1.38	0.47	unconfined		0.73
S-481	5/26/2022	15.82	17.12	1.30	0.34	unconfined		0.73
S-481	6/15/2022	15.50	16.80	1.30	0.66	unconfined		0.73
S-481	7/14/2022	15.92	17.33	1.41	0.21	unconfined		0.73
S-481	7/18/2022	15.92	17.21	1.29	0.25	unconfined		0.73
S-481	7/26/2022	16.14	17.52	1.38	0.00	unconfined		0.73
S-481	8/1/2022	16.20	17.46	1.26	-0.02	unconfined		0.73
S-481	8/9/2022	16.37	17.70	1.33	-0.21	unconfined		0.73
S-481	8/24/2022	16.30	17.70	1.40	-0.16	unconfined		0.73
S-481	8/29/2022	16.34	17.71	1.37	-0.19	unconfined		0.73
S-481	9/8/2022	16.35	17.40	1.05	-0.12	unconfined		0.73
S-481	9/22/2022	16.32	17.51	1.19	-0.13	unconfined		0.73
S-481	9/28/2022	16.54	17.90	1.36	-0.39	unconfined		0.73
S-481	10/5/2022	15.49	15.92	0.43	0.91	unconfined		0.73
S-481	10/13/2022	16.15	17.32	1.17	0.05	unconfined		0.73
S-481	10/20/2022	16.26	17.35	1.09	-0.04	unconfined		0.73
S-481	10/27/2022	16.30	17.55	1.25	-0.12	unconfined		0.73
S-481	11/1/2022	16.30	17.42	1.12	-0.09	unconfined		0.73
S-481	11/10/2022	16.55	17.77	1.22	-0.36	unconfined		0.73
S-481	11/16/2022	--	16.22	--	0.30	unconfined		0.73
S-481	11/22/2022	16.70	17.97	1.27	-0.53	unconfined		0.73
S-481	11/30/2022	16.61	17.54	0.93	-0.34	unconfined		0.73
S-481	12/14/2022	12.77	15.40	2.63	3.03	unconfined		0.73
S-481	12/21/2022	12.44	14.88	2.44	3.41	unconfined		0.73
S-481	12/28/2022	12.38	14.52	2.14	3.55	unconfined		0.73
S-481	1/3/2023	12.33	14.40	2.07	3.62	unconfined		0.73
S-481	1/10/2023	12.16	13.50	1.34	3.99	unconfined		0.73
S-481	1/19/2023	11.93	13.16	1.23	4.25	unconfined		0.73
S-481	1/26/2023	14.39	15.12	0.73	1.93	unconfined		0.73
S-481	1/31/2023	15.50	16.05	0.55	0.87	unconfined		0.73
S-481	2/7/2023	16.12	16.79	0.67	0.22	unconfined		0.73
S-481	2/16/2023	16.11	16.68	0.57	0.25	unconfined		0.73
S-481	2/28/2023	16.05	16.51	0.46	0.34	unconfined		0.73
S-481	3/7/2023	16.23	16.39	0.16	0.25	unconfined		0.73
S-481	3/16/2023	16.44	16.78	0.34	-0.01	unconfined		0.73
S-481	3/23/2023	16.45	16.80	0.35	-0.03	unconfined		0.73
S-481	3/29/2023	16.43	16.75	0.32	0.00	unconfined		0.73
S-481	4/5/2023	16.57	16.95	0.38	-0.15	unconfined		0.73
S-481	4/13/2023	16.57	16.95	0.38	-0.15	unconfined		0.73
S-481	4/19/2023	16.62	17.00	0.38	-0.20	unconfined		0.73
S-481	4/26/2023	16.62	16.98	0.36	-0.20	unconfined		0.73
S-481	5/3/2023	16.02	16.16	0.14	0.46	unconfined		0.73
S-481	5/10/2023	16.09	16.29	0.20	0.38	unconfined		0.73
S-481	5/16/2023	16.35	16.52	0.17	0.12	unconfined		0.73
S-481	5/23/2023	16.43	16.70	0.27	0.02	unconfined		0.73
S-481	5/31/2023	16.52	16.84	0.32	-0.09	unconfined		0.73
S-481	6/7/2023	16.55	16.85	0.30	-0.11	unconfined		0.73
S-481	6/20/2023	16.65	16.96	0.31	-0.21	unconfined		0.73
S-481	6/27/2023	--	16.50	--	0.02	unconfined		0.73
S-481	7/19/2023	--	15.79	--	0.73	unconfined		0.73
S-481	7/26/2023	--	15.56	--	0.96	unconfined		0.73
S-481	8/2/2023	--	15.81	--	0.71	unconfined		0.73
S-481	8/9/2023	--	15.66	--	0.86	unconfined		0.73
S-481	8/23/2023	--	15.89	--	0.63	unconfined		0.73
S-481	8/30/2023	--	15.95	--	0.57	unconfined		0.73
S-481	9/5/2023	--	16.10	--	0.42	unconfined		0.73
S-481	9/15/2023	--	16.18	--	0.34	unconfined		0.73
S-481	9/20/2023	--	16.13	--	0.39	unconfined		0.73
S-481	9/27/2023	--	15.52	--	1.00	unconfined		0.73
S-481	10/4/2023	--	15.55	--	0.97	unconfined		0.73
S-481	10/17/2023	--	15.81	--	0.71	unconfined		0.73
S-481	10/26/2023	--	16.16	--	0.36	unconfined		0.73
S-481	11/1/2023	--	16.20	--	0.32	unconfined		0.73
S-481	11/9/2023	--	16.20	--	0.32	unconfined		0.73
S-481	11/13/2023	--	16.44	--	0.08	unconfined		0.73
S-481	11/22/2023	--	16.25	--	0.27	unconfined		0.73
S-481	11/29/2023	--	16.47	--	0.05	unconfined		0.73

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-481	12/14/2023	--	16.15	--	0.37	unconfined		0.73
S-481	12/20/2023	--	15.13	--	1.39	unconfined		0.73
S-481	1/3/2024	--	15.05	--	1.47	unconfined		0.73
S-481	1/11/2024	--	14.55	--	1.97	unconfined		0.73
S-481	1/18/2024	--	14.74	--	1.78	unconfined		0.73
S-481	1/24/2024	--	15.35	--	1.17	unconfined		0.73
S-481	1/30/2024	--	14.77	--	1.75	unconfined		0.73
S-481	2/5/2024	--	14.68	--	1.84	unconfined		0.73
S-481	2/15/2024	--	15.20	--	1.32	unconfined		0.73
S-481	2/21/2024	--	15.40	--	1.12	unconfined		0.73
S-481	2/28/2024	--	15.39	--	1.13	unconfined		0.73
S-481	3/5/2024	--	15.50	--	1.02	unconfined		0.73
S-481	3/20/2024	--	15.13	--	1.39	unconfined		0.73
S-481	3/28/2024	--	14.67	--	1.85	unconfined		0.73
S-481	4/3/2024	--	14.54	--	1.98	unconfined		0.73
S-481	4/9/2024	--	14.29	--	2.23	unconfined		0.73
S-481	4/25/2024	--	14.90	--	1.62	unconfined		0.73
S-481	4/30/2024	--	14.86	--	1.66	unconfined		0.73
S-481	5/8/2024	--	15.14	--	1.38	unconfined		0.73
S-481	5/20/2024	--	15.30	--	1.22	unconfined		0.73
S-481	5/31/2024	--	15.60	--	0.92	unconfined		0.73
S-481	6/5/2024	--	15.73	--	0.79	unconfined		0.73
S-481	6/12/2024	--	15.62	--	0.90	unconfined		0.73
S-481	6/19/2024	--	15.88	--	0.64	unconfined		0.73
S-481	6/26/2024	--	15.94	--	0.58	unconfined		0.73
S-481	7/2/2024	--	15.87	--	0.65	unconfined		0.73
S-481	7/10/2024	--	15.61	--	0.91	unconfined		0.73
S-481	7/16/2024	--	15.66	--	0.86	unconfined		0.73
S-481	7/24/2024	--	15.87	--	0.65	unconfined		0.73
S-481	8/1/2024	--	16.14	--	0.38	unconfined		0.73
S-481	8/6/2024	--	16.12	--	0.40	unconfined		0.73
S-481	8/23/2024	--	15.34	--	1.18	unconfined		0.73
S-481	8/28/2024	--	15.50	--	1.02	unconfined		0.73
S-481	9/4/2024	--	15.79	--	0.73	unconfined		0.73
S-481	9/11/2024	--	15.91	--	0.61	unconfined		0.73
S-481	9/18/2024	--	16.08	--	0.44	unconfined		0.73
S-481	9/25/2024	--	15.92	--	0.60	unconfined		0.73
S-481	10/1/2024	--	16.05	--	0.47	unconfined		0.73
S-481	10/14/2024	--	16.47	--	0.05	unconfined		0.73
S-481	10/28/2024	--	16.81	--	-0.29	unconfined		0.73
S-481	11/8/2024	--	--	--	--	unconfined	Destroyed	0.73
S-482	12/22/2021	19.01	19.72	0.71	0.33	unconfined		0.73
S-482	12/30/2021	18.97	19.64	0.67	0.38	unconfined		0.73
S-482	1/4/2022	18.95	19.57	0.62	0.41	unconfined		0.73
S-482	1/12/2022	19.14	19.90	0.76	0.18	unconfined		0.73
S-482	1/25/2022	--	19.10	--	0.43	unconfined		0.73
S-482	2/8/2022	19.16	19.83	0.67	0.19	unconfined		0.73
S-482	2/11/2022	19.17	19.83	0.66	0.18	unconfined		0.73
S-482	2/14/2022	19.25	19.97	0.72	0.08	unconfined		0.73
S-482	2/24/2022	19.31	20.09	0.78	0.01	unconfined		0.73
S-482	2/28/2022	19.03	19.97	0.94	0.24	unconfined		0.73
S-482	3/17/2022	19.37	20.19	0.82	-0.06	unconfined		0.73
S-482	3/24/2022	19.25	19.92	0.67	0.10	unconfined		0.73
S-482	3/31/2022	19.21	19.77	0.56	0.17	unconfined		0.73
S-482	4/8/2022	19.25	19.92	0.67	0.10	unconfined		0.73
S-482	4/12/2022	18.64	19.05	0.41	0.78	unconfined		0.73
S-482	4/19/2022	18.70	19.07	0.37	0.73	unconfined		0.73
S-482	4/25/2022	18.63	19.04	0.41	0.79	unconfined		0.73
S-482	5/2/2022	18.77	19.27	0.50	0.62	unconfined		0.73
S-482	5/9/2022	18.58	18.89	0.31	0.87	unconfined		0.73
S-482	5/26/2022	18.60	19.00	0.40	0.82	unconfined		0.73
S-482	6/15/2022	18.36	18.69	0.33	1.08	unconfined		0.73
S-482	7/14/2022	18.75	19.17	0.42	0.67	unconfined		0.73
S-482	7/18/2022	18.77	19.20	0.43	0.64	unconfined		0.73
S-482	7/26/2022	18.95	19.50	0.55	0.43	unconfined		0.73
S-482	8/1/2022	19.02	19.60	0.58	0.35	unconfined		0.73
S-482	8/9/2022	19.12	19.75	0.63	0.24	unconfined		0.73

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-482	8/24/2022	19.03	19.54	0.51	0.36	unconfined		0.73
S-482	8/29/2022	19.13	19.68	0.55	0.25	unconfined		0.73
S-482	9/8/2022	19.07	19.51	0.44	0.34	unconfined		0.73
S-482	9/22/2022	19.09	19.58	0.49	0.31	unconfined		0.73
S-482	9/28/2022	19.26	19.93	0.67	0.09	unconfined		0.73
S-482	10/5/2022	18.81	19.06	0.25	0.65	unconfined		0.73
S-482	10/13/2022	18.93	19.23	0.30	0.52	unconfined		0.73
S-482	10/20/2022	18.95	19.35	0.40	0.47	unconfined		0.73
S-482	10/27/2022	19.05	19.40	0.35	0.38	unconfined		0.73
S-482	11/1/2022	19.05	19.30	0.25	0.41	unconfined		0.73
S-482	11/10/2022	19.20	19.80	0.60	0.17	unconfined		0.73
S-482	11/16/2022	19.24	19.81	0.57	0.13	unconfined		0.73
S-482	11/22/2022	19.31	20.03	0.72	0.02	unconfined		0.73
S-482	11/30/2022	19.30	19.88	0.58	0.07	unconfined		0.73
S-482	12/14/2022	17.70	17.99	0.29	1.75	unconfined		0.73
S-482	12/21/2022	17.36	17.55	0.19	2.12	unconfined		0.73
S-482	12/28/2022	17.38	17.68	0.30	2.07	unconfined		0.73
S-482	1/3/2023	17.34	17.62	0.28	2.11	unconfined		0.73
S-482	1/10/2023	17.30	17.51	0.21	2.17	unconfined		0.73
S-482	1/19/2023	17.30	17.51	0.21	2.17	unconfined		0.73
S-482	1/26/2023	17.75	17.93	0.18	1.73	unconfined		0.73
S-482	1/31/2023	18.20	18.30	0.10	1.30	unconfined		0.73
S-482	2/7/2023	18.82	18.84	0.02	0.70	unconfined		0.73
S-482	2/16/2023	18.85	18.95	0.10	0.65	unconfined		0.73
S-482	2/28/2023	18.85	18.90	0.05	0.67	unconfined		0.73
S-482	3/7/2023	18.81	18.83	0.02	0.71	unconfined		0.73
S-482	3/16/2023	19.01	19.20	0.19	0.47	unconfined		0.73
S-482	3/23/2023	19.10	19.44	0.34	0.34	unconfined		0.73
S-482	3/29/2023	19.10	19.42	0.32	0.34	unconfined		0.73
S-482	4/5/2023	19.20	19.58	0.38	0.23	unconfined		0.73
S-482	4/13/2023	19.25	19.61	0.36	0.18	unconfined		0.73
S-482	4/19/2023	19.23	19.58	0.35	0.20	unconfined		0.73
S-482	4/26/2023	19.28	19.58	0.30	0.17	unconfined		0.73
S-482	5/3/2023	18.55	18.56	0.01	0.98	unconfined		0.73
S-482	5/10/2023	18.70	18.73	0.03	0.82	unconfined		0.73
S-482	5/16/2023	18.94	18.95	0.01	0.59	unconfined		0.73
S-482	5/23/2023	19.10	19.13	0.03	0.42	unconfined		0.73
S-482	5/31/2023	19.17	19.43	0.26	0.29	unconfined		0.73
S-482	6/7/2023	19.11	19.15	0.04	0.41	unconfined		0.73
S-482	6/20/2023	19.22	19.43	0.21	0.25	unconfined		0.73
S-482	6/27/2023	19.09	19.16	0.07	0.42	unconfined		0.73
S-482	7/19/2023	--	18.24	--	1.29	unconfined		0.73
S-482	7/26/2023	--	18.12	--	1.41	unconfined		0.73
S-482	8/2/2023	--	18.30	--	1.23	unconfined		0.73
S-482	8/9/2023	--	18.20	--	1.33	unconfined		0.73
S-482	8/23/2023	--	18.20	--	1.33	unconfined		0.73
S-482	8/30/2023	--	18.45	--	1.08	unconfined		0.73
S-482	9/5/2023	--	18.63	--	0.90	unconfined		0.73
S-482	9/15/2023	--	18.70	--	0.83	unconfined		0.73
S-482	9/20/2023	--	18.62	--	0.91	unconfined		0.73
S-482	9/27/2023	--	18.04	--	1.49	unconfined		0.73
S-482	10/4/2023	--	18.02	--	1.51	unconfined		0.73
S-482	10/17/2023	--	18.32	--	1.21	unconfined		0.73
S-482	10/26/2023	--	18.68	--	0.85	unconfined		0.73
S-482	11/1/2023	--	18.71	--	0.82	unconfined		0.73
S-482	11/9/2023	--	18.77	--	0.76	unconfined		0.73
S-482	11/13/2023	--	18.93	--	0.60	unconfined		0.73
S-482	11/22/2023	--	18.93	--	0.60	unconfined		0.73
S-482	11/29/2023	--	18.90	--	0.63	unconfined		0.73
S-482	12/14/2023	--	16.51	--	3.02	unconfined		0.73
S-482	12/20/2023	--	17.51	--	2.02	unconfined		0.73
S-482	1/3/2024	--	17.50	--	2.03	unconfined		0.73
S-482	1/11/2024	--	16.95	--	2.58	unconfined		0.73
S-482	1/24/2024	--	17.74	--	1.79	unconfined		0.73
S-482	1/30/2024	--	17.30	--	2.23	unconfined		0.73
S-482	2/5/2024	--	17.30	--	2.23	unconfined		0.73
S-482	2/15/2024	--	17.79	--	1.74	unconfined		0.73

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Bellwether District Holdings, LLC, Philadelphia, PA

Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-482	2/21/2024	--	18.08	--	1.45	unconfined		0.73
S-482	2/28/2024	--	18.12	--	1.41	unconfined		0.73
S-482	3/5/2024	--	18.16	--	1.37	unconfined		0.73
S-482	3/20/2024	--	17.73	--	1.80	unconfined		0.73
S-482	3/28/2024	--	17.22	--	2.31	unconfined		0.73
S-482	4/3/2024	--	17.11	--	2.42	unconfined		0.73
S-482	4/9/2024	--	16.67	--	2.86	unconfined		0.73
S-482	4/25/2024	--	17.40	--	2.13	unconfined		0.73
S-482	4/30/2024	--	17.46	--	2.07	unconfined		0.73
S-482	5/8/2024	--	17.63	--	1.90	unconfined		0.73
S-482	5/20/2024	--	17.83	--	1.70	unconfined		0.73
S-482	5/31/2024	--	18.11	--	1.42	unconfined		0.73
S-482	6/5/2024	--	18.24	--	1.29	unconfined		0.73
S-482	6/12/2024	--	18.18	--	1.35	unconfined		0.73
S-482	6/19/2024	--	16.40	--	3.13	unconfined		0.73
S-482	6/26/2024	--	18.52	--	1.01	unconfined		0.73
S-482	7/2/2024	--	18.40	--	1.13	unconfined		0.73
S-482	7/10/2024	--	18.10	--	1.43	unconfined		0.73
S-482	7/16/2024	--	18.23	--	1.30	unconfined		0.73
S-482	7/24/2024	--	18.40	--	1.13	unconfined		0.73
S-482	8/1/2024	--	18.62	--	0.91	unconfined		0.73
S-482	8/6/2024	--	18.68	--	0.85	unconfined		0.73
S-482	8/23/2024	--	17.77	--	1.76	unconfined		0.73
S-482	8/28/2024	--	17.96	--	1.57	unconfined		0.73
S-482	9/4/2024	--	18.22	--	1.31	unconfined		0.73
S-482	9/11/2024	--	18.42	--	1.11	unconfined		0.73
S-482	9/18/2024	--	18.48	--	1.05	unconfined		0.73
S-482	9/25/2024	--	18.33	--	1.20	unconfined		0.73
S-482	10/1/2024	--	18.49	--	1.04	unconfined		0.73
S-482	10/14/2024	--	18.95	--	0.58	unconfined		0.73
S-482	10/28/2024	--	19.35	--	0.18	unconfined		0.73
S-482	11/8/2024	19.50	19.75	0.25	-0.04	unconfined		0.73
S-482	11/15/2024	--	--	--	--	unconfined	Unable to locate	0.73
S-482	11/26/2024	19.53	19.88	0.35	-0.10	unconfined		0.73
S-482	12/4/2024	19.60	19.92	0.32	-0.16	unconfined		0.73
S-482	12/11/2024	19.53	19.90	0.37	-0.10	unconfined		0.73
S-482	12/17/2024	19.43	19.54	0.11	0.07	unconfined		0.73
S-482	1/8/2025	--	--	--	--	unconfined	Unable to access	0.73
S-482	1/8/2025	--	--	--	--	unconfined		0.73
S-482	1/16/2025	19.51	19.80	0.29	-0.06	unconfined		0.73
S-482	1/16/2025	19.51	19.80	0.29	-0.06	unconfined		0.73
S-482	1/24/2025	19.61	20.05	0.44	-0.20	unconfined		0.73
S-482	1/24/2025	19.61	20.05	0.44	-0.20	unconfined		0.73
S-482	1/29/2025	19.65	20.18	0.53	-0.26	unconfined		0.73
S-482	2/5/2025	19.65	20.13	0.48	-0.25	unconfined		0.73
S-482	2/5/2025	19.65	20.13	0.48	-0.25	unconfined		0.73
S-482	2/12/2025	--	--	--	--	unconfined	Unable to access	0.73
S-482	2/12/2025	--	--	--	--	unconfined		0.73
S-482	2/20/2025	--	19.70	--	-0.17	unconfined		0.73
S-482	2/20/2025	--	19.70	--	-0.17	unconfined		0.73
S-482	3/13/2025	--	19.30	--	0.23	unconfined		0.73
S-482	3/26/2025	--	18.30	--	1.23	unconfined		0.73
S-482	4/10/2025	--	18.10	--	1.43	unconfined		0.73
S-482	4/14/2025	--	17.83	--	1.70	unconfined		0.73
S-482	4/23/2025	--	18.03	--	1.50	unconfined		0.73
S-482	5/6/2025	--	17.72	--	1.81	unconfined		0.73
S-483	12/22/2021	12.19	12.75	0.56	0.09	unconfined		0.71
S-483	12/30/2021	12.12	13.08	0.96	0.04	unconfined		0.71
S-483	1/4/2022	12.07	12.97	0.90	0.11	unconfined		0.71
S-483	1/12/2022	12.16	13.35	1.19	-0.07	unconfined		0.71
S-483	1/25/2022	12.11	13.10	0.99	0.04	unconfined		0.71
S-483	2/8/2022	12.12	12.92	0.80	0.09	unconfined		0.71
S-483	2/14/2022	12.20	13.18	0.98	-0.05	unconfined		0.71
S-483	2/24/2022	12.26	13.23	0.97	-0.10	unconfined		0.71
S-483	2/28/2022	12.20	13.15	0.95	-0.04	unconfined		0.71
S-483	3/17/2022	12.31	13.45	1.14	-0.20	unconfined		0.71

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Bellwether District Holdings, LLC, Philadelphia, PA

Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-483	3/24/2022	12.23	13.12	0.89	-0.05	unconfined		0.71
S-483	4/8/2022	12.22	13.02	0.80	-0.01	unconfined		0.71
S-483	4/12/2022	11.75	11.90	0.15	0.65	unconfined		0.71
S-483	4/19/2022	--	11.82	--	0.62	unconfined		0.71
S-483	4/25/2022	--	11.80	--	0.64	unconfined		0.71
S-483	5/2/2022	--	11.94	--	0.50	unconfined		0.71
S-483	5/9/2022	--	11.72	--	0.72	unconfined		0.71
S-483	5/26/2022	--	11.78	--	0.66	unconfined		0.71
S-483	6/15/2022	--	11.61	--	0.83	unconfined		0.71
S-483	7/14/2022	--	11.95	--	0.49	unconfined		0.71
S-483	7/18/2022	--	12.10	--	0.34	unconfined		0.71
S-483	7/26/2022	--	12.21	--	0.23	unconfined		0.71
S-483	8/1/2022	--	12.30	--	0.14	unconfined		0.71
S-483	8/9/2022	12.37	12.55	0.18	0.02	unconfined		0.71
S-483	8/24/2022	12.27	12.82	0.55	0.01	unconfined		0.71
S-483	8/29/2022	12.33	13.01	0.68	-0.09	unconfined		0.71
S-483	9/8/2022	12.34	12.94	0.60	-0.08	unconfined		0.71
S-483	9/22/2022	12.30	13.00	0.70	-0.06	unconfined		0.71
S-483	9/28/2022	12.47	13.25	0.78	-0.26	unconfined		0.71
S-483	10/5/2022	12.17	12.32	0.15	0.23	unconfined		0.71
S-483	10/13/2022	12.11	12.48	0.37	0.22	unconfined		0.71
S-483	10/20/2022	12.17	12.56	0.39	0.16	unconfined		0.71
S-483	10/27/2022	12.23	12.72	0.49	0.07	unconfined		0.71
S-483	11/1/2022	12.28	12.83	0.55	0.00	unconfined		0.71
S-483	11/10/2022	12.39	13.10	0.71	-0.16	unconfined		0.71
S-483	11/16/2022	12.40	13.11	0.71	-0.17	unconfined		0.71
S-483	11/22/2022	12.46	13.29	0.83	-0.26	unconfined		0.71
S-483	11/30/2022	12.46	13.20	0.74	-0.24	unconfined		0.71
S-483	12/14/2022	--	11.54	--	0.90	unconfined		0.71
S-483	12/21/2022	--	11.05	--	1.39	unconfined		0.71
S-483	12/28/2022	--	10.95	--	1.49	unconfined		0.71
S-483	1/3/2023	--	10.94	--	1.50	unconfined		0.71
S-483	1/10/2023	10.83	10.88	0.05	1.60	unconfined		0.71
S-483	1/19/2023	10.88	11.00	0.12	1.52	unconfined		0.71
S-483	1/26/2023	10.89	11.13	0.24	1.48	unconfined		0.71
S-483	1/31/2023	11.16	11.20	0.04	1.27	unconfined		0.71
S-483	2/7/2023	11.60	11.65	0.05	0.83	unconfined		0.71
S-483	2/16/2023	11.86	11.88	0.02	0.57	unconfined		0.71
S-483	2/28/2023	--	11.98	--	0.46	unconfined		0.71
S-483	3/7/2023	--	11.88	--	0.56	unconfined		0.71
S-483	3/16/2023	--	12.05	--	0.39	unconfined		0.71
S-483	3/23/2023	--	12.18	--	0.26	unconfined		0.71
S-483	3/29/2023	--	12.14	--	0.30	unconfined		0.71
S-483	4/5/2023	--	12.23	--	0.21	unconfined		0.71
S-483	4/13/2023	--	12.31	--	0.13	unconfined		0.71
S-483	4/19/2023	--	12.33	--	0.11	unconfined		0.71
S-483	4/26/2023	--	12.36	--	0.08	unconfined		0.71
S-483	5/3/2023	--	11.78	--	0.66	unconfined		0.71
S-483	5/10/2023	--	11.76	--	0.68	unconfined		0.71
S-483	5/16/2023	--	11.91	--	0.53	unconfined		0.71
S-483	5/23/2023	--	12.10	--	0.34	unconfined		0.71
S-483	5/31/2023	--	12.23	--	0.21	unconfined		0.71
S-483	6/7/2023	--	12.30	--	0.14	unconfined		0.71
S-483	6/20/2023	--	12.38	--	0.06	unconfined		0.71
S-483	6/27/2023	--	12.29	--	0.15	unconfined		0.71
S-483	7/19/2023	--	11.45	--	0.99	unconfined		0.71
S-483	7/26/2023	--	11.25	--	1.19	unconfined		0.71
S-483	8/2/2023	--	11.33	--	1.11	unconfined		0.71
S-483	8/9/2023	--	11.33	--	1.11	unconfined		0.71
S-483	8/23/2023	--	11.50	--	0.94	unconfined		0.71
S-483	8/30/2023	--	11.60	--	0.84	unconfined		0.71
S-483	9/5/2023	--	11.81	--	0.63	unconfined		0.71
S-483	9/15/2023	--	11.78	--	0.66	unconfined		0.71
S-483	9/20/2023	--	11.73	--	0.71	unconfined		0.71
S-483	9/27/2023	--	11.37	--	1.07	unconfined		0.71
S-483	10/4/2023	--	11.38	--	1.06	unconfined		0.71
S-483	10/17/2023	--	11.44	--	1.00	unconfined		0.71

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-483	10/26/2023	--	11.73	--	0.71	unconfined		0.71
S-483	11/1/2023	--	11.85	--	0.59	unconfined		0.71
S-483	11/9/2023	--	11.95	--	0.49	unconfined		0.71
S-483	11/13/2023	--	12.05	--	0.39	unconfined		0.71
S-483	11/22/2023	--	12.10	--	0.34	unconfined		0.71
S-483	11/29/2023	--	12.03	--	0.41	unconfined		0.71
S-483	12/14/2023	--	11.73	--	0.71	unconfined		0.71
S-483	12/20/2023	--	11.35	--	1.09	unconfined		0.71
S-483	1/3/2024	--	10.75	--	1.69	unconfined		0.71
S-483	1/11/2024	--	10.47	--	1.97	unconfined		0.71
S-483	1/24/2024	--	10.75	--	1.69	unconfined		0.71
S-483	1/30/2024	--	10.40	--	2.04	unconfined		0.71
S-483	2/5/2024	--	10.37	--	2.07	unconfined		0.71
S-483	2/15/2024	--	10.69	--	1.75	unconfined		0.71
S-483	2/21/2024	--	10.93	--	1.51	unconfined		0.71
S-483	2/28/2024	--	11.05	--	1.39	unconfined		0.71
S-483	3/5/2024	--	--	--	--	unconfined	Destroyed	0.71
S-484	3/2/2022	17.46	18.58	1.12	-0.10	unconfined		0.73
S-484	3/17/2022	17.75	18.89	1.14	-0.39	unconfined		0.73
S-484	3/24/2022	17.54	18.63	1.09	-0.17	unconfined		0.73
S-484	3/31/2022	17.50	18.61	1.11	-0.13	unconfined		0.73
S-484	4/8/2022	17.50	18.59	1.09	-0.13	unconfined		0.73
S-484	4/12/2022	16.87	17.92	1.05	0.51	unconfined		0.73
S-484	4/19/2022	16.87	17.91	1.04	0.52	unconfined		0.73
S-484	4/25/2022	16.86	17.87	1.01	0.53	unconfined		0.73
S-484	5/2/2022	17.01	18.12	1.11	0.36	unconfined		0.73
S-484	5/9/2022	16.81	17.79	0.98	0.59	unconfined		0.73
S-484	5/26/2022	16.85	17.87	1.02	0.54	unconfined		0.73
S-484	6/15/2022	16.61	17.43	0.82	0.84	unconfined		0.73
S-484	7/14/2022	17.00	17.99	0.99	0.40	unconfined		0.73
S-484	7/18/2022	17.05	17.95	0.90	0.37	unconfined		0.73
S-484	7/26/2022	17.25	18.29	1.04	0.14	unconfined		0.73
S-484	8/1/2022	17.24	18.31	1.07	0.14	unconfined		0.73
S-484	8/9/2022	17.45	18.57	1.12	-0.09	unconfined		0.73
S-484	8/24/2022	17.32	18.37	1.05	0.06	unconfined		0.73
S-484	8/29/2022	17.42	18.50	1.08	-0.05	unconfined		0.73
S-484	9/8/2022	17.40	18.41	1.01	-0.01	unconfined		0.73
S-484	9/22/2022	17.39	18.40	1.01	0.00	unconfined		0.73
S-484	9/28/2022	17.60	18.59	0.99	-0.20	unconfined		0.73
S-484	10/5/2022	17.01	17.81	0.80	0.44	unconfined		0.73
S-484	10/13/2022	17.20	18.10	0.90	0.22	unconfined		0.73
S-484	10/20/2022	17.30	18.21	0.91	0.12	unconfined		0.73
S-484	10/27/2022	17.35	18.28	0.93	0.07	unconfined		0.73
S-484	11/1/2022	17.35	18.30	0.95	0.06	unconfined		0.73
S-484	11/10/2022	17.59	18.50	0.91	-0.17	unconfined		0.73
S-484	11/16/2022	17.55	18.44	0.89	-0.12	unconfined		0.73
S-484	11/22/2022	17.72	18.61	0.89	-0.29	unconfined		0.73
S-484	11/30/2022	17.62	18.45	0.83	-0.18	unconfined		0.73
S-484	12/14/2022	15.72	16.25	0.53	1.81	unconfined		0.73
S-484	12/21/2022	15.36	16.25	0.89	2.07	unconfined		0.73
S-484	12/28/2022	15.35	16.19	0.84	2.09	unconfined		0.73
S-484	1/3/2023	15.33	16.12	0.79	2.12	unconfined		0.73
S-484	1/10/2023	15.30	15.84	0.54	2.22	unconfined		0.73
S-484	1/19/2023	15.30	15.86	0.56	2.22	unconfined		0.73
S-484	1/26/2023	15.96	16.73	0.77	1.50	unconfined		0.73
S-484	1/31/2023	16.49	17.03	0.54	1.03	unconfined		0.73
S-484	2/7/2023	17.18	17.45	0.27	0.42	unconfined		0.73
S-484	2/16/2023	17.23	17.37	0.14	0.40	unconfined		0.73
S-484	2/28/2023	17.20	17.25	0.05	0.46	unconfined		0.73
S-484	3/7/2023	17.24	17.25	0.01	0.43	unconfined		0.73
S-484	3/16/2023	17.48	17.50	0.02	0.18	unconfined		0.73
S-484	3/23/2023	17.45	17.79	0.34	0.13	unconfined		0.73
S-484	3/29/2023	17.45	17.74	0.29	0.14	unconfined		0.73
S-484	4/5/2023	17.53	18.05	0.52	0.00	unconfined		0.73
S-484	4/13/2023	17.57	18.04	0.47	-0.03	unconfined		0.73
S-484	4/19/2023	17.58	18.07	0.49	-0.04	unconfined		0.73
S-484	4/26/2023	17.61	18.05	0.44	-0.06	unconfined		0.73

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-484	5/3/2023	--	16.95	--	0.72	unconfined		0.73
S-484	5/10/2023	--	17.15	--	0.52	unconfined		0.73
S-484	5/16/2023	--	17.35	--	0.32	unconfined		0.73
S-484	5/23/2023	--	17.51	--	0.16	unconfined		0.73
S-484	5/31/2023	--	17.62	--	0.05	unconfined		0.73
S-484	6/7/2023	--	17.59	--	0.08	unconfined		0.73
S-484	6/20/2023	--	17.73	--	-0.06	unconfined		0.73
S-484	6/27/2023	--	17.52	--	0.15	unconfined		0.73
S-484	7/19/2023	--	16.66	--	1.01	unconfined		0.73
S-484	7/26/2023	--	16.50	--	1.17	unconfined		0.73
S-484	8/2/2023	--	16.74	--	0.93	unconfined		0.73
S-484	8/9/2023	--	16.61	--	1.06	unconfined		0.73
S-484	8/23/2023	--	16.87	--	0.80	unconfined		0.73
S-484	8/30/2023	--	16.92	--	0.75	unconfined		0.73
S-484	9/5/2023	--	17.08	--	0.59	unconfined		0.73
S-484	9/15/2023	--	17.08	--	0.59	unconfined		0.73
S-484	9/20/2023	--	17.03	--	0.64	unconfined		0.73
S-484	9/27/2023	--	16.44	--	1.23	unconfined		0.73
S-484	10/4/2023	--	16.50	--	1.17	unconfined		0.73
S-484	10/17/2023	--	16.76	--	0.91	unconfined		0.73
S-484	10/26/2023	--	17.12	--	0.55	unconfined		0.73
S-484	11/1/2023	17.10	17.11	0.01	0.57	unconfined		0.73
S-484	11/9/2023	--	17.16	--	0.51	unconfined		0.73
S-484	11/13/2023	--	17.38	--	0.29	unconfined		0.73
S-484	11/22/2023	--	17.28	--	0.39	unconfined		0.73
S-484	11/29/2023	--	17.35	--	0.32	unconfined		0.73
S-484	12/14/2023	--	17.00	--	0.67	unconfined		0.73
S-484	12/20/2023	--	16.02	--	1.65	unconfined		0.73
S-484	1/3/2024	--	15.94	--	1.73	unconfined		0.73
S-484	1/11/2024	--	15.40	--	2.27	unconfined		0.73
S-484	1/24/2024	--	16.19	--	1.48	unconfined		0.73
S-484	1/30/2024	--	15.67	--	2.00	unconfined		0.73
S-484	2/5/2024	--	15.64	--	2.03	unconfined		0.73
S-484	2/15/2024	16.15	16.16	0.01	1.52	unconfined		0.73
S-484	2/21/2024	--	16.39	--	1.28	unconfined		0.73
S-484	2/28/2024	--	16.37	--	1.30	unconfined		0.73
S-484	3/5/2024	--	16.48	--	1.19	unconfined		0.73
S-484	3/20/2024	--	16.10	--	1.57	unconfined		0.73
S-484	3/28/2024	--	15.57	--	2.10	unconfined		0.73
S-484	4/3/2024	--	15.60	--	2.07	unconfined		0.73
S-484	4/9/2024	--	15.13	--	2.54	unconfined		0.73
S-484	4/25/2024	--	15.78	--	1.89	unconfined		0.73
S-484	4/30/2024	--	15.85	--	1.82	unconfined		0.73
S-484	5/8/2024	--	16.06	--	1.61	unconfined		0.73
S-484	5/20/2024	--	16.25	--	1.42	unconfined		0.73
S-484	5/31/2024	--	16.57	--	1.10	unconfined		0.73
S-484	6/5/2024	--	16.70	--	0.97	unconfined		0.73
S-484	6/12/2024	--	15.56	--	2.11	unconfined		0.73
S-484	6/19/2024	--	16.82	--	0.85	unconfined		0.73
S-484	6/26/2024	--	16.90	--	0.77	unconfined		0.73
S-484	7/2/2024	--	16.80	--	0.87	unconfined		0.73
S-484	7/10/2024	--	16.54	--	1.13	unconfined		0.73
S-484	7/16/2024	--	16.64	--	1.03	unconfined		0.73
S-484	7/24/2024	--	16.84	--	0.83	unconfined		0.73
S-484	8/1/2024	--	17.08	--	0.59	unconfined		0.73
S-484	8/6/2024	--	17.05	--	0.62	unconfined		0.73
S-484	8/23/2024	--	16.28	--	1.39	unconfined		0.73
S-484	8/28/2024	--	16.45	--	1.22	unconfined		0.73
S-484	9/4/2024	--	16.74	--	0.93	unconfined		0.73
S-484	9/11/2024	--	16.89	--	0.78	unconfined		0.73
S-484	9/18/2024	--	16.96	--	0.71	unconfined		0.73
S-484	9/25/2024	--	16.91	--	0.76	unconfined		0.73
S-484	10/1/2024	--	16.99	--	0.68	unconfined		0.73
S-484	10/14/2024	17.35	17.42	0.07	0.30	unconfined		0.73
S-484	10/28/2024	--	17.66	--	0.01	unconfined		0.73
S-484	11/8/2024	--	17.94	--	-0.27	unconfined		0.73
S-484	11/15/2024	--	17.99	--	-0.32	unconfined		0.73

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Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-484	11/20/2024	--	17.99	--	-0.32	unconfined		0.73
S-484	11/26/2024	--	--	--	--	unconfined	Unable to access	0.73
S-484	12/4/2024	--	18.10	--	-0.43	unconfined		0.73
S-484	12/11/2024	--	18.05	--	-0.38	unconfined		0.73
S-484	12/17/2024	--	17.90	--	-0.23	unconfined		0.73
S-484	1/8/2025	--	17.83	--	-0.16	unconfined		0.73
S-484	1/8/2025	--	17.83	--	-0.16	unconfined		0.73
S-484	1/16/2025	--	18.02	--	-0.35	unconfined		0.73
S-484	1/16/2025	--	18.02	--	-0.35	unconfined		0.73
S-484	1/24/2025	--	18.09	--	-0.42	unconfined		0.73
S-484	1/24/2025	--	18.09	--	-0.42	unconfined		0.73
S-484	1/29/2025	--	18.29	--	-0.62	unconfined		0.73
S-484	1/29/2025	--	18.29	--	-0.62	unconfined		0.73
S-484	2/5/2025	--	18.26	--	-0.59	unconfined		0.73
S-484	2/5/2025	--	18.26	--	-0.59	unconfined		0.73
S-484	2/12/2025	--	18.24	--	-0.57	unconfined		0.73
S-484	2/12/2025	--	18.24	--	-0.57	unconfined		0.73
S-484	2/20/2025	--	18.15	--	-0.48	unconfined		0.73
S-484	2/20/2025	--	18.15	--	-0.48	unconfined		0.73
S-484	3/11/2025	--	17.74	--	-0.07	unconfined		0.73
S-484	3/26/2025	--	17.43	--	0.24	unconfined		0.73
S-484	4/10/2025	--	17.01	--	0.66	unconfined		0.73
S-484	4/14/2025	--	16.76	--	0.91	unconfined		0.73
S-484	4/23/2025	--	16.84	--	0.83	unconfined		0.73
S-484	5/6/2025	--	17.09	--	0.58	unconfined		0.73
S-485	3/2/2022	--	15.58	--	-0.14	unconfined		--
S-485	3/17/2022	--	15.85	--	-0.41	unconfined		--
S-485	3/24/2022	--	15.61	--	-0.17	unconfined		--
S-485	3/31/2022	--	15.60	--	-0.16	unconfined		--
S-485	4/8/2022	--	15.58	--	-0.14	unconfined		--
S-485	4/12/2022	--	15.04	--	0.40	unconfined		--
S-485	4/19/2022	--	14.74	--	0.70	unconfined		--
S-485	4/25/2022	--	15.02	--	0.42	unconfined		--
S-485	5/2/2022	--	15.14	--	0.30	unconfined		--
S-485	5/9/2022	--	14.88	--	0.56	unconfined		--
S-485	5/26/2022	--	15.00	--	0.44	unconfined		--
S-485	6/15/2022	--	14.74	--	0.70	unconfined		--
S-485	7/14/2022	--	15.11	--	0.33	unconfined		--
S-485	7/18/2022	--	15.15	--	0.29	unconfined		--
S-485	7/26/2022	--	15.37	--	0.07	unconfined		--
S-485	8/9/2022	--	15.56	--	-0.12	unconfined		--
S-485	8/24/2022	--	15.50	--	-0.06	unconfined		--
S-485	8/29/2022	--	15.60	--	-0.16	unconfined		--
S-485	9/8/2022	--	15.48	--	-0.04	unconfined		--
S-485	9/22/2022	--	15.50	--	-0.06	unconfined		--
S-485	9/28/2022	--	15.71	--	-0.27	unconfined		--
S-485	10/5/2022	--	15.21	--	0.23	unconfined		--
S-485	10/13/2022	--	15.30	--	0.14	unconfined		--
S-485	10/20/2022	--	15.40	--	0.04	unconfined		--
S-485	10/27/2022	--	15.43	--	0.01	unconfined		--
S-485	11/10/2022	--	15.64	--	-0.20	unconfined		--
S-485	11/16/2022	--	15.03	--	0.41	unconfined		--
S-485	11/22/2022	--	15.80	--	-0.36	unconfined		--
S-485	11/30/2022	--	15.69	--	-0.25	unconfined		--
S-485	12/14/2022	--	14.39	--	1.05	unconfined		--
S-485	12/21/2022	--	14.15	--	1.29	unconfined		--
S-485	12/28/2022	--	14.08	--	1.36	unconfined		--
S-485	1/3/2023	--	14.03	--	1.41	unconfined		--
S-485	1/10/2023	--	13.92	--	1.52	unconfined		--
S-485	1/19/2023	--	14.00	--	1.44	unconfined		--
S-485	1/26/2023	--	14.06	--	1.38	unconfined		--
S-485	1/31/2023	14.50	14.51	0.01	0.94	unconfined		--
S-485	2/7/2023	15.04	15.05	0.01	0.40	unconfined		--
S-485	2/16/2023	--	15.10	--	0.34	unconfined		--
S-485	2/28/2023	--	14.75	--	0.69	unconfined		--
S-485	3/7/2023	--	15.06	--	0.38	unconfined		--
S-485	3/16/2023	--	15.32	--	0.12	unconfined		--

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S-485	3/23/2023	--	15.33	--	0.11	unconfined		--
S-485	3/29/2023	--	15.35	--	0.09	unconfined		--
S-485	4/5/2023	--	15.42	--	0.02	unconfined		--
S-485	4/13/2023	--	15.49	--	-0.05	unconfined		--
S-485	4/19/2023	--	15.53	--	-0.09	unconfined		--
S-485	4/26/2023	--	15.55	--	-0.11	unconfined		--
S-485	5/3/2023	--	14.91	--	0.53	unconfined		--
S-485	5/10/2023	--	14.99	--	0.45	unconfined		--
S-485	5/16/2023	--	15.17	--	0.27	unconfined		--
S-485	5/31/2023	--	15.42	--	0.02	unconfined		--
S-485	6/7/2023	--	15.42	--	0.02	unconfined		--
S-485	6/20/2023	--	16.54	--	-1.10	unconfined		--
S-485	7/26/2023	--	14.36	--	1.08	unconfined		--
S-485	8/2/2023	--	14.48	--	0.96	unconfined		--
S-485	8/9/2023	--	14.46	--	0.98	unconfined		--
S-485	8/23/2023	--	14.68	--	0.76	unconfined		--
S-485	9/5/2023	--	14.90	--	0.54	unconfined		--
S-485	9/15/2023	--	14.90	--	0.54	unconfined		--
S-485	9/20/2023	--	14.85	--	0.59	unconfined		--
S-485	9/27/2023	--	14.38	--	1.06	unconfined		--
S-485	10/4/2023	--	14.37	--	1.07	unconfined		--
S-485	10/17/2023	--	14.58	--	0.86	unconfined		--
S-485	10/26/2023	--	14.92	--	0.52	unconfined		--
S-485	11/1/2023	--	14.70	--	0.74	unconfined		--
S-485	11/9/2023	--	14.98	--	0.46	unconfined		--
S-485	11/13/2023	--	15.22	--	0.22	unconfined		--
S-485	11/22/2023	--	14.56	--	0.88	unconfined		--
S-485	11/29/2023	--	15.19	--	0.25	unconfined		--
S-485	12/14/2023	--	14.88	--	0.56	unconfined		--
S-485	12/20/2023	--	14.21	--	1.23	unconfined		--
S-485	1/3/2024	--	13.88	--	1.56	unconfined		--
S-485	1/11/2024	--	13.50	--	1.94	unconfined		--
S-485	1/24/2024	--	--	--	--	unconfined	Unable to access	--
S-485	1/30/2024	--	13.35	--	2.09	unconfined		--
S-485	2/5/2024	--	13.46	--	1.98	unconfined		--
S-485	2/15/2024	--	13.91	--	1.53	unconfined		--
S-485	2/21/2024	--	14.18	--	1.26	unconfined		--
S-485	2/28/2024	--	14.16	--	1.28	unconfined		--
S-485	3/5/2024	--	14.30	--	1.14	unconfined		--
S-485	3/20/2024	--	13.94	--	1.50	unconfined		--
S-485	3/28/2024	--	--	--	--	unconfined	Unable to access	--
S-485	4/3/2024	--	13.45	--	1.99	unconfined		--
S-485	4/9/2024	--	13.12	--	2.32	unconfined		--
S-485	4/25/2024	--	13.63	--	1.81	unconfined		--
S-485	4/30/2024	--	13.69	--	1.75	unconfined		--
S-485	5/8/2024	--	13.84	--	1.60	unconfined		--
S-485	5/20/2024	--	14.02	--	1.42	unconfined		--
S-485	5/31/2024	--	14.38	--	1.06	unconfined		--
S-485	6/5/2024	--	14.46	--	0.98	unconfined		--
S-485	6/12/2024	--	14.42	--	1.02	unconfined		--
S-485	6/19/2024	--	14.65	--	0.79	unconfined		--
S-485	6/26/2024	--	14.75	--	0.69	unconfined		--
S-485	7/2/2024	--	14.71	--	0.73	unconfined		--
S-485	7/10/2024	--	14.45	--	0.99	unconfined		--
S-485	7/16/2024	--	14.48	--	0.96	unconfined		--
S-507	7/17/2023	--	11.09	--	0.21	lower aquifer		--
S-508	7/20/2023	--	17.20	--	0.30	lower aquifer		--
S-508	2/15/2024	--	17.22	--	0.63	lower aquifer		--
S-508	2/21/2024	--	16.55	--	1.30	lower aquifer		--
S-508	2/28/2024	--	17.13	--	0.72	lower aquifer		--
S-508	3/5/2024	--	16.65	--	1.20	lower aquifer		--
S-508	3/20/2024	--	16.38	--	1.47	lower aquifer		--
S-508	3/28/2024	--	16.67	--	1.18	lower aquifer		--
S-508	4/3/2024	--	15.63	--	2.22	lower aquifer		--
S-508	4/9/2024	--	16.78	--	1.07	lower aquifer		--
S-508	4/25/2024	--	17.02	--	0.83	lower aquifer		--
S-508	4/30/2024	--	16.24	--	1.61	lower aquifer		--

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Bellwether District Holdings, LLC, Philadelphia, PA

Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-508	5/8/2024	--	16.99	--	0.86	lower aquifer		--
S-508	5/20/2024	--	16.55	--	1.30	lower aquifer		--
S-508	5/31/2024	--	16.75	--	1.10	lower aquifer		--
S-508	6/5/2024	--	17.00	--	0.85	lower aquifer		--
S-508	6/12/2024	--	17.14	--	0.71	lower aquifer		--
S-508	6/19/2024	--	17.11	--	0.74	lower aquifer		--
S-508	6/26/2024	--	17.37	--	0.48	lower aquifer		--
S-508	7/2/2024	--	17.04	--	0.81	lower aquifer		--
S-508	7/10/2024	--	17.11	--	0.74	lower aquifer		--
S-508	7/16/2024	--	16.93	--	0.92	lower aquifer		--
S-508	7/24/2024	--	17.45	--	0.40	lower aquifer		--
S-508	8/1/2024	--	17.34	--	0.51	lower aquifer		--
S-508	8/6/2024	--	18.08	--	-0.23	lower aquifer		--
S-508	8/23/2024	--	17.28	--	0.57	lower aquifer		--
S-508	8/28/2024	--	16.72	--	1.13	lower aquifer		--
S-508	9/4/2024	--	17.67	--	0.18	lower aquifer		--
S-508	9/11/2024	--	17.32	--	0.53	lower aquifer		--
S-508	9/18/2024	--	17.91	--	-0.06	lower aquifer		--
S-508	9/25/2024	--	17.18	--	0.67	lower aquifer		--
S-508	10/1/2024	--	17.37	--	0.48	lower aquifer		--
S-508	10/14/2024	--	17.65	--	0.20	lower aquifer		--
S-508	10/28/2024	--	18.00	--	-0.15	lower aquifer		--
S-508	11/8/2024	--	18.50	--	-0.65	lower aquifer		--
S-508	11/15/2024	--	17.90	--	-0.05	lower aquifer		--
S-508	11/20/2024	--	18.63	--	-0.78	lower aquifer		--
S-508	11/26/2024	--	18.10	--	-0.25	lower aquifer		--
S-508	12/4/2024	--	18.39	--	-0.54	lower aquifer		--
S-508	12/11/2024	--	18.08	--	-0.23	lower aquifer		--
S-508	12/17/2024	--	18.18	--	-0.33	lower aquifer		--
S-508	1/8/2025	--	18.36	--	-0.51	lower aquifer		--
S-508	1/16/2025	--	18.14	--	-0.29	lower aquifer		--
S-508	1/24/2025	--	18.39	--	-0.54	lower aquifer		--
S-508	1/29/2025	--	18.28	--	-0.43	lower aquifer		--
S-508	2/5/2025	--	18.94	--	-1.09	lower aquifer		--
S-508	2/12/2025	--	18.40	--	-0.55	lower aquifer		--
S-508	2/20/2025	--	18.85	--	-1.00	lower aquifer		--
S-509	7/20/2023	--	15.00	--	0.31	lower aquifer		--
S-509	2/15/2024	--	14.35	--	0.96	lower aquifer		--
S-509	2/21/2024	--	14.08	--	1.23	lower aquifer		--
S-509	2/28/2024	--	14.22	--	1.09	lower aquifer		--
S-509	3/5/2024	--	14.14	--	1.17	lower aquifer		--
S-509	3/20/2024	--	13.93	--	1.38	lower aquifer		--
S-509	3/28/2024	--	13.95	--	1.36	lower aquifer		--
S-509	4/3/2024	--	13.16	--	2.15	lower aquifer		--
S-509	4/9/2024	--	13.65	--	1.66	lower aquifer		--
S-509	4/25/2024	--	14.12	--	1.19	lower aquifer		--
S-509	4/30/2024	--	13.64	--	1.67	lower aquifer		--
S-509	5/8/2024	--	13.88	--	1.43	lower aquifer		--
S-509	5/20/2024	--	14.00	--	1.31	lower aquifer		--
S-509	5/31/2024	--	14.31	--	1.00	lower aquifer		--
S-509	6/5/2024	--	14.38	--	0.93	lower aquifer		--
S-509	6/12/2024	--	14.45	--	0.86	lower aquifer		--
S-509	6/19/2024	--	14.64	--	0.67	lower aquifer		--
S-509	6/26/2024	--	14.68	--	0.63	lower aquifer		--

Table 3-2
Well Gauging Summary, 2018 to Present
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC, Philadelphia, PA

Well ID	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent LNAPL Thickness (ft)	Corrected Water Level Elevation (ft NAVD88)	Hydrostratigraphic Unit	Notes	Product Density
S-509	7/2/2024	--	14.62	--	0.69	lower aquifer		--
S-509	7/10/2024	--	14.43	--	0.88	lower aquifer		--
S-509	7/16/2024	--	14.42	--	0.89	lower aquifer		--

Notes:
ft = feet
btoc = below top of casing
NAVD88 = North American Vertical Datum of 1988
LNAPL = Light Non Aqueous Phase Liquid
-- = not applicable / not measured
NA = not available

Table 3-3
Groundwater Stabilized Purge Parameters, 2019 to Present
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Sample Location		BF-103R			BF-106			BF-99			C-129D		C-174			S-280		
Sample Date		2/26/2019	07/20/2023	6/3/2024	2/27/2019	9/10/2020	7/19/2023	2/27/2019	9/10/2020	07/19/2023	2/26/2019	9/2/2020	2/26/2019	9/9/2020	7/17/2023	2/27/2019	9/2/2020	7/17/2023
Sample ID		BF103R_20190226	BF103R_20230720	BF103R_20240603	BF-106_20190227	BF-106_20200910	BF-106_20230719	BF-99_20190227	BF-99_20200910	BF-99_20230719	c-129D_20190226	c-129D_20200902	c-174_20190226	C-174_20200909	C-174_20230717	S-_20190227	S-280_20200902	S-280_20230717
Hydrostratigraphic Unit		unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	lower aquifer	lower aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer
Field Parameters	**Units**																	
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	0.17	0	0	1.08	0.7	0	0	0.03	0	1.55	0.41	0.00	0.0	0	0.00	1.98	0
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	70	-116	-135	-133	-97	-88	-103	-76	-81	-52	8.83	-69	-95	-110	-144	--	15
pH, FIELD MEASURED	S.U.	6.45	6.12	6.61	8.4	7.79	6.29	7.91	7.8	6.24	10.84	0	7.00	7.86	6.24	7.03	6.07	6.33
SPECIFIC CONDUCTANCE FIELD	mS/cm	4.07	0.58	0.602	0.933	0.762	0.832	0.51	0.525	0.62	0.339	17.84	1.18	1.86	1.77	0.735	0.815	0.884
TEMPERATURE, FIELD MEASURED	deg c	11.12	18.75	16.52	10.97	18.84	15.77	11.2	22.12	16.23	34.6	0	13.46	17.08	19.64	14.64	19.65	19.26
TURBIDITY	NTU	29.8	2.6	0	146	127	13.6	300	88.4	3	13.12	--	1000	10.3	3.9	142	13.2	3.2

Notes:

µg/L	micrograms per liter
mg/L	milligrams per liter
mV	millivolts
S.U.	standard unit
mS/cm	milliSiemens per centimeter
deg c	degrees Celsius
NTU	nephelometric turbidity units
--	paramater not collected / unavailable

Table 3-3
Groundwater Stabilized Purge Parameters, 2019 to Present
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Sample Location		S-280D			S-283		S-284		S-284D		S-382						S-383	
Sample Date		2/26/2019	9/1/2020	7/17/2023	2/26/2019	7/21/2023	2/27/2019	9/3/2020	2/26/2019	9/1/2020	2/26/2019	7/21/2023	9/6/2024	11/7/2024	12/18/2024	2/3/2025	2/27/2019	9/9/2020
Sample ID		S-280D_20190226	S-280D_20200901	S-280D_20230717	S-283_20190226	S-283_20230721	S-284_20190227	S-284_20200903	S-284D_20190226	S-284D_20200901	S-382_20190226	S-382_SL_20230721	S-382_20240906	S-382_20241107	S-382_20241218	S-382_20250203	S-383_20190226	S-383_20200909
Hydrostratigraphic Unit		lower aquifer	lower aquifer	lower aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	lower aquifer	lower aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer
Field Parameters	**Units**																	
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	0.23	11.40	0	0.35	0.25	4.07	9.37	2.26	0.87	0	0	0	0	0	0.7	1.38	0.58
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	-65	--	60	-10	-133	66	--	-45	--	-47	-109	-153	-151	-112	-135	-80	-25
pH, FIELD MEASURED	S.U.	6.5	6.19	5.39	7.01	6.72	7.84	6.28	12.58	8.9	7.65	5.72	6.8	6.49	6.04	6.43	6.94	7.29
SPECIFIC CONDUCTANCE FIELD	mS/cm	0.579	0.772	0.503	0.4	0.295	0.474	0.387	2.41	0.735	0.2	0.679	0.429	0.469	0.666	0.75	0.361	0.321
TEMPERATURE, FIELD MEASURED	deg c	16.03	18.23	18.8	14.87	22.85	7.70	23.88	64.3	21.62	13.47	21.99	20.29	21.92	21	19.09	8.95	21.1
TURBIDITY	NTU	13.7	14.5	1.4	1000	226	6.6	0	11.89	0	0	26.3	6.38	15.4	31.4	82.1	37	210

Notes:

µg/L	micrograms per liter
mg/L	milligrams per liter
mV	millivolts
S.U.	standard unit
mS/cm	milliSiemens per centimeter
deg c	degrees Celsius
NTU	nephelometric turbidity units
--	paramater not collected / unavailable

Table 3-3
Groundwater Stabilized Purge Parameters, 2019 to Present
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Sample Location		S-411			S-412		S-413		S-414							S-428		
Sample Date		2/27/2019	9/2/2020	7/17/2023	2/27/2019	9/9/2020	2/26/2019	9/2/2020	2/26/2019	7/18/2023	9/5/2024	10/8/2024	11/7/2024	12/18/2024	2/3/2025	2/27/2019	9/3/2020	7/18/2023
Sample ID		S-411_20190227	S-411_20200902	S-411_20230717	S-412_20190227	S-412_20200909	S-413_20190226	S-413_20200902	S-414_20190226	S-414_20230718	S-414_20240905	S-414_20241008	S-414_20241107	S-414_20241218	S-414_20250203	S-428_20190227	S-428_20200903	S-428_20230718
Hydrostratigraphic Unit	Units	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer
Field Parameters																		
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	0.70	0.06	5.6	0.00	0.47	0.05	6.68	0	0	0	0.54	0.77	0.36	0.52	0.00	6.64	0
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	-91	--	137	-151	-123	-120	--	-69	-111	-138	-128	-90	-103	-132	-200	--	-61
pH, FIELD MEASURED	S.U.	6.77	6.06	5.76	7.06	7.59	6.91	6.09	7.6	6.51	6.66	6.73	6.4	6.26	6.45	9.49	5.74	5.83
SPECIFIC CONDUCTANCE FIELD	mS/cm	0.496	0.762	0.656	14.08	1.53	0.990	1.07	0.44	0.408	0.543	0.491	0.434	0.512	0.433	0.800	0.598	0.288
TEMPERATURE, FIELD MEASURED	deg c	13.03	21.68	19.89	1.15	20.54	13.02	21.31	15.62	23.18	21.86	20.37	21.08	19.97	17.88	12.87	27.99	22.15
TURBIDITY	NTU	17.4	135	30.1	21.5	1.4	87.4	21.7	233	12.9	88	80.1	97.8	89.9	70.2	67.4	0	3.1

Notes:

µg/L	micrograms per liter
mg/L	milligrams per liter
mV	millivolts
S.U.	standard unit
mS/cm	milliSiemens per centimeter
deg c	degrees Celsius
NTU	nephelometric turbidity units
--	paramater not collected / unavailable

Table 3-3
Groundwater Stabilized Purge Parameters, 2019 to Present
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Sample Location		S-429							S-430				S-431			s-433			S-434	
Sample Date		2/26/2019	7/18/2023	9/6/2024	10/8/2024	11/7/2024	12/19/2024	2/3/2025	2/26/2019	7/18/2023	6/3/2024	9/10/2024	2/26/2019	7/18/2023	9/10/2024	9/3/2020	9/9/2020	7/18/2023	9/9/2020	7/19/2023
Sample ID		S-429_20190226	S-429_20230718	S-429_20240906	S-429_20241008	S-429_20241107	S-429_20241219	S-42920250203	S-430_20190226	S-430_20230718	S-430_20240603	S-430_202400910	S-431_20190226	S-431_20230718	S-431_20240910	S-433_20203909	S-433_20200909	S-433_20230718	S-434_20200909	S-434_20230719
Hydrostratigraphic Unit		unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer
Field Parameters	**Units**																			
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	0	0	0	0.37	1.9	0.16	0.57	--	0	0	6.46	--	0	0.7	5.21	0.18	0	0.35	0
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	-29	-138	-158	-168	-149	-133	-139	--	-84	-103	-63	--	-24	-111	--	-63	-71	208	66
pH, FIELD MEASURED	S.U.	8.37	6.76	6.94	7.01	6.63	6.89	6.56	--	6.22	6.89	6.53	--	5.96	6.79	6.4	7.54	6.36	6.85	5.73
SPECIFIC CONDUCTANCE FIELD	mS/cm	0.827	1.05	0.507	0.774	0.569	0.663	0.721	--	0.585	0.227	0.364	--	0.497	0.399	1.86	1.86	1.62	2.21	1.7
TEMPERATURE, FIELD MEASURED	deg c	15..39	19.36	19.74	19.96	20.15	19.78	17.66	--	18.49	17.13	19.98	--	21.29	23.85	19.42	20.73	20.83	21.28	18.16
TURBIDITY	NTU	0	10.5	126	18.8	0	21	38.8	--	2.8	0	0	--	0.1	18	0	28.7	0.5	4.6	0

Notes:

µg/L	micrograms per liter
mg/L	milligrams per liter
mV	millivolts
S.U.	standard unit
mS/cm	milliSiemens per centimeter
deg c	degrees Celsius
NTU	nephelometric turbidity units
--	paramater not collected / unavailable

Table 3-3
Groundwater Stabilized Purge Parameters, 2019 to Present
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Sample Location		S-435		S-436			S-437					S-438		S-439		S-479		S-480		S-481	
Sample Date		9/9/2020	7/19/2023	9/10/2020	7/20/2023	9/5/2024	10/8/2024	11/7/2024	12/18/2024	2/3/2025	7/29/2023	9/9/2024	7/20/2023	9/9/2024	7/25/2023	9/9/2024	7/21/2023	9/6/2024	7/21/2023	9/9/2024
Sample ID		S-435_20200909	S-435_20230719	S-436_20200910	20230720_S-437	S-437_20240905	S-437_20241008	S-437_20241107	S-437_20241218	S-437_20250203	S-438_20230720	S-438_20240909	S-439_20230720	S-439_20240909	S-479_20230725	S-479_20240909	S-480_SL_20230721	S-480_20240906	S-481_20230721	S-481_20240909
Hydrostratigraphic Unit	Units	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer
Field Parameters																				
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	0.27	0	0.77	0	0	0.43	0.2	0.04	7.21	0.57	0	0.56	2.47	0	0	0	0	1.73	6.52
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	32	12	-78	119	-113	-116	-109	-87	-107	-185	-119	-169	-129	-94	-92	-159	-118	-64	-104
pH, FIELD MEASURED	S.U.	7.28	5.88	7.66	5.48	6.2	6.43	6.16	5.83	6.32	7.19	6.92	6.78	6.57	6.08	6.84	6.33	6.48	7.05	6.64
SPECIFIC CONDUCTANCE FIELD	mS/cm	2.09	2.87	1.36	0.209	0.184	0.246	0.297	0.462	0.624	0.597	1.18	0.727	0.687	0.515	0.432	1.12	1.16	0.142	0.463
TEMPERATURE, FIELD MEASURED	deg c	20.86	18.41	19.74	19.77	22.2	21.36	22.35	20.39	16.78	21.46	21.13	23.08	24.63	26.77	25.25	24.99	21.61	24.78	21.78
TURBIDITY	NTU	17.1	1.8	0	152	8.9	12.3	53	48.6	74.3	16	52.1	210	121	31.6	54.1	42.7	105	258	126

Notes:

µg/L	micrograms per liter
mg/L	milligrams per liter
mV	millivolts
S.U.	standard unit
mS/cm	milliSiemens per centimeter
deg c	degrees Celsius
NTU	nephelometric turbidity units
--	paramater not collected / unavailable

Table 3-3
Groundwater Stabilized Purge Parameters, 2019 to Present
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Sample Location		S-482			S-483	S-484						S-485		S-507	S-508		S-509		S-69D	
Sample Date		7/20/2023	9/9/2024	10/8/2024	7/25/2023	7/19/2023	9/5/2024	10/8/2024	11/7/2024	12/18/2024	2/3/2025	7/20/2023	6/3/2024	7/17/2023	7/20/2023	9/5/2024	7/20/2023	5/31/2024	2/26/2019	9/1/2020
Sample ID		S-428_20230720	S-482_20240909	S-482_20241008	S-483_20230725	S-484_20230719	S-484_20240905	S-484_20241008	S-484_20241107	S-484_20241218	S-484_20250203	S-485_20230720	S-485_20240603	S-507_20230717	S-508_20230720	S-508_20240905	S-509_20230720	S-509_20240531	S-69D_20190226	S-69D_20200901
Hydrostratigraphic Unit	Units	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	unconfined aquifer	lower aquifer	lower aquifer	lower aquifer	lower aquifer	lower aquifer	lower aquifer
Field Parameters																				
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	14.01	0	0.34	0	0	0.3	0.46	0.01	0.1	0.53	2.7	0	0	0	0	0	0	0	0
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	122	-104	-167	-140	-136	-137	-130	-160	-110	-158	21	-116	-24	-29	-48	-58	-144	13	--
pH, FIELD MEASURED	S.U.	5.89	6.75	6.88	6.72	6.77	6.71	6.83	6.73	6.24	6.86	7	6.69	6.22	5.96	6.22	6.95	7.03	6.88	6.26
SPECIFIC CONDUCTANCE FIELD	mS/cm	0	0.519	0.513	1	1.09	1.07	1.12	0.814	0.603	0.793	0.123	0.188	1.09	1.33	1.08	1.02	0.735	0.956	0.914
TEMPERATURE, FIELD MEASURED	deg c	35.14	21.63	20.28	26.69	19.67	20.97	19098	21.59	20.41	19.63	22.57	20.18	19.16	18.17	17.82	18.69	14.64	14.23	19.73
TURBIDITY	NTU	405	118	4.6	40	9	54.1	7.9	103	45.9	71.8	51.8	0	71.9	7.9	12.01	28.8	142	1000	0

Notes:

µg/L	micrograms per liter
mg/L	milligrams per liter
mV	millivolts
S.U.	standard unit
mS/cm	milliSiemens per centimeter
deg c	degrees Celsius
NTU	nephelometric turbidity units
--	paramater not collected / unavailable

Table 3-4
Groundwater General Chemistry Parameters Summary, 2015 - Present
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Location	BF-103R	C-129D	S-280D	S-283	S-284D	S-382	S-411	S-411	S-411	S-411	S-414
Field Sample ID	BF-103R_20230720	C-129D_20210513	S-280D_20210427	S-283_SL_20230721	S-284D_20210423	S-382_SL_20230721	S-411_20210427	S-411_20220324	S-411_20230428	S-411_20240426	S-414_20230718
Sample Date	7/20/2023	5/13/2021	4/27/2021	7/21/2023	4/23/2021	7/21/2023	4/27/2021	3/24/2022	4/28/2023	4/26/2024	7/18/2023
Comments											
Hydrostratigraphic Unit	Unconfined Aquifer	Lower Aquifer	Lower Aquifer	Unconfined Aquifer	Lower Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer
General Chemistry											
Bicarbonate Alkalinity	161000 (2000)	NA	NA	168000 (2000)	NA	161000 (2000)	NA	NA	NA	NA	260000 (2000)
Carbon Dioxide	62600 (6000)	NA	NA	61000 (6000)	NA	43600 (6000)	NA	NA	6740 (250)	11800 (250)	91000 (3000)
Chloride	56100 (5000)	NA	NA	12800 (500)	NA	79700 (5000)	NA	NA	NA	NA	98200 (5000)
Sulfate	61900 (1000)	41000 (5000)	52000 (5000)	10800 (1000)	28000 (5000)	9340 (1000)	2800 J (5000)	18400 (2000)	35700 (2000)	11900 (2000)	26200 (1000)
Ethane	ND (0.5)	2.5 J (5)	ND (5)	ND (0.5)	ND (5)	0.506 (0.5)	ND (5)	ND (0.23)	ND (0.23)	ND (0.23)	1.48 (0.5)
Ethene	ND (0.5)	ND (5)	ND (5)	ND (0.5)	ND (5)	ND (0.5)	ND (5)	ND (0.31)	ND (0.31)	ND (0.31)	0.878 (0.5)
Methane	133 (2)	1100 (25)	620 (25)	9160 (2)	60 (5)	386 (2)	2800 (100)	65.5 (0.11)	1.32 (0.11)	24.2 (0.11)	3440 (2)
Calcium	36200 (100)	60000 (500)	28000 (500)	36400 (100)	80000 (500)	40200 (100)	55000 (500)	47100 (5000)	40500 (5000)	56900 (5000)	66100 (100)
Iron	8690 (50)	16000 (200)	13000 (200)	21500 (50)	1800 (200)	26900 (50)	20000 (200)	1420 (100)	50500 (100)	ND (100)	21500 (50)
Magnesium	9750 (100)	NA	NA	11400 (100)	NA	9010 (100)	NA	NA	NA	NA	24600 (100)
Nitrate	ND (50)	NA	NA	ND (50)	NA	ND (50)	NA	NA	NA	NA	148 (50)
Potassium	4240 (2500)	NA	NA	6190 (2500)	NA	1850 J (2500)	NA	NA	NA	NA	7020 (2500)
Sodium	73200 (2000)	NA	NA	22600 (2000)	NA	61900 (2000)	NA	NA	NA	NA	69900 (2000)

Notes:

1 All concentrations reported in ug/L (ppb);
detection limits in parentheses.

Abbreviations:

ND - Not Detected
NA - Not Analyzed

Table 3-4
Groundwater General Chemistry Parameters Summary, 2015 - Present
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Location	S-428	S-429	S-430	S-431	S-433	S-435	S-437	S-438	S-439	S-479	S-480
Field Sample ID	S-428_20230718	S-429_20230718	S-430_20230718	S-431_20230718	S-433_20230718	S-435_20230719	S-437_20230720	S-438_20230720	S-439_20230720	S-479_20230725	S-480_SL_20230724
Sample Date	7/18/2023	7/18/2023	7/18/2023	7/18/2023	7/18/2023	7/19/2023	7/20/2023	7/20/2023	7/20/2023	7/25/2023	7/21/2023
Comments											
Hydrostratigraphic Unit	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer
General Chemistry											
Bicarbonate Alkalinity	77400 (2000)	233000 (2000)	176000 (2000)	58600 (2000)	466000 (2000)	105000 (2000)	34400 (2000)	159000 (2000)	276000 (2000)	182000 (2000)	178000 (2000)
Carbon Dioxide	76300 (3000)	47000 (3000)	90500 (3000)	65200 (3000)	94500 (3000)	109000 (6000)	45900 (6000)	30300 (6000)	131000 (6000)	53000 (3000)	59800 (6000)
Chloride	34600 (500)	162000 (5000)	42700 (500)	29900 (500)	265000 (5000)	820000 (50000)	18700 (500)	112000 (5000)	60800 (5000)	65800 (5000)	204000 (5000)
Sulfate	3210 (1000)	3190 (1000)	1880 (1000)	114000 (10000)	24400 (1000)	58200 (1000)	32900 (1000)	5510 (1000)	ND (1000)	6260 (1000)	511 J (1000)
Ethane	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Ethene	0.716 (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Methane	4060 (2)	7130 (2)	4560 (2)	330 (2)	2290 (2)	ND (2)	955 (2)	6330 (2)	12700 (2)	7420 (2)	6290 (2)
Calcium	28500 (100)	90600 (100)	45200 (100)	50500 (100)	135000 (100)	198000 (100)	11000 (100)	57600 (100)	74400 (100)	61700 (100)	23400 (100)
Iron	9280 (50)	21800 (50)	17600 (50)	9180 (50)	4020 (50)	939 (50)	9980 (50)	14200 (50)	57900 (50)	3840 (50)	49200 (50)
Magnesium	4660 (100)	14100 (100)	14200 (100)	8570 (100)	15600 (100)	90300 (100)	3350 (100)	7300 (100)	27700 (100)	9070 (100)	43100 (100)
Nitrate	ND (50)	ND (50)	70.8 (50)	2350 (50)	22.8 J (50)	ND (50)	1900 (50)	ND (50)	34.2 J (50)	ND (50)	58.6 (50)
Potassium	3440 (2500)	6620 (2500)	3980 (2500)	3710 (2500)	10200 (2500)	12100 (2500)	3220 (2500)	4020 (2500)	14400 (2500)	4160 (2500)	35700 (2500)
Sodium	20500 (2000)	78600 (2000)	35100 (2000)	22300 (2000)	201000 (2000)	274000 (2000)	22900 (2000)	66300 (2000)	29900 (2000)	29800 (2000)	93600 (2000)

Notes:

1 All concentrations reported in ug/L (ppb);
detection limits in parentheses.

Abbreviations:

ND - Not Detected
NA - Not Analyzed

Table 3-4
Groundwater General Chemistry Parameters Summary, 2015 - Present
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Location	S-481	S-482	S-483	S-484	S-485	S-507	S-508	S-509	S-69D
Field Sample ID	S-481_20230721	S-482_20230720	S-483_20230725	S-484_20230719	S-485_20230720	S-507_20230717	S-508_20230720	S-509_20230720	S-69D_20210426
Sample Date	7/21/2023	7/20/2023	7/25/2023	7/19/2023	7/20/2023	7/17/2023	7/20/2023	7/20/2023	4/26/2021
Comments									
Hydrostratigraphic Unit	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer
General Chemistry									
Bicarbonate Alkalinity	48000 (2000)	230000 (2000)	301000 (2000)	224000 (2000)	49600 (2000)	306000 (2000)	336000 (2000)	312000 (2000)	NA
Carbon Dioxide	13900 (6000)	106000 (6000)	44400 (3000)	45200 (6000)	29400 (6000)	124000 (3000)	122000 (6000)	115000 (6000)	NA
Chloride	23100 (500)	243000 (5000)	69100 (5000)	215000 (5000)	1470 (500)	123000 (5000)	103000 (5000)	66400 (5000)	NA
Sulfate	13000 (1000)	39000 (1000)	9950 (1000)	14600 (1000)	21300 (1000)	77000 (1000)	191000 (10000)	121000 (10000)	92000 (20000)
Ethane	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	1.32 (0.5)	1.5 (0.5)	ND (5)
Ethene	ND (0.5)	0.609 (0.5)	0.622 (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	0.847 (0.5)	ND (5)
Methane	2.71 (2)	301 (2)	302 (2)	4470 (2)	2.84 (2)	33.9 (2)	22.5 (2)	25.8 (2)	47 (5)
Calcium	17700 (100)	59200 (100)	48900 (100)	132000 (100)	15200 (100)	62700 (100)	72800 (100)	47800 (100)	63000 (500)
Iron	2380 (50)	7020 (50)	10700 (50)	20900 (50)	353 (50)	750 (50)	10100 (50)	6430 (50)	1800 (200)
Magnesium	3040 (100)	20100 (100)	16700 (100)	19000 (100)	768 (100)	46200 (100)	47800 (100)	53800 (100)	NA
Nitrate	ND (50)	ND (50)	51.8 (50)	ND (50)	174 (50)	ND (50)	ND (50)	ND (50)	NA
Potassium	2270 J (2500)	25900 (2500)	4180 (2500)	8520 (2500)	5100 (2500)	10200 (2500)	9990 (2500)	5780 (2500)	NA
Sodium	19600 (2000)	195000 (2000)	141000 (2000)	57100 (2000)	9630 (2000)	85900 (2000)	67700 (2000)	57200 (2000)	NA

Notes:

1 All concentrations reported in ug/L (ppb); detection limits in parentheses.

Abbreviations:

ND - Not Detected
NA - Not Analyzed

Table 3-5
Groundwater Analytical Results Summary, 2015 to Present
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Location	Non-Res GW	BF-103R	BF-103R	BF-103R	BF-103R	BF-103R	BF-106	BF-106	BF-106
Field Sample ID	Used Aquifer	AOI3_BF-103R_060915	AOI3_BF-103R_123115	BF-103R_20190226	BF-103R_20230720	BF-103R_20240603	AOI3_BF-106_060515	AOI3_BF-106_061615	AOI3_BF-106_121115
Sample Date	(TDS ≤ 2500)	6/9/2015	12/31/2015	2/26/2019	7/20/2023	6/3/2024	6/5/2015	6/16/2015	12/11/2015
Hydrostratigraphic Unit	MSC	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer
Volatile Organic Compounds									
Benzene	5	3.6 (1)	ND (0.5)	ND (1)	**8000 (25)**	**2700 (10)**	**162 (1)**	NA	**195 (0.5)**
Cumene	3500	ND (1)	ND (1)	ND (5)	ND (25)	ND (10)	54.8 (1)	NA	36.4 (1)
1,2-Dibromoethane	0.05	**0.086 (0.04)**	ND (0.019)	ND (1)	ND (100)	ND (40)	0.04 J (0.04)	NA	ND (0.022)
1,2-Dichloroethane	5	ND (1)	ND (1)	ND (5)	ND (25)	ND (10)	ND (1)	NA	ND (1)
Ethyl Benzene	700	0.59 J (1)	ND (1)	ND (1)	11 J (25)	5.6 J (10)	14.7 (1)	NA	23.8 (1)
Methyl tert-butyl ether	20	ND (1)	ND (1)	ND (1)	ND (50)	ND (20)	ND (1)	NA	ND (1)
Toluene	1000	6.1 (1)	ND (1)	ND (1)	**2600 (38)**	890 (15)	1.7 (1)	NA	1.4 (1)
1,2,4-Trimethylbenzene	530	0.91 J (1)	ND (2)	NA	NA	NA	31.2 (1)	NA	44.1 (2)
1,3,5-Trimethylbenzene	530	0.25 J (1)	ND (2)	NA	NA	NA	9.6 (1)	NA	19.1 (2)
Xylenes (total)	10000	3.6 (3)	ND (1)	ND (5)	60 J (50)	23 J (20)	5.5 (3)	NA	10.4 (1)
Semivolatile Organic Compounds									
Anthracene	66	ND (1)	ND (0.11)	NA	NA	NA	NA	ND (2)	ND (0.11)
Benzo(a)anthracene	3.9	ND (1)	ND (0.056)	NA	NA	NA	NA	ND (2)	ND (0.056)
Benzo(a)pyrene	0.2	ND (1)	ND (0.056)	NA	NA	NA	NA	**0.72 J (2)**	ND (0.056)
Benzo(b)fluoranthene	1.2	ND (1)	ND (0.11)	NA	NA	NA	NA	**1.4 J (2)**	ND (0.11)
Benzo(g,h,i)perylene	0.26	ND (1)	ND (0.11)	NA	NA	NA	NA	ND (2)	ND (0.11)
Chrysene	1.9	ND (1)	ND (0.11)	NA	NA	NA	NA	ND (2)	ND (0.11)
Fluorene	1900	ND (1)	ND (0.11)	NA	NA	NA	NA	7 (2)	3.31 (0.11)
Naphthalene	100	0.23 J (1)	ND (0.11)	NA	NA	NA	NA	4.1 (2)	ND (0.11)
Phenanthrene	1100	ND (1)	0.155 (0.11)	NA	NA	NA	NA	2.5 (2)	ND (0.11)
Pyrene	130	ND (1)	ND (0.11)	NA	NA	NA	NA	0.89 J (2)	ND (0.11)
Metals (Dissolved)									
Lead	5	ND (5)	ND (3)	NA	NA	NA	ND (5)	NA	ND (3)

Notes:
1 All concentrations reported in ug/L (ppb); detection limits in parentheses.
2 XQ is an unknown qualifier.
3 Boldfaced concentrations exceed the Non-Res GW Used Aquifer (TDS ≤ 2500) MSC.

Abbreviations:
ND - Not Detected
NA - Not Analyzed
J - Estimated Concentration
B - Analyte found in associated blank.
^c - CCV Recovery is outside acceptance limits.
SL - sample collected from below light non-aqeuous phase liquid (LNAPL)

Table 3-5
Groundwater Analytical Results Summary, 2015 to Present
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Location	Non-Res GW	BF-106	BF-106	BF-106	BF-99	BF-99	BF-99	BF-99	BF-99
Field Sample ID	Used Aquifer	BF-106_20190227	BF-106_20200910	BF-106_20230719	AOI3_BF-99_060515	AOI3_BF-99_061615	AOI3_BF-99_121115	BF-99_20190227	BF-99_20200910
Sample Date	(TDS ≤ 2500)	2/27/2019	9/10/2020	7/19/2023	6/5/2015	6/16/2015	12/11/2015	2/27/2019	9/10/2020
Hydrostratigraphic Unit	MSC	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer
Volatile Organic Compounds									
Benzene	5	**91 (1)**	**20 (10)**	**21 (2)**	0.38 J (1)	NA	0.26 J (0.5)	**100 (1)**	ND (1)
Cumene	3500	39 (5)	33 J (50)	53 (2)	10.1 (1)	NA	13.3 (1)	7 (5)	11 (5)
1,2-Dibromoethane	0.05	ND (1)	ND (10)	ND (8)	ND (0.04)	NA	ND (0.042)	ND (1)	ND (1)
1,2-Dichloroethane	5	ND (5)	ND (10)	ND (2)	ND (1)	NA	ND (1)	ND (5)	ND (1)
Ethyl Benzene	700	5 (1)	5.1 J (10)	1.5 J (2)	2.9 (1)	NA	ND (1)	0.2 J (1)	ND (1)
Methyl tert-butyl ether	20	ND (1)	ND (10)	ND (4)	ND (1)	NA	ND (1)	ND (1)	ND (1)
Toluene	1000	22 (1)	2.3 J (10)	1.5 J (3)	6.7 (1)	NA	0.78 J (1)	46 (1)	0.57 J (1)
1,2,4-Trimethylbenzene	530	NA	NA	NA	4.1 (1)	NA	0.87 J (2)	NA	NA
1,3,5-Trimethylbenzene	530	NA	NA	NA	3 (1)	NA	0.7 J (2)	NA	NA
Xylenes (total)	10000	3 J (5)	ND (60)	ND (4)	17.2 (3)	NA	0.22 J (1)	ND (5)	ND (6)
Semivolatile Organic Compounds									
Anthracene	66	NA	NA	NA	NA	0.091 J (0.1)	ND (0.1)	NA	NA
Benzo(a)anthracene	3.9	NA	NA	NA	NA	ND (0.1)	ND (0.05)	NA	NA
Benzo(a)pyrene	0.2	NA	NA	NA	NA	0.011 J (0.1)	ND (0.05)	NA	NA
Benzo(b)fluoranthene	1.2	NA	NA	NA	NA	0.028 J (0.1)	ND (0.1)	NA	NA
Benzo(g,h,i)perylene	0.26	NA	NA	NA	NA	ND (0.1)	ND (0.1)	NA	NA
Chrysene	1.9	NA	NA	NA	NA	ND (0.1)	ND (0.1)	NA	NA
Fluorene	1900	NA	NA	NA	NA	2.2 (0.1)	2.77 (0.1)	NA	NA
Naphthalene	100	NA	NA	NA	NA	0.78 (0.1)	ND (0.1)	NA	NA
Phenanthrene	1100	NA	NA	NA	NA	1.2 (0.1)	2.4 (0.1)	NA	NA
Pyrene	130	NA	NA	NA	NA	0.33 (0.1)	0.939 (0.1)	NA	NA
Metals (Dissolved)									
Lead	5	NA	NA	NA	ND (5)	NA	ND (3)	NA	NA

Notes:
1 All concentrations reported in ug/L (ppb); detection limits in parentheses.
2 XQ is an unknown qualifier.
3 Boldfaced concentrations exceed the Non-Res GW Used Aquifer (TDS ≤ 2500) MSC.

Abbreviations:
ND - Not Detected
NA - Not Analyzed
J - Estimated Concentration
B - Analyte found in associated blank.
^c - CCV Recovery is outside acceptance limits.
SL - sample collected from below light non-aqeuous phase liquic

Table 3-5
Groundwater Analytical Results Summary, 2015 to Present
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Location	Non-Res GW	BF-99	C-129D	C-129D	C-129D	C-129D	C-129D	C-129D	C-129D
Field Sample ID	Used Aquifer	BF-99_20230719	GW-11109614-C-129D-072116-AC-004	GW-11109614-C129D-081916-AC-01	C-129D_20190226	C-129D_20190711	C-129D_20191030	C-129D_20200902	C-129D_20210513
Sample Date	(TDS ≤ 2500)	7/19/2023	7/21/2016	8/19/2016	2/26/2019	7/11/2019	10/30/2019	9/2/2020	5/13/2021
Hydrostratigraphic Unit	MSC	Unconfined Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer
Volatile Organic Compounds									
Benzene	5	**17 (0.5)**	ND (1)	0.6 J (1)	0.2 J (1)	ND (1)	ND (1)	ND (1)	ND (1)
Cumene	3500	9.4 (0.5)	ND (2)	ND (2)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
1,2-Dibromoethane	0.05	ND (2)	ND (0.029)	ND (0.028)	ND (1)	ND (0.028)	ND (0.028)	ND (1)	ND (0.028)
1,2-Dichloroethane	5	ND (0.5)	ND (1)	ND (1)	ND (5)	ND (5)	ND (5)	ND (1)	ND (1)
Ethyl Benzene	700	ND (0.5)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Methyl tert-butyl ether	20	ND (1)	1 (1)	0.6 J (1)	0.3 J (1)	0.5 J (1)	ND (1)	ND (1)	0.74 J (1)
Toluene	1000	1.1 (0.75)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,2,4-Trimethylbenzene	530	NA	ND (2)	ND (2)	NA	ND (5)	ND (5)	NA	ND (5)
1,3,5-Trimethylbenzene	530	NA	ND (2)	ND (2)	NA	ND (5)	ND (5)	NA	ND (5)
Xylenes (total)	10000	ND (1)	ND (1)	ND (1)	ND (5)	ND (5)	ND (3)	ND (6)	ND (6)
Semivolatile Organic Compounds									
Anthracene	66	NA	0.016 J (0.051)	0.041 J (0.05)	NA	ND (0.5)	ND (0.5)	NA	ND (0.56)
Benzo(a)anthracene	3.9	NA	ND (0.051)	ND (0.05)	NA	ND (0.5)	ND (0.5)	NA	ND (0.56)
Benzo(a)pyrene	0.2	NA	ND (0.051)	ND (0.05)	NA	ND (0.5)	ND (0.5)	NA	ND (0.56)
Benzo(b)fluoranthene	1.2	NA	ND (0.051)	ND (0.05)	NA	ND (0.5)	ND (0.5)	NA	ND (0.56)
Benzo(g,h,i)perylene	0.26	NA	ND (0.051)	ND (0.05)	NA	ND (0.5)	ND (0.5)	NA	ND (0.56)
Chrysene	1.9	NA	ND (0.051)	ND (0.05)	NA	ND (0.5)	ND (0.5)	NA	ND (0.56)
Fluorene	1900	NA	0.035 J (0.051)	0.11 (0.05)	NA	0.1 J (0.5)	ND (0.5)	NA	ND (0.56)
Naphthalene	100	NA	ND (0.061)	0.095 (0.06)	NA	ND (0.5)	ND (0.5)	NA	ND (0.56)
Phenanthrene	1100	NA	ND (0.061)	0.13 (0.06)	NA	0.2 J (0.5)	ND (0.5)	NA	ND (0.56)
Pyrene	130	NA	0.14 (0.051)	0.071 (0.05)	NA	0.2 J (0.5)	0.2 J (0.5)	NA	0.13 J (0.56)
Metals (Dissolved)									
Lead	5	NA	ND (1)	ND (1)	NA	ND (3)	ND (0.5)	NA	ND (0.52)

Notes:
1 All concentrations reported in ug/L (ppb); detection limits in parentheses.
2 XQ is an unknown qualifier.
3 Boldfaced concentrations exceed the Non-Res GW Used Aquifer (TDS ≤ 2500) MSC.

Abbreviations:
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NA - Not Analyzed
J - Estimated Concentration
B - Analyte found in associated blank.
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Groundwater Analytical Results Summary, 2015 to Present
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Bellwether District Holdings, LLC , Philadelphia, PA

Location	Non-Res GW	C-129D	C-174	C-174	C-174	C-174	S-280	S-280	S-280
Field Sample ID	Used Aquifer	C-129D_20220413	GW-11109614-C-50D-072016-AC-003	C-174_20190226	C-174_20200909	C-174_20230717	AOI3_S-280_060815	AOI3_S-280_121615	S-280-20160520
Sample Date	(TDS ≤ 2500)	4/13/2022	7/20/2016	2/26/2019	9/9/2020	7/17/2023	6/8/2015	12/16/2015	5/20/2016
Hydrostratigraphic Unit	MSC	Lower Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer
Volatile Organic Compounds									
Benzene	5	ND (0.5)	ND (1)	ND (1)	ND (1)	ND (0.5)	**6570 (50)**	**28500 (250)**	**16000 (500)**
Cumene	3500	ND (1)	ND (2)	ND (5)	ND (5)	ND (0.5)	ND (50)	ND (100)	ND (100)
1,2-Dibromoethane	0.05	0.047 (0.02)	ND (0.029)	ND (1)	ND (1)	ND (2)	ND (0.04)	ND (0.019)	ND (0.029)
1,2-Dichloroethane	5	ND (1)	ND (1)	ND (5)	ND (1)	ND (0.5)	ND (50)	ND (100)	ND (50)
Ethyl Benzene	700	ND (1)	ND (1)	ND (1)	ND (1)	ND (0.5)	ND (50)	ND (100)	ND (50)
Methyl tert-butyl ether	20	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (50)	ND (100)	ND (50)
Toluene	1000	ND (1)	ND (1)	ND (1)	ND (1)	ND (0.75)	ND (50)	35.1 J (100)	26 J (50)
1,2,4-Trimethylbenzene	530	ND (2)	ND (2)	NA	NA	NA	ND (50)	ND (200)	ND (100)
1,3,5-Trimethylbenzene	530	ND (2)	ND (2)	NA	NA	NA	ND (50)	ND (200)	ND (100)
Xylenes (total)	10000	ND (1)	ND (1)	ND (5)	ND (6)	ND (1)	ND (150)	ND (100)	ND (50)
Semivolatile Organic Compounds									
Anthracene	66	ND (0.071)	0.17 (0.05)	NA	NA	NA	0.038 J (0.24)	ND (0.1)	ND (0.5)
Benzo(a)anthracene	3.9	ND (0.036)	0.16 (0.05)	NA	NA	NA	0.058 J (0.24)	ND (0.05)	ND (0.5)
Benzo(a)pyrene	0.2	ND (0.036)	**0.24 (0.05)**	NA	NA	NA	ND (0.24)	ND (0.05)	ND (0.5)
Benzo(b)fluoranthene	1.2	ND (0.036)	0.23 (0.05)	NA	NA	NA	ND (0.24)	ND (0.1)	ND (0.5)
Benzo(g,h,i)perylene	0.26	ND (0.071)	0.15 (0.05)	NA	NA	NA	**0.35 (0.24)**	ND (0.1)	ND (0.5)
Chrysene	1.9	ND (0.071)	0.15 (0.05)	NA	NA	NA	0.048 J (0.24)	ND (0.1)	ND (0.5)
Fluorene	1900	0.0577 J (0.071)	0.71 (0.05)	NA	NA	NA	ND (0.24)	ND (0.1)	ND (0.5)
Naphthalene	100	ND (0.071)	ND (0.06)	NA	NA	NA	0.15 J (0.24)	ND (0.1)	ND (0.5)
Phenanthrene	1100	0.0689 J (0.071)	0.2 (0.06)	NA	NA	NA	0.37 (0.24)	0.176 (0.1)	ND (0.5)
Pyrene	130	0.111 (0.071)	0.43 (0.05)	NA	NA	NA	0.21 J (0.24)	ND (0.1)	ND (0.5)
Metals (Dissolved)									
Lead	5	ND (1)	ND (1)	NA	NA	NA	ND (5)	ND (3)	ND (1)

Notes:
1 All concentrations reported in ug/L (ppb); detection limits in parentheses.
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Abbreviations:
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Bellwether District Holdings, LLC , Philadelphia, PA

Location	Non-Res GW	S-280	S-280	S-280	S-280	S-280	S-280	S-280	S-280
Field Sample ID	Used Aquifer	S-280-20170522	S-280_20180625	S-280DUP_20180625	S-280_20190227	S-280_20190626	S-280_20200902	S-280_20230428	S-280_20230717
Sample Date	(TDS ≤ 2500)	5/22/2017	6/25/2018	6/25/2018	2/27/2019	6/26/2019	9/2/2020	4/28/2023	7/17/2023
Hydrostratigraphic Unit	MSC	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer
Volatile Organic Compounds									
Benzene	5	**27000 (200)**	**37200 (500)**	**39900 (500)**	**41000 (200)**	**52000 (1000)**	**35000 (500)**	**90.4 (0.5)**	**97 (0.5)**
Cumene	3500	ND (2)	ND (50)	ND (50)	ND (250)	ND (500)	ND (250)	ND (1)	ND (0.5)
1,2-Dibromoethane	0.05	ND (0.029)	ND (0.0102)	ND (0.01)	ND (50)	ND (0.028)	ND (50)	ND (0.021)	ND (2)
1,2-Dichloroethane	5	ND (1)	ND (50)	ND (50)	ND (250)	ND (500)	ND (50)	ND (1)	ND (0.5)
Ethyl Benzene	700	5 (1)	ND (50)	ND (50)	ND (50)	ND (100)	ND (50)	ND (1)	ND (0.5)
Methyl tert-butyl ether	20	ND (1)	ND (50)	ND (50)	ND (50)	ND (100)	ND (50)	ND (1)	ND (1)
Toluene	1000	290 (20)	ND (50)	ND (50)	110 (50)	68 J (100)	410 (50)	ND (1)	2.6 (0.75)
1,2,4-Trimethylbenzene	530	ND (2)	ND (50)	ND (50)	NA	ND (500)	NA	ND (2)	NA
1,3,5-Trimethylbenzene	530	ND (2)	ND (50)	ND (50)	NA	ND (500)	NA	ND (2)	NA
Xylenes (total)	10000	19 (1)	ND (150)	ND (150)	ND (250)	ND (500)	ND (300)	ND (1)	ND (1)
Semivolatile Organic Compounds									
Anthracene	66	ND (0.5)	ND (0.0515)	ND (0.05)	NA	ND (0.5)	NA	0.0555 J (0.08)	NA
Benzo(a)anthracene	3.9	ND (0.5)	ND (0.0515)	ND (0.05)	NA	ND (0.5)	NA	0.101 (0.04)	NA
Benzo(a)pyrene	0.2	ND (0.5)	ND (0.0515)	ND (0.05)	NA	ND (0.5)	NA	0.0644 (0.04)	NA
Benzo(b)fluoranthene	1.2	ND (0.5)	ND (0.0515)	ND (0.05)	NA	ND (0.5)	NA	0.189 (0.04)	NA
Benzo(g,h,i)perylene	0.26	ND (0.5)	ND (0.0515)	0.0563 (0.05)	NA	ND (0.5)	NA	0.135 (0.08)	NA
Chrysene	1.9	ND (0.5)	ND (0.0515)	ND (0.05)	NA	ND (0.5)	NA	0.164 (0.08)	NA
Fluorene	1900	ND (0.5)	ND (0.0515)	ND (0.05)	NA	0.1 J (0.5)	NA	ND (0.08)	NA
Naphthalene	100	ND (0.5)	ND (0.258)	ND (0.25)	NA	2 (0.5)	NA	ND (0.08)	NA
Phenanthrene	1100	ND (0.5)	ND (0.0515)	0.106 (0.05)	NA	0.3 J (0.5)	NA	0.212 (0.08)	NA
Pyrene	130	ND (0.5)	ND (0.0515)	ND (0.05)	NA	ND (0.5)	NA	0.213 (0.08)	NA
Metals (Dissolved)									
Lead	5	ND (1)	ND (2)	ND (2)	NA	ND (3)	NA	ND (1)	NA

Notes:
1 All concentrations reported in ug/L (ppb); detection limits in parentheses.
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Abbreviations:
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UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Location	Non-Res GW	S-280D	S-280D	S-280D	S-280D	S-280D	S-280D	S-280D	S-280D
Field Sample ID	Used Aquifer	AOI3_S-280D_060815	AOI3_S-280D_121515	S-280D_20190226	S-280D_20190620	S-280D_20191029	S-280D_20200901	S-280D_20210427	S-280D_20220404
Sample Date	(TDS ≤ 2500)	6/8/2015	12/15/2015	2/26/2019	6/20/2019	10/29/2019	9/1/2020	4/27/2021	4/4/2022
Hydrostratigraphic Unit	MSC	Lower Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer
Volatile Organic Compounds									
Benzene	5	ND (1)	ND (0.5)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (0.5)
Cumene	3500	ND (1)	ND (1)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (1)
1,2-Dibromoethane	0.05	ND (0.04)	ND (0.019)	ND (1)	ND (0.028)	ND,XQ (0.028)	ND (1)	ND (0.029)	ND (0.02)
1,2-Dichloroethane	5	ND (1)	ND (1)	ND (5)	ND (5)	ND (5)	ND (1)	ND (1)	ND (1)
Ethyl Benzene	700	0.81 J (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Methyl tert-butyl ether	20	ND (1)	0.67 J (1)	0.4 J (1)	ND (1)	ND (1)	0.23 J (1)	0.38 J (1)	ND (1)
Toluene	1000	1.5 (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,2,4-Trimethylbenzene	530	1.7 (1)	ND (2)	NA	ND (5)	ND (5)	NA	ND (5)	ND (2)
1,3,5-Trimethylbenzene	530	ND (1)	ND (2)	NA	ND (5)	ND (5)	NA	ND (5)	ND (2)
Xylenes (total)	10000	5.1 (3)	ND (1)	ND (5)	ND (5)	ND (3)	ND (6)	ND (6)	ND (1)
Semivolatile Organic Compounds									
Anthracene	66	ND (0.1)	ND (0.1)	NA	ND (0.5)	ND (0.6)	NA	ND (0.51)	ND (0.08)
Benzo(a)anthracene	3.9	ND (0.1)	ND (0.05)	NA	ND (0.5)	ND (0.6)	NA	ND (0.51)	ND (0.04)
Benzo(a)pyrene	0.2	ND (0.1)	ND (0.05)	NA	ND (0.5)	ND (0.6)	NA	ND (0.51)	ND (0.04)
Benzo(b)fluoranthene	1.2	ND (0.1)	ND (0.1)	NA	ND (0.5)	ND (0.6)	NA	ND (0.51)	ND (0.04)
Benzo(g,h,i)perylene	0.26	ND (0.1)	ND (0.1)	NA	ND (0.5)	ND (0.6)	NA	ND (0.51)	ND (0.08)
Chrysene	1.9	ND (0.1)	ND (0.1)	NA	ND (0.5)	ND (0.6)	NA	ND (0.51)	ND (0.08)
Fluorene	1900	ND (0.1)	ND (0.1)	NA	ND (0.5)	ND (0.6)	NA	ND (0.51)	ND (0.08)
Naphthalene	100	0.17 (0.1)	ND (0.1)	NA	ND (0.5)	ND (0.6)	NA	ND (0.51)	ND (0.08)
Phenanthrene	1100	ND (0.1)	ND (0.1)	NA	ND (0.5)	ND (0.6)	NA	ND (0.51)	ND (0.08)
Pyrene	130	ND (0.1)	ND (0.1)	NA	ND (0.5)	ND (0.6)	NA	ND (0.51)	ND (0.08)
Metals (Dissolved)									
Lead	5	ND (5)	ND (3)	NA	ND (3)	0.18 J (0.5)	NA	ND (0.52)	ND (1)

Notes:
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Bellwether District Holdings, LLC , Philadelphia, PA

Location	Non-Res GW	S-280D	S-280D	S-283	S-283	S-283	S-283	S-283	S-284
Field Sample ID	Used Aquifer	S-280D_20230427	S-280D_20230717	AOI3_S-283_060815	AOI3_S-283_122115	S-283_20190226	S-283_SL_20230721	S-283_20240531	AOI3_S-284_060815
Sample Date	(TDS ≤ 2500)	4/27/2023	7/17/2023	6/8/2015	12/21/2015	2/26/2019	7/21/2023	5/31/2024	6/8/2015
Hydrostratigraphic Unit	MSC	Lower Aquifer	Lower Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer
Volatile Organic Compounds									
Benzene	5	ND (0.5)	ND (0.5)	ND (1)	ND (0.5)	**380000 (2000)**	**300000 (1000)**	**160000 (500)**	ND (1)
Cumene	3500	ND (1)	ND (0.5)	ND (1)	ND (1)	ND (1000)	ND (1000)	ND (500)	ND (1)
1,2-Dibromoethane	0.05	ND (0.022)	ND (2)	ND (0.04)	ND (0.018)	ND (200)	ND (4000)	ND (2000)	ND (0.04)
1,2-Dichloroethane	5	ND (1)	ND (0.5)	ND (1)	ND (1)	ND (1000)	ND (1000)	ND (500)	ND (1)
Ethyl Benzene	700	ND (1)	ND (0.5)	1.1 (1)	ND (1)	97 J (200)	ND (1000)	ND (500)	2 (1)
Methyl tert-butyl ether	20	ND (1)	0.71 J (1)	ND (1)	ND (1)	ND (200)	ND (2000)	ND (1000)	ND (1)
Toluene	1000	ND (1)	ND (0.75)	1.9 (1)	ND (1)	**84000 (2000)**	**51000 (1500)**	**71000 (750)**	4.2 (1)
1,2,4-Trimethylbenzene	530	ND (2)	NA	1.8 (1)	ND (2)	NA	NA	NA	2.3 (1)
1,3,5-Trimethylbenzene	530	ND (2)	NA	ND (1)	ND (2)	NA	NA	NA	0.7 J (1)
Xylenes (total)	10000	ND (1)	ND (1)	6.7 (3)	ND (1)	240 J (1000)	ND (2000)	ND (1000)	11.5 (3)
Semivolatile Organic Compounds									
Anthracene	66	ND (0.08)	NA	ND (0.1)	ND (0.1)	NA	NA	NA	0.086 J (0.1)
Benzo(a)anthracene	3.9	ND (0.04)	NA	ND (0.1)	ND (0.05)	NA	NA	NA	ND (0.1)
Benzo(a)pyrene	0.2	ND (0.04)	NA	ND (0.1)	ND (0.05)	NA	NA	NA	ND (0.1)
Benzo(b)fluoranthene	1.2	ND (0.04)	NA	ND (0.1)	ND (0.1)	NA	NA	NA	ND (0.1)
Benzo(g,h,i)perylene	0.26	ND (0.08)	NA	ND (0.1)	ND (0.1)	NA	NA	NA	ND (0.1)
Chrysene	1.9	ND (0.08)	NA	ND (0.1)	ND (0.1)	NA	NA	NA	ND (0.1)
Fluorene	1900	ND (0.08)	NA	ND (0.1)	ND (0.1)	NA	NA	NA	0.049 J (0.1)
Naphthalene	100	ND (0.08)	NA	0.39 (0.1)	ND (0.1)	NA	NA	NA	0.33 (0.1)
Phenanthrene	1100	ND (0.08)	NA	ND (0.1)	ND (0.1)	NA	NA	NA	0.088 J (0.1)
Pyrene	130	ND (0.08)	NA	ND (0.1)	ND (0.1)	NA	NA	NA	ND (0.1)
Metals (Dissolved)									
Lead	5	ND (1)	NA	ND (5)	ND (3)	NA	NA	NA	ND (5)

Notes:
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Location	Non-Res GW	S-284	S-284	S-284	S-284D	S-284D	S-284D	S-284D	S-284D
Field Sample ID	Used Aquifer	AOI3_S-284_122315	S-284_20190227	S-284_20200903	AOI3_S-284D_060915	AOI3_S-284D_122315	S-284D_20190226	S-284D_20190619	S-284D_20191028
Sample Date	(TDS ≤ 2500)	12/23/2015	2/27/2019	9/3/2020	6/9/2015	12/23/2015	2/26/2019	6/19/2019	10/28/2019
Hydrostratigraphic Unit	MSC	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer
Volatile Organic Compounds									
Benzene	5	**61.8 (0.5)**	ND (1)	ND (1)	**7.9 (1)**	**62 (0.5)**	0.3 J (1)	ND (1)	0.3 J (1)
Cumene	3500	ND (1)	ND (5)	0.48 J (5)	ND (1)	ND (1)	ND (5)	ND (5)	ND (5)
1,2-Dibromoethane	0.05	ND (0.019)	ND (1)	ND (1)	**0.057 (0.04)**	ND (0.019)	ND (1)	ND (0.029)	ND,XQ (0.028)
1,2-Dichloroethane	5	ND (1)	ND (5)	ND (1)	ND (1)	ND (1)	ND (5)	ND (5)	ND (5)
Ethyl Benzene	700	ND (1)	ND (1)	ND (1)	0.36 J (1)	ND (1)	ND (1)	ND (1)	ND (1)
Methyl tert-butyl ether	20	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	0.6 J (1)	ND (1)
Toluene	1000	48 (1)	ND (1)	ND (1)	7.5 (1)	48.6 (1)	ND (1)	ND (1)	ND (1)
1,2,4-Trimethylbenzene	530	ND (2)	NA	NA	0.77 J (1)	ND (2)	NA	ND (5)	ND (5)
1,3,5-Trimethylbenzene	530	ND (2)	NA	NA	0.23 J (1)	ND (2)	NA	ND (5)	1 J (5)
Xylenes (total)	10000	ND (1)	ND (5)	ND (6)	2.1 J (3)	ND (1)	ND (5)	ND (5)	ND (3)
Semivolatile Organic Compounds									
Anthracene	66	ND (0.1)	NA	NA	ND (1)	ND (0.1)	NA	ND (0.5)	ND (0.5)
Benzo(a)anthracene	3.9	ND (0.05)	NA	NA	ND (1)	ND (0.05)	NA	ND (0.5)	ND (0.5)
Benzo(a)pyrene	0.2	ND (0.05)	NA	NA	ND (1)	ND (0.05)	NA	ND (0.5)	ND (0.5)
Benzo(b)fluoranthene	1.2	ND (0.1)	NA	NA	ND (1)	ND (0.1)	NA	ND (0.5)	ND (0.5)
Benzo(g,h,i)perylene	0.26	ND (0.1)	NA	NA	ND (1)	ND (0.1)	NA	ND (0.5)	ND (0.5)
Chrysene	1.9	ND (0.1)	NA	NA	ND (1)	ND (0.1)	NA	ND (0.5)	ND (0.5)
Fluorene	1900	ND (0.1)	NA	NA	ND (1)	ND (0.1)	NA	ND (0.5)	1 (0.5)
Naphthalene	100	ND (0.1)	NA	NA	ND (1)	ND (0.1)	NA	ND (0.5)	2 (0.5)
Phenanthrene	1100	ND (0.1)	NA	NA	ND (1)	ND (0.1)	NA	ND (0.5)	2 (0.5)
Pyrene	130	ND (0.1)	NA	NA	ND (1)	ND (0.1)	NA	ND (0.5)	ND (0.5)
Metals (Dissolved)									
Lead	5	ND (3)	NA	NA	ND (5)	ND (3)	NA	ND (3)	ND (0.5)

Notes:
1 All concentrations reported in ug/L (ppb); detection limits in parentheses.
2 XQ is an unknown qualifier.
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Location	Non-Res GW	S-284D	S-284D	S-284D	S-284D	S-382	S-382	S-382	S-382
Field Sample ID	Used Aquifer	S-284D_20200901	S-284D_20210423	S-284D_20220404	S-284D_20230426	AOI3_S-382_060915	AOI3_S-382_121615	S-382_20180629	S-382_DUP_20180629
Sample Date	(TDS ≤ 2500)	9/1/2020	4/23/2021	4/4/2022	4/26/2023	6/9/2015	12/16/2015	6/29/2018	6/29/2018
Hydrostratigraphic Unit	MSC	Lower Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer
Volatile Organic Compounds									
Benzene	5	ND (1)	**10 (1)**	ND (0.5)	ND (0.5)	**48800 (1000)**	**146000 (1000)**	**478000 SL (25000)**	**515000 SL (5000)**
Cumene	3500	ND (5)	ND (5)	ND (1)	ND (1)	0.25 J (1)	ND (50)	NA	NA
1,2-Dibromoethane	0.05	ND (1)	ND (0.029)	ND (0.02)	ND (0.021)	**0.23 (0.04)**	ND (0.019)	NA	NA
1,2-Dichloroethane	5	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (50)	NA	NA
Ethyl Benzene	700	ND (1)	0.55 J (1)	ND (1)	ND (1)	8.7 (1)	59.3 (50)	ND,SL (1000)	ND,SL (500)
Methyl tert-butyl ether	20	ND (1)	1.3 (1)	1.3 (1)	1.6 (1)	ND (1)	ND (50)	NA	NA
Toluene	1000	ND (1)	4.2 (1)	ND (1)	ND (1)	**19800 (1000)**	**79600 (2000)**	**75700 SL (1000)**	**70700 SL (500)**
1,2,4-Trimethylbenzene	530	NA	1.1 J (5)	ND (2)	ND (2)	2.8 (1)	22.3 J (100)	NA	NA
1,3,5-Trimethylbenzene	530	NA	0.43 J (5)	ND (2)	ND (2)	0.87 J (1)	ND (100)	NA	NA
Xylenes (total)	10000	ND (6)	6 (6)	ND (1)	ND (1)	40.7 (3)	354 (50)	ND,SL (3000)	ND,SL (1500)
Semivolatile Organic Compounds									
Anthracene	66	NA	ND (0.57)	ND (0.077)	ND (0.08)	ND (1)	ND (0.1)	NA	NA
Benzo(a)anthracene	3.9	NA	ND (0.57)	ND (0.038)	ND (0.04)	ND (1)	ND (0.05)	NA	NA
Benzo(a)pyrene	0.2	NA	ND (0.57)	ND (0.038)	ND (0.04)	ND (1)	ND (0.05)	NA	NA
Benzo(b)fluoranthene	1.2	NA	ND (0.57)	ND (0.038)	ND (0.04)	ND (1)	ND (0.1)	NA	NA
Benzo(g,h,i)perylene	0.26	NA	ND (0.57)	ND (0.077)	ND (0.08)	ND (1)	ND (0.1)	NA	NA
Chrysene	1.9	NA	ND (0.57)	ND (0.077)	ND (0.08)	ND (1)	ND (0.1)	NA	NA
Fluorene	1900	NA	ND (0.57)	ND (0.077)	ND (0.08)	ND (1)	ND (0.1)	NA	NA
Naphthalene	100	NA	0.22 J (0.57)	ND (0.077)	ND (0.08)	0.39 J (1)	0.47 (0.1)	NA	NA
Phenanthrene	1100	NA	ND (0.57)	ND (0.077)	ND (0.08)	ND (1)	0.121 (0.1)	NA	NA
Pyrene	130	NA	ND (0.57)	ND (0.077)	ND (0.08)	ND (1)	ND (0.1)	NA	NA
Metals (Dissolved)									
Lead	5	NA	ND (0.52)	ND (1)	ND (1)	ND (5)	ND (3)	NA	NA

Notes:
1 All concentrations reported in ug/L (ppb); detection limits in parentheses.
2 XQ is an unknown qualifier.
3 Boldfaced concentrations exceed the Non-Res GW Used Aquifer (TDS ≤ 2500) MSC.

Abbreviations:
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Bellwether District Holdings, LLC , Philadelphia, PA

Location	Non-Res GW	S-382	S-382	S-382	S-382	S-382	S-382	S-382	S-382
Field Sample ID	Used Aquifer	S-382_20190226	S-382_SL_20230721	S-382_20240906	S-382_20241008	S-382_20241107	S-382_20241218	S-382_20250203	S-382_20250401
Sample Date	(TDS ≤ 2500)	2/26/2019	7/21/2023	9/6/2024	10/8/2024	11/7/2024	12/18/2024	2/3/2025	4/1/2025
Hydrostratigraphic Unit	MSC	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer
Volatile Organic Compounds									
Benzene	5	**580000 (2000)**	**200000 (1000)**	**170000 (500)**	**120000 (500)**	**130000 (500)**	**150000 (500)**	**130000 (500)**	**120000 (500)**
Cumene	3500	ND (1000)	ND (1000)	ND (500)	ND (500)	ND (500)	ND (500)	ND (500)	ND (500)
1,2-Dibromoethane	0.05	ND (200)	ND (4000)	ND (2000)	ND (2000)	ND (2000)	ND (2000)	ND (2000)	ND (2000)
1,2-Dichloroethane	5	ND (1000)	ND (1000)	ND (500)	ND (500)	ND (500)	ND (500)	ND (500)	ND (500)
Ethyl Benzene	700	ND (200)	ND (1000)	ND (500)	ND (500)	ND (500)	ND (500)	ND (500)	ND (500)
Methyl tert-butyl ether	20	ND (200)	ND (2000)	ND (1000)	ND (1000)	ND (1000)	ND (1000)	ND (1000)	ND (1000)
Toluene	1000	**69000 (2000)**	**69000 (1500)**	**48000 (750)**	**44000 (750)**	**51000 (750)**	**46000 (750)**	**44000 (750)**	**39000 (750)**
1,2,4-Trimethylbenzene	530	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	530	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	10000	ND (1000)	ND (2000)	ND (1000)	ND (1000)	ND (1000)	ND (1000)	ND (1000)	ND (1000)
Semivolatile Organic Compounds									
Anthracene	66	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	3.9	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.2	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	1.2	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	0.26	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	1.9	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	1900	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	100	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1100	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	130	NA	NA	NA	NA	NA	NA	NA	NA
Metals (Dissolved)									
Lead	5	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations reported in ug/L (ppb); detection limits in parentheses.
2 XQ is an unknown qualifier.
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Abbreviations:
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Bellwether District Holdings, LLC , Philadelphia, PA

Location	Non-Res GW	S-383	S-383	S-383	S-383	S-411	S-411	S-411	S-411
Field Sample ID	Used Aquifer	AOI3_S-383_060915	AOI3_S-383_121715	S-383_20190227	S-383_20200909	AOI3_S-411_121615	S-411-20160408-WG	S-411_20180627	S-411_20190227
Sample Date	(TDS ≤ 2500)	6/9/2015	12/17/2015	2/27/2019	9/9/2020	12/16/2015	4/8/2016	6/27/2018	2/27/2019
Hydrostratigraphic Unit	MSC	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer
Volatile Organic Compounds									
Benzene	5	**12.3 (1)**	**651 (5)**	ND (1)	ND (1)	**1020 (25)**	2.7 (1)	3.14 (1)	**7 (1)**
Cumene	3500	7.5 (1)	3 (1)	0.9 J (5)	0.63 J (5)	ND (5)	ND (1)	NA	ND (5)
1,2-Dibromoethane	0.05	**0.051 (0.04)**	ND (0.02)	ND (1)	ND (1)	ND (0.019)	ND (0.04)	NA	ND (1)
1,2-Dichloroethane	5	ND (1)	ND (1)	ND (5)	ND (1)	ND (5)	ND (1)	NA	ND (5)
Ethyl Benzene	700	0.57 J (1)	ND (1)	ND (1)	ND (1)	ND (5)	ND (1)	ND (1)	ND (1)
Methyl tert-butyl ether	20	ND (1)	ND (1)	ND (1)	ND (1)	ND (5)	ND (1)	NA	ND (1)
Toluene	1000	12.6 (1)	229 (10)	ND (1)	0.59 J (1)	ND (5)	ND (1)	ND (1)	ND (1)
1,2,4-Trimethylbenzene	530	0.56 J (1)	ND (2)	NA	NA	ND (10)	ND (1)	NA	NA
1,3,5-Trimethylbenzene	530	ND (1)	ND (2)	NA	NA	ND (10)	ND (1)	NA	NA
Xylenes (total)	10000	3.2 (3)	0.74 J (1)	ND (5)	ND (6)	ND (5)	ND (3)	ND (3)	ND (5)
Semivolatile Organic Compounds									
Anthracene	66	ND (1)	ND (0.11)	NA	NA	ND (0.1)	0.017 J (0.11)	NA	NA
Benzo(a)anthracene	3.9	ND (1)	ND (0.055)	NA	NA	ND (0.05)	ND (0.11)	NA	NA
Benzo(a)pyrene	0.2	ND (1)	ND (0.055)	NA	NA	ND (0.05)	ND (0.11)	NA	NA
Benzo(b)fluoranthene	1.2	ND (1)	ND (0.11)	NA	NA	ND (0.1)	ND (0.11)	NA	NA
Benzo(g,h,i)perylene	0.26	ND (1)	ND (0.11)	NA	NA	ND (0.1)	ND (0.11)	NA	NA
Chrysene	1.9	ND (1)	ND (0.11)	NA	NA	ND (0.1)	ND (0.11)	NA	NA
Fluorene	1900	4 (1)	1.39 (0.11)	NA	NA	ND (0.1)	0.04 J (0.11)	NA	NA
Naphthalene	100	ND (1)	ND (0.11)	NA	NA	ND (0.1)	0.44 (0.11)	NA	NA
Phenanthrene	1100	8.2 (1)	2.15 (0.11)	NA	NA	ND (0.1)	0.097 J (0.11)	NA	NA
Pyrene	130	ND (1)	0.246 (0.11)	NA	NA	ND (0.1)	ND (0.11)	NA	NA
Metals (Dissolved)									
Lead	5	ND (5)	ND (3)	NA	NA	ND (3)	ND (5)	NA	NA

Notes:
1 All concentrations reported in ug/L (ppb); detection limits in parentheses.
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3 Boldfaced concentrations exceed the Non-Res GW Used Aquifer (TDS ≤ 2500) MSC.

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Bellwether District Holdings, LLC , Philadelphia, PA

Location	Non-Res GW	S-411	S-411	S-411	S-411	S-411	S-411	S-411	S-411
Field Sample ID	Used Aquifer	S-411_20190626	S-411_20191029	S-411_20200902	S-411_20210427	S-411_20220324	S-411_20230428	S-411_20230717	S-411_20240426
Sample Date	(TDS ≤ 2500)	6/26/2019	10/29/2019	9/2/2020	4/27/2021	3/24/2022	4/28/2023	7/17/2023	4/26/2024
Hydrostratigraphic Unit	MSC	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer
Volatile Organic Compounds									
Benzene	5	0.9 J (1)	ND (1)	0.58 J (1)	0.99 J (1)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Cumene	3500	ND (5)	ND (5)	ND (5)	ND (5)	ND (1)	ND (1)	ND (0.5)	ND (1)
1,2-Dibromoethane	0.05	ND (0.028)	ND (0.028)	ND (1)	ND (0.029)	ND (0.02)	ND (0.02)	ND (2)	ND (0.021)
1,2-Dichloroethane	5	ND (5)	ND (5)	ND (1)	ND (1)	ND (1)	ND (1)	ND (0.5)	ND (1)
Ethyl Benzene	700	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (0.5)	ND (1)
Methyl tert-butyl ether	20	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Toluene	1000	ND (1)	ND (1)	ND (1)	1.5 (1)	ND (1)	ND (1)	ND (0.75)	ND (1)
1,2,4-Trimethylbenzene	530	ND (5)	ND (5)	NA	ND (5)	ND (2)	ND (2)	NA	ND (2)
1,3,5-Trimethylbenzene	530	ND (5)	ND (5)	NA	0.74 J (5)	ND (2)	ND (2)	NA	ND (2)
Xylenes (total)	10000	ND (5)	ND (3)	ND (6)	ND (6)	ND (1)	ND (1)	ND (1)	ND (1)
Semivolatile Organic Compounds									
Anthracene	66	ND (0.5)	ND (0.5)	NA	ND (0.51)	ND (0.087)	ND (0.08)	NA	ND (0.08)
Benzo(a)anthracene	3.9	ND (0.5)	ND (0.5)	NA	ND (0.51)	ND (0.043)	0.0254 J (0.04)	NA	0.0315 J (0.04)
Benzo(a)pyrene	0.2	ND (0.5)	ND (0.5)	NA	ND (0.51)	ND (0.043)	ND (0.04)	NA	ND (0.04)
Benzo(b)fluoranthene	1.2	ND (0.5)	ND (0.5)	NA	ND (0.51)	ND (0.043)	0.0703 (0.04)	NA	0.031 J (0.04)
Benzo(g,h,i)perylene	0.26	ND (0.5)	ND (0.5)	NA	ND (0.51)	ND (0.087)	0.112 (0.08)	NA	ND (0.08)
Chrysene	1.9	ND (0.5)	ND (0.5)	NA	ND (0.51)	ND (0.087)	ND (0.08)	NA	ND (0.08)
Fluorene	1900	ND (0.5)	ND (0.5)	NA	ND (0.51)	ND (0.087)	ND (0.08)	NA	ND (0.08)
Naphthalene	100	ND (0.5)	ND (0.5)	NA	ND (0.51)	ND (0.087)	ND (0.08)	NA	ND (0.08)
Phenanthrene	1100	ND (0.5)	ND (0.5)	NA	ND (0.51)	0.0454 J (0.087)	0.0414 J (0.08)	NA	ND (0.08)
Pyrene	130	ND (0.5)	ND (0.5)	NA	ND (0.51)	ND (0.087)	ND (0.08)	NA	ND (0.08)
Metals (Dissolved)									
Lead	5	ND (3)	ND (0.5)	NA	0.16 J (0.52)	ND (1)	ND (1)	NA	ND (1)

Notes:
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Bellwether District Holdings, LLC , Philadelphia, PA

Location	Non-Res GW	S-412	S-412	S-412	S-412	S-413	S-413	S-413	S-413
Field Sample ID	Used Aquifer	AOI3_S-412_121415	S-412-20160408-WG	S-412_20190227	S-412_20200909	AOI3_S-413_122115	S-413-20160407-WG	S-413_20190226	S-413_20200902
Sample Date	(TDS ≤ 2500)	12/14/2015	4/8/2016	2/27/2019	9/9/2020	12/21/2015	4/7/2016	2/26/2019	9/2/2020
Hydrostratigraphic Unit	MSC	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer
Volatile Organic Compounds									
Benzene	5	ND (0.5)	**76.5 (1)**	0.3 J (1)	ND (1)	**487 (5)**	**267 (1)**	1 (1)	ND (1)
Cumene	3500	5.8 (1)	28.1 (1)	27 (5)	12 (5)	15.8 (1)	36 (1)	17 (5)	30 (5)
1,2-Dibromoethane	0.05	ND (0.019)	ND (0.04)	ND (1)	ND (1)	ND (0.018)	ND (0.04)	ND (1)	ND (1)
1,2-Dichloroethane	5	ND (1)	ND (1)	ND (5)	ND (1)	ND (1)	ND (1)	ND (5)	ND (1)
Ethyl Benzene	700	ND (1)	ND (1)	ND (1)	ND (1)	3.2 (1)	4.5 (1)	0.3 J (1)	ND (1)
Methyl tert-butyl ether	20	ND (1)	0.23 J (1)	ND (1)	0.28 J (1)	1.2 (1)	1.3 (1)	ND (1)	ND (1)
Toluene	1000	ND (1)	13.9 (1)	ND (1)	ND (1)	115 (1)	0.82 J (1)	0.2 J (1)	0.64 J (1)
1,2,4-Trimethylbenzene	530	2 (2)	1.5 (1)	NA	NA	69.7 (2)	87.7 (1)	NA	NA
1,3,5-Trimethylbenzene	530	0.53 J (2)	ND (1)	NA	NA	9.4 (2)	15.2 (1)	NA	NA
Xylenes (total)	10000	ND (1)	ND (3)	ND (5)	ND (6)	6.1 (1)	6.2 (3)	ND (5)	ND (6)
Semivolatile Organic Compounds									
Anthracene	66	ND (0.1)	0.21 (0.11)	NA	NA	0.336 (0.1)	2 (0.1)	NA	NA
Benzo(a)anthracene	3.9	ND (0.05)	ND (0.11)	NA	NA	ND (0.05)	0.038 J (0.1)	NA	NA
Benzo(a)pyrene	0.2	ND (0.05)	ND (0.11)	NA	NA	ND (0.05)	ND (0.1)	NA	NA
Benzo(b)fluoranthene	1.2	ND (0.1)	ND (0.11)	NA	NA	ND (0.1)	0.039 J (0.1)	NA	NA
Benzo(g,h,i)perylene	0.26	ND (0.1)	ND (0.11)	NA	NA	ND (0.1)	ND (0.1)	NA	NA
Chrysene	1.9	ND (0.1)	ND (0.11)	NA	NA	ND (0.1)	0.098 J (0.1)	NA	NA
Fluorene	1900	ND (0.1)	3.2 (0.11)	NA	NA	1.43 (0.1)	12.1 (0.1)	NA	NA
Naphthalene	100	ND (0.1)	2.2 (0.11)	NA	NA	27.5 (1)	**178 (2.1)**	NA	NA
Phenanthrene	1100	ND (0.1)	3.4 (0.11)	NA	NA	ND (0.1)	48.8 (2.1)	NA	NA
Pyrene	130	ND (0.1)	0.048 J (0.11)	NA	NA	0.107 (0.1)	1.7 (0.1)	NA	NA
Metals (Dissolved)									
Lead	5	ND (3)	ND (5)	NA	NA	ND (3)	ND (5)	NA	NA

Notes:
1 All concentrations reported in ug/L (ppb); detection limits in parentheses.
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3 Boldfaced concentrations exceed the Non-Res GW Used Aquifer (TDS ≤ 2500) MSC.

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Bellwether District Holdings, LLC , Philadelphia, PA

Location	Non-Res GW	S-414	S-414	S-414	S-414	S-414	S-414	S-414	S-414
Field Sample ID	Used Aquifer	AOI3_S-414_121615	S-414-20160408-WG	S-414_20180702	S-414_HS-20180702	S-414_20190226	S-414_20230718	S-414_20240905	S-414_20241008
Sample Date	(TDS ≤ 2500)	12/16/2015	4/8/2016	7/2/2018	7/2/2018	2/26/2019	7/18/2023	9/5/2024	10/8/2024
Hydrostratigraphic Unit	MSC	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer
Volatile Organic Compounds									
Benzene	5	**93700 (1000)**	**48900 (500)**	**255000 SL (5000)**	**249000 SL (5000)**	**460000 (2000)**	**450000 (2500)**	**330000 (1000)**	**230000 (1000)**
Cumene	3500	ND (250)	1.3 (1)	NA	NA	ND (1000)	ND (500)	ND (1000)	ND (1000)
1,2-Dibromoethane	0.05	ND (0.019)	ND (0.04)	NA	NA	ND (200)	ND (2000)	ND (4000)	ND (4000)
1,2-Dichloroethane	5	ND (250)	ND (1)	NA	NA	ND (1000)	ND (500)	ND (1000)	ND (1000)
Ethyl Benzene	700	ND (250)	10.2 (1)	ND,SL (500)	ND,SL (1000)	ND (200)	ND (500)	ND (1000)	ND (1000)
Methyl tert-butyl ether	20	ND (250)	ND (1)	NA	NA	ND (200)	ND (1000)	ND (2000)	ND (2000)
Toluene	1000	**30700 (250)**	**4980 (50)**	**39400 SL (500)**	**54400 SL (1000)**	**55000 (200)**	**61000 (750)**	**40000 (1500)**	**41000 (1500)**
1,2,4-Trimethylbenzene	530	ND (500)	1.9 (1)	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	530	ND (500)	1.9 (1)	NA	NA	NA	NA	NA	NA
Xylenes (total)	10000	ND (250)	26.9 (3)	ND,SL (1500)	ND,SL (3000)	ND (1000)	ND (1000)	ND (2000)	ND (2000)
Semivolatile Organic Compounds									
Anthracene	66	0.125 (0.1)	0.05 J (0.11)	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	3.9	ND (0.05)	ND (0.11)	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.2	ND (0.05)	ND (0.11)	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	1.2	ND (0.1)	ND (0.11)	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	0.26	ND (0.1)	ND (0.11)	NA	NA	NA	NA	NA	NA
Chrysene	1.9	ND (0.1)	ND (0.11)	NA	NA	NA	NA	NA	NA
Fluorene	1900	0.56 (0.1)	0.14 (0.11)	NA	NA	NA	NA	NA	NA
Naphthalene	100	0.561 (0.1)	0.61 (0.11)	NA	NA	NA	NA	NA	NA
Phenanthrene	1100	1.08 (0.1)	0.28 (0.11)	NA	NA	NA	NA	NA	NA
Pyrene	130	ND (0.1)	0.029 J (0.11)	NA	NA	NA	NA	NA	NA
Metals (Dissolved)									
Lead	5	ND (3)	ND (5)	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations reported in ug/L (ppb); detection limits in parentheses.
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3 Boldfaced concentrations exceed the Non-Res GW Used Aquifer (TDS ≤ 2500) MSC.

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Bellwether District Holdings, LLC , Philadelphia, PA

Location	Non-Res GW	S-414	S-414	S-414	S-414	S-428	S-428	S-428	S-429
Field Sample ID	Used Aquifer	S-414_20241107	S-414_20241218	S-414_20250203	S-414_20250401	S-428_20190227	S-428_20200903	S-428_20230718	S-429_20190226
Sample Date	(TDS ≤ 2500)	11/7/2024	12/18/2024	2/3/2025	4/1/2025	2/27/2019	9/3/2020	7/18/2023	2/26/2019
Hydrostratigraphic Unit	MSC	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer
Volatile Organic Compounds									
Benzene	5	**300000 (1000)**	**220000 (1000)**	**160000 (1000)**	**160000 (1000)**	**42 (1)**	**210 (1)**	**98 (0.5)**	**480000 (2000)**
Cumene	3500	ND (1000)	ND (1000)	ND (1000)	ND (1000)	13 (5)	15 (5)	5.8 (0.5)	ND (1000)
1,2-Dibromoethane	0.05	ND (4000)	ND (4000)	ND (4000)	ND (4000)	ND (1)	ND (1)	ND (2)	ND (200)
1,2-Dichloroethane	5	ND (1000)	ND (1000)	ND (1000)	ND (1000)	ND (5)	5 (1)	ND (0.5)	ND (1000)
Ethyl Benzene	700	ND (1000)	ND (1000)	ND (1000)	ND (1000)	20 (1)	2.4 (1)	ND (0.5)	ND (200)
Methyl tert-butyl ether	20	ND (2000)	ND (2000)	ND (2000)	ND (2000)	ND (1)	ND (1)	ND (1)	ND (200)
Toluene	1000	**54000 (1500)**	**42000 (1500)**	**35000 (1500)**	**33000 (1500)**	0.5 J (1)	0.66 J (1)	15 (0.75)	**44000 (200)**
1,2,4-Trimethylbenzene	530	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	530	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	10000	ND (2000)	ND (2000)	ND (2000)	ND (2000)	14 (5)	5.6 J (6)	ND (1)	ND (1000)
Semivolatile Organic Compounds									
Anthracene	66	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	3.9	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.2	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	1.2	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	0.26	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	1.9	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	1900	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	100	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1100	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	130	NA	NA	NA	NA	NA	NA	NA	NA
Metals (Dissolved)									
Lead	5	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations reported in ug/L (ppb); detection limits in parentheses.
2 XQ is an unknown qualifier.
3 Boldfaced concentrations exceed the Non-Res GW Used Aquifer (TDS ≤ 2500) MSC.

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Location	Non-Res GW	S-429	S-429	S-429	S-429	S-429	S-429	S-429	S-430
Field Sample ID	Used Aquifer	S-429_20230718	S-429_20240906	S-429_20241008	S-429_20241107	S-429_20241219	S-429_20250203	S-429_20250401	S-430_20190226
Sample Date	(TDS ≤ 2500)	7/18/2023	9/6/2024	10/8/2024	11/7/2024	12/19/2024	2/3/2025	4/1/2025	2/26/2019
Hydrostratigraphic Unit	MSC	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer
Volatile Organic Compounds									
Benzene	5	**230000 (1000)**	**220000 (1000)**	**250000 (1000)**	**220000 (1000)**	**180000 (1000)**	**200000 (1000)**	**170000 (1000)**	**160000 (2000)**
Cumene	3500	ND (1000)	ND (1000)	ND (1000)	ND (1000)	ND (1000)	ND (1000)	ND (1000)	ND (1000)
1,2-Dibromoethane	0.05	ND (4000)	ND (4000)	ND (4000)	ND (4000)	ND (4000)	ND (4000)	ND (4000)	ND (200)
1,2-Dichloroethane	5	ND (1000)	ND (1000)	ND (1000)	ND (1000)	ND (1000)	ND (1000)	ND (1000)	ND (1000)
Ethyl Benzene	700	ND (1000)	ND (1000)	ND (1000)	ND (1000)	ND (1000)	ND (1000)	ND (1000)	40 J (200)
Methyl tert-butyl ether	20	ND (2000)	ND (2000)	ND (2000)	ND (2000)	ND (2000)	ND (2000)	ND (2000)	ND (200)
Toluene	1000	**32000 (1500)**	**16000 (1500)**	**19000 (1500)**	**14000 (1500)**	**12000 (1500)**	**21000 (1500)**	**14000 (1500)**	**59000 (200)**
1,2,4-Trimethylbenzene	530	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	530	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	10000	ND (2000)	ND (2000)	ND (2000)	ND (2000)	ND (2000)	ND (2000)	ND (2000)	ND (1000)
Semivolatile Organic Compounds									
Anthracene	66	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	3.9	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.2	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	1.2	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	0.26	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	1.9	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	1900	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	100	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1100	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	130	NA	NA	NA	NA	NA	NA	NA	NA
Metals (Dissolved)									
Lead	5	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations reported in ug/L (ppb); detection limits in parentheses.
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Location	Non-Res GW	S-430	S-430	S-430	S-431	S-431	S-431	S-433	S-433
Field Sample ID	Used Aquifer	S-430_20230718	S-430_20240603	S-430_20240910	S-431_20190226	S-431_20230718	S-431_20240910	S-433-20200903	S-433_20200909
Sample Date	(TDS ≤ 2500)	7/18/2023	6/3/2024	9/10/2024	2/26/2019	7/18/2023	9/10/2024	9/3/2020	9/9/2020
Hydrostratigraphic Unit	MSC	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer
Volatile Organic Compounds									
Benzene	5	**4200 (12)**	**9100 (25)**	**2500 (10)**	**590000 (2000)**	**23 (0.5)**	**78 (2.5)**	1.2 (1)	0.53 J (1)
Cumene	3500	ND (12)	ND (25)	ND (10)	ND (1000)	1.1 (0.5)	1.9 J (2.5)	ND (5)	ND (5)
1,2-Dibromoethane	0.05	ND (50)	ND (100)	ND (40)	ND (200)	ND (2)	ND (10)	ND (1)	ND (1)
1,2-Dichloroethane	5	ND (12)	ND (25)	ND (10)	ND (1000)	ND (0.5)	ND (2.5)	ND (1)	ND (1)
Ethyl Benzene	700	16 (12)	16 J (25)	10 (10)	ND (200)	ND (0.5)	ND (2.5)	ND (1)	ND (1)
Methyl tert-butyl ether	20	ND (25)	ND (50)	ND (20)	ND (200)	ND (1)	ND (5)	ND (1)	ND (1)
Toluene	1000	**1800 (19)**	ND (38)	5.4 J (15)	**59000 (200)**	3.9 (0.75)	4.9 (3.8)	ND (1)	ND (1)
1,2,4-Trimethylbenzene	530	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	530	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	10000	52.5 J (25)	82 J (50)	36 J (20)	ND (1000)	1.4 J (1)	ND (5)	ND (6)	ND (6)
Semivolatile Organic Compounds									
Anthracene	66	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	3.9	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.2	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	1.2	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	0.26	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	1.9	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	1900	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	100	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1100	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	130	NA	NA	NA	NA	NA	NA	NA	NA
Metals (Dissolved)									
Lead	5	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations reported in ug/L (ppb); detection limits in parentheses.
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Location	Non-Res GW	S-433	S-433	S-434	S-434	S-435	S-435	S-435	S-436
Field Sample ID	Used Aquifer	S-433_20230718	S-433_20240909	S-434_20200909	S-434_20230719	S-435_20200909	S-435_20230719	S-435_20240603	S-436_20200910
Sample Date	(TDS ≤ 2500)	7/18/2023	9/9/2024	9/9/2020	7/19/2023	9/9/2020	7/19/2023	6/3/2024	9/10/2020
Hydrostratigraphic Unit	MSC	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer
Volatile Organic Compounds									
Benzene	5	**21 (0.5)**	**130 (0.5)**	ND (1)	**19 (0.5)**	0.63 J (1)	**55 (0.5)**	3.8 (0.5)	ND (1)
Cumene	3500	ND (0.5)	ND (0.5)	ND (5)	ND (0.5)	ND (5)	ND (0.5)	ND (0.5)	0.2 J (5)
1,2-Dibromoethane	0.05	ND (2)	ND (2)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (1)
1,2-Dichloroethane	5	ND (0.5)	ND (0.5)	ND (1)	ND (0.5)	ND (1)	ND (0.5)	ND (0.5)	ND (1)
Ethyl Benzene	700	ND (0.5)	ND (0.5)	ND (1)	ND (0.5)	ND (1)	ND (0.5)	ND (0.5)	ND (1)
Methyl tert-butyl ether	20	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	0.26 J (1)	ND (1)
Toluene	1000	3.8 (0.75)	2.1 (0.75)	ND (1)	0.87 (0.75)	ND (1)	2.3 (0.75)	0.62 J (0.75)	ND (1)
1,2,4-Trimethylbenzene	530	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	530	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	10000	ND (1)	0.86 J (1)	ND (6)	ND (1)	ND (6)	ND (1)	ND (1)	ND (6)
Semivolatile Organic Compounds									
Anthracene	66	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	3.9	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.2	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	1.2	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	0.26	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	1.9	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	1900	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	100	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1100	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	130	NA	NA	NA	NA	NA	NA	NA	NA
Metals (Dissolved)									
Lead	5	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations reported in ug/L (ppb); detection limits in parentheses.
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Location	Non-Res GW	S-437	S-437	S-437	S-437	S-437	S-437	S-437	S-438
Field Sample ID	Used Aquifer	S-437_20230720	S-437_20240905	S-437_20241008	S-437_20241107	S-437_20241218	S-437_20250203	S-437_20250401	S-438_20230720
Sample Date	(TDS ≤ 2500)	7/20/2023	9/5/2024	10/8/2024	11/7/2024	12/18/2024	2/3/2025	4/1/2025	7/20/2023
Hydrostratigraphic Unit	MSC	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer
Volatile Organic Compounds									
Benzene	5	**260000 (1000)**	**170000 (1000)**	**120000 (500)**	**130000 (500)**	**140000 (500)**	**150000 (500)**	**230000 (1000)**	**230000 (1000)**
Cumene	3500	ND (1000)	ND (1000)	ND (500)	ND (500)	ND (500)	ND (500)	ND (1000)	40 J (100)
1,2-Dibromoethane	0.05	ND (4000)	ND (4000)	ND (2000)	ND (2000)	ND (2000)	ND (2000)	ND (4000)	ND (400)
1,2-Dichloroethane	5	ND (1000)	ND (1000)	ND (500)	ND (500)	ND (500)	ND (500)	ND (1000)	ND (100)
Ethyl Benzene	700	ND (1000)	ND (1000)	ND (500)	ND (500)	ND (500)	ND (500)	ND (1000)	37 J (100)
Methyl tert-butyl ether	20	ND (2000)	ND (2000)	ND (1000)	ND (1000)	ND (1000)	ND (1000)	ND (2000)	ND (200)
Toluene	1000	**64000 (1500)**	**23000 (1500)**	**24000 (750)**	**29000 (750)**	**28000 (750)**	**30000 (750)**	**47000 (1500)**	**23000 (150)**
1,2,4-Trimethylbenzene	530	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	530	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	10000	ND (2000)	ND (2000)	ND (1000)	ND (1000)	ND (1000)	ND (1000)	ND (2000)	187 J (200)
Semivolatile Organic Compounds									
Anthracene	66	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	3.9	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.2	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	1.2	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	0.26	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	1.9	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	1900	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	100	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1100	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	130	NA	NA	NA	NA	NA	NA	NA	NA
Metals (Dissolved)									
Lead	5	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations reported in ug/L (ppb); detection limits in parentheses.
2 XQ is an unknown qualifier.
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Location	Non-Res GW	S-438	S-439	S-439	S-479	S-479	S-480	S-480	S-480
Field Sample ID	Used Aquifer	S-438_20240909	S-439_20230720	S-439_20240909	S-479_20230725	S-479_20240909	S-480_SL_20220414	S-480_SL_20230724	S-480_20240906
Sample Date	(TDS ≤ 2500)	9/9/2024	7/20/2023	9/9/2024	7/25/2023	9/9/2024	4/14/2022	7/21/2023	9/6/2024
Hydrostratigraphic Unit	MSC	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer
Volatile Organic Compounds									
Benzene	5	**270000 (1000)**	**180000 (500)**	**150000 (500)**	**1000 (5)**	**1000 (5)**	**172 SL (0.5)**	**23 (0.5)**	**320 (2)**
Cumene	3500	ND (1000)	ND (500)	ND (500)	ND (5)	ND (5)	25 SL (1)	16 (0.5)	28 (2)
1,2-Dibromoethane	0.05	ND (4000)	ND (2000)	ND (2000)	ND (20)	ND (20)	ND,SL (0.021)	ND (2)	ND (8)
1,2-Dichloroethane	5	ND (1000)	ND (500)	ND (500)	ND (5)	ND (5)	ND,SL (1)	ND (0.5)	ND (2)
Ethyl Benzene	700	ND (1000)	ND (500)	ND (500)	1.9 J (5)	1.7 J (5)	118 SL (1)	31 (0.5)	230 (2)
Methyl tert-butyl ether	20	ND (2000)	ND (1000)	ND (1000)	ND (10)	ND (10)	7.7 SL (1)	6.2 (1)	9.7 (4)
Toluene	1000	**22000 (1500)**	**18000 (750)**	**13000 (750)**	160 (7.5)	12 (7.5)	3.4 SL (1)	0.92 (0.75)	2.5 J (3)
1,2,4-Trimethylbenzene	530	NA	NA	NA	NA	NA	118 SL (2)	NA	NA
1,3,5-Trimethylbenzene	530	NA	NA	NA	NA	NA	36.2 SL (2)	NA	NA
Xylenes (total)	10000	ND (2000)	ND (1000)	ND (1000)	10.2 J (10)	9.7 J (10)	311 SL (1)	110.69 J (1)	873 J (4)
Semivolatile Organic Compounds									
Anthracene	66	NA	NA	NA	NA	NA	0.42 SL (0.071)	NA	NA
Benzo(a)anthracene	3.9	NA	NA	NA	NA	NA	0.036 SL (0.036)	NA	NA
Benzo(a)pyrene	0.2	NA	NA	NA	NA	NA	ND,SL (0.036)	NA	NA
Benzo(b)fluoranthene	1.2	NA	NA	NA	NA	NA	0.0237 J,SL (0.036)	NA	NA
Benzo(g,h,i)perylene	0.26	NA	NA	NA	NA	NA	ND,SL (0.071)	NA	NA
Chrysene	1.9	NA	NA	NA	NA	NA	0.0379 J,SL (0.071)	NA	NA
Fluorene	1900	NA	NA	NA	NA	NA	1.73 SL (0.071)	NA	NA
Naphthalene	100	NA	NA	NA	NA	NA	27.9 SL (0.71)	NA	NA
Phenanthrene	1100	NA	NA	NA	NA	NA	4.9 SL (0.71)	NA	NA
Pyrene	130	NA	NA	NA	NA	NA	0.345 SL (0.071)	NA	NA
Metals (Dissolved)									
Lead	5	NA	NA	NA	NA	NA	ND,SL (1)	NA	NA

Notes:
1 All concentrations reported in ug/L (ppb); detection limits in parentheses.
2 XQ is an unknown qualifier.
3 Boldfaced concentrations exceed the Non-Res GW Used Aquifer (TDS ≤ 2500) MSC.

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Bellwether District Holdings, LLC , Philadelphia, PA

Location	Non-Res GW	S-481	S-481	S-482	S-482	S-482	S-482	S-483	S-484
Field Sample ID	Used Aquifer	S-481_20230721	S-481_20240909	S-482_20230720	S-482_20240909	S-482_20250203	S-482_20250402	S-483_20230725	S-484_20230719
Sample Date	(TDS ≤ 2500)	7/21/2023	9/9/2024	7/20/2023	9/9/2024	2/4/2025	4/2/2025	7/25/2023	7/19/2023
Hydrostratigraphic Unit	MSC	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer
Volatile Organic Compounds									
Benzene	5	**35000 (250)**	**150000 (500)**	**430000 (2500)**	**600000 (2000)**	**420000 (1200)**	**260000 (1000)**	**1100 (10)**	**780000 (2500)**
Cumene	3500	ND (100)	ND (500)	ND (2500)	ND (2000)	ND (1200)	ND (1000)	ND (10)	ND (1000)
1,2-Dibromoethane	0.05	ND (400)	ND (2000)	ND (10000)	ND (8000)	ND (5000)	ND (4000)	ND (40)	ND (4000)
1,2-Dichloroethane	5	ND (100)	ND (500)	ND (2500)	ND (2000)	ND (1200)	ND (1000)	ND (10)	ND (1000)
Ethyl Benzene	700	ND (100)	ND (500)	ND (2500)	ND (2000)	ND (1200)	ND (1000)	7 J (10)	ND (1000)
Methyl tert-butyl ether	20	ND (200)	ND (1000)	ND (5000)	ND (4000)	ND (2500)	ND (2000)	ND (20)	ND (2000)
Toluene	1000	**25000 (150)**	**23000 (750)**	**65000 (3800)**	**110000 (3000)**	**100000 (1900)**	**82000 (1500)**	**2400 (15)**	**18000 (1500)**
1,2,4-Trimethylbenzene	530	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	530	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	10000	ND (200)	ND (1000)	ND (5000)	ND (4000)	ND (2500)	ND (2000)	37 J (20)	ND (2000)
Semivolatile Organic Compounds									
Anthracene	66	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	3.9	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.2	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	1.2	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	0.26	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	1.9	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	1900	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	100	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1100	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	130	NA	NA	NA	NA	NA	NA	NA	NA
Metals (Dissolved)									
Lead	5	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations reported in ug/L (ppb); detection limits in parentheses.
2 XQ is an unknown qualifier.
3 Boldfaced concentrations exceed the Non-Res GW Used Aquifer (TDS ≤ 2500) MSC.

Abbreviations:
ND - Not Detected
NA - Not Analyzed
J - Estimated Concentration
B - Analyte found in associated blank.
^c - CCV Recovery is outside acceptance limits.
SL - sample collected from below light non-aqeuous phase liquic

Table 3-5
Groundwater Analytical Results Summary, 2015 to Present
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Location	Non-Res GW	S-484	S-484	S-484	S-484	S-484	S-484	S-485	S-485
Field Sample ID	Used Aquifer	S-484_20240905	S-484_20241008	S-484_20241107	S-484_20241218	S-484_20250203	S-484_20250401	S-485_20230720	S-485_20240603
Sample Date	(TDS ≤ 2500)	9/5/2024	10/8/2024	11/7/2024	12/18/2024	2/3/2025	4/1/2025	7/20/2023	6/3/2024
Hydrostratigraphic Unit	MSC	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer	Unconfined Aquifer
Volatile Organic Compounds									
Benzene	5	**480000 (2500)**	**510000 (2500)**	**280000 (1000)**	**150000 (500)**	**120000 (500)**	**200000 (1000)**	**400 (2.5)**	**32000 (100)**
Cumene	3500	ND (2500)	ND (2500)	ND (1000)	ND (500)	ND (500)	ND (1000)	ND (2.5)	ND (100)
1,2-Dibromoethane	0.05	ND (10000)	ND (10000)	ND (4000)	ND (2000)	ND (2000)	ND (4000)	ND (10)	ND (400)
1,2-Dichloroethane	5	ND (2500)	ND (2500)	ND (1000)	ND (500)	ND (500)	ND (1000)	ND (2.5)	ND (100)
Ethyl Benzene	700	ND (2500)	ND (2500)	ND (1000)	ND (500)	ND (500)	ND (1000)	2.1 J (2.5)	ND (100)
Methyl tert-butyl ether	20	ND (5000)	ND (5000)	ND (2000)	ND (1000)	ND (1000)	ND (2000)	ND (5)	ND (200)
Toluene	1000	**24000 (3800)**	**29000 (3800)**	**19000 (1500)**	**9900 (750)**	**11000 (750)**	**5800 (1500)**	810 (3.8)	**2800 (150)**
1,2,4-Trimethylbenzene	530	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	530	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	10000	ND (5000)	ND (5000)	ND (2000)	ND (1000)	ND (1000)	ND (2000)	11.3 J (5)	ND (200)
Semivolatile Organic Compounds									
Anthracene	66	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	3.9	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.2	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	1.2	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	0.26	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	1.9	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	1900	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	100	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1100	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	130	NA	NA	NA	NA	NA	NA	NA	NA
Metals (Dissolved)									
Lead	5	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations reported in ug/L (ppb); detection limits in parentheses.
2 XQ is an unknown qualifier.
3 Boldfaced concentrations exceed the Non-Res GW Used Aquifer (TDS ≤ 2500) MSC.

Abbreviations:
ND - Not Detected
NA - Not Analyzed
J - Estimated Concentration
B - Analyte found in associated blank.
^c - CCV Recovery is outside acceptance limits.
SL - sample collected from below light non-aqeuous phase liquic

Table 3-5
Groundwater Analytical Results Summary, 2015 to Present
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Bellwether District Holdings, LLC , Philadelphia, PA

Location	Non-Res GW	S-507	S-508	S-508	S-509	S-509	S-69D	S-69D	S-69D
Field Sample ID	Used Aquifer	S-507_20230717	S-508_20230720	S-508_20240905	S-509_20230720	S-509_20240531	AOI3_S-69D_060915	AOI3_S69D_122115	S-69D_20190226
Sample Date	(TDS ≤ 2500)	7/17/2023	7/20/2023	9/5/2024	7/20/2023	5/31/2024	6/9/2015	12/21/2015	2/26/2019
Hydrostratigraphic Unit	MSC	Lower Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer
Volatile Organic Compounds									
Benzene	5	**16 (0.5)**	2.8 (0.5)	ND (0.5)	1 (0.5)	ND (0.5)	**5.1 (1)**	**338 (5)**	ND (1)
Cumene	3500	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (1)	ND (1)	ND (5)
1,2-Dibromoethane	0.05	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	**0.08 (0.04)**	ND (0.018)	ND (1)
1,2-Dichloroethane	5	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (1)	ND (1)	ND (5)
Ethyl Benzene	700	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	0.73 J (1)	ND (1)	ND (1)
Methyl tert-butyl ether	20	2.5 (1)	ND (1)	0.6 J (1)	1.4 (1)	0.92 J (1)	8.8 (1)	1.7 (1)	2 (1)
Toluene	1000	1.9 (0.75)	0.36 J (0.75)	ND (0.75)	ND (0.75)	ND (0.75)	8.1 (1)	163 (1)	ND (1)
1,2,4-Trimethylbenzene	530	NA	NA	NA	NA	NA	1.2 (1)	ND (2)	NA
1,3,5-Trimethylbenzene	530	NA	NA	NA	NA	NA	0.28 J (1)	ND (2)	NA
Xylenes (total)	10000	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	4.2 (3)	ND (1)	ND (5)
Semivolatile Organic Compounds									
Anthracene	66	NA	NA	NA	NA	NA	ND (1)	ND (0.1)	NA
Benzo(a)anthracene	3.9	NA	NA	NA	NA	NA	ND (1)	ND (0.05)	NA
Benzo(a)pyrene	0.2	NA	NA	NA	NA	NA	ND (1)	ND (0.05)	NA
Benzo(b)fluoranthene	1.2	NA	NA	NA	NA	NA	ND (1)	ND (0.1)	NA
Benzo(g,h,i)perylene	0.26	NA	NA	NA	NA	NA	ND (1)	ND (0.1)	NA
Chrysene	1.9	NA	NA	NA	NA	NA	ND (1)	ND (0.1)	NA
Fluorene	1900	NA	NA	NA	NA	NA	ND (1)	ND (0.1)	NA
Naphthalene	100	NA	NA	NA	NA	NA	0.26 J (1)	ND (0.1)	NA
Phenanthrene	1100	NA	NA	NA	NA	NA	ND (1)	ND (0.1)	NA
Pyrene	130	NA	NA	NA	NA	NA	ND (1)	ND (0.1)	NA
Metals (Dissolved)									
Lead	5	NA	NA	NA	NA	NA	ND (5)	ND (3)	NA

Notes:
1 All concentrations reported in ug/L (ppb); detection limits in parentheses.
2 XQ is an unknown qualifier.
3 Boldfaced concentrations exceed the Non-Res GW Used Aquifer (TDS ≤ 2500) MSC.

Abbreviations:
ND - Not Detected
NA - Not Analyzed
J - Estimated Concentration
B - Analyte found in associated blank.
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SL - sample collected from below light non-aqeuous phase liquic

Table 3-5
Groundwater Analytical Results Summary, 2015 to Present
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Location	Non-Res GW	S-69D	S-69D	S-69D	S-69D	S-69D	S-69D
Field Sample ID	Used Aquifer	S-69D_20190626	S-69D_20191029	S-69D_20200901	S-69D_20210426	S-69D_20220405	S-69D_20230426
Sample Date	(TDS ≤ 2500)	6/26/2019	10/29/2019	9/1/2020	4/26/2021	4/5/2022	4/26/2023
Hydrostratigraphic Unit	MSC	Lower Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer	Lower Aquifer
Volatile Organic Compounds							
Benzene	5	ND (1)	ND (1)	ND (1)	0.43 J (1)	ND (0.5)	3.4 (0.5)
Cumene	3500	ND (5)	ND (5)	ND (5)	ND (5)	ND (1)	ND (1)
1,2-Dibromoethane	0.05	ND (0.028)	ND,XQ (0.028)	ND (1)	ND (0.029)	ND (0.02)	ND (0.022)
1,2-Dichloroethane	5	ND (5)	ND (5)	ND (1)	ND (1)	ND (1)	ND (1)
Ethyl Benzene	700	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Methyl tert-butyl ether	20	3 (1)	2 (1)	1.7 (1)	2 (1)	ND (1)	2.6 (1)
Toluene	1000	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,2,4-Trimethylbenzene	530	ND (5)	ND (5)	NA	ND (5)	ND (2)	ND (2)
1,3,5-Trimethylbenzene	530	ND (5)	ND (5)	NA	ND (5)	ND (2)	ND (2)
Xylenes (total)	10000	ND (5)	ND (3)	ND (6)	ND (6)	ND (1)	ND (1)
Semivolatile Organic Compounds							
Anthracene	66	ND (0.5)	ND (0.5)	NA	ND (0.57)	ND (0.08)	0.0875 (0.083)
Benzo(a)anthracene	3.9	ND (0.5)	ND (0.5)	NA	ND (0.57)	ND (0.04)	ND (0.042)
Benzo(a)pyrene	0.2	ND (0.5)	ND (0.5)	NA	ND (0.57)	ND (0.04)	ND (0.042)
Benzo(b)fluoranthene	1.2	ND (0.5)	ND (0.5)	NA	ND (0.57)	ND (0.04)	ND (0.042)
Benzo(g,h,i)perylene	0.26	ND (0.5)	ND (0.5)	NA	ND (0.57)	ND (0.08)	ND (0.083)
Chrysene	1.9	ND (0.5)	ND (0.5)	NA	ND (0.57)	ND (0.08)	ND (0.083)
Fluorene	1900	ND (0.5)	ND (0.5)	NA	ND (0.57)	ND (0.08)	ND (0.083)
Naphthalene	100	ND (0.5)	ND (0.5)	NA	0.32 J (0.57)	ND (0.08)	0.0553 J (0.083)
Phenanthrene	1100	ND (0.5)	ND (0.5)	NA	ND (0.57)	ND (0.08)	0.278 (0.083)
Pyrene	130	ND (0.5)	ND (0.5)	NA	ND (0.57)	ND (0.08)	ND (0.083)
Metals (Dissolved)							
Lead	5	ND (3)	0.09 J (0.5)	NA	ND (0.52)	ND (1)	ND (1)

Notes:
1 All concentrations reported in ug/L (ppb); detection limits in parentheses.
2 XQ is an unknown qualifier.
3 Boldfaced concentrations exceed the Non-Res GW Used Aquifer (TDS ≤ 2500) MSC.

Abbreviations:
ND - Not Detected
NA - Not Analyzed
J - Estimated Concentration
B - Analyte found in associated blank.
^c - CCV Recovery is outside acceptance limits.
SL - sample collected from below light non-aqeuous phase liquic

Table 3-6
Groundwater Analytical Results – Bacterial Biomass
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Sample Location		S-508	BF-103R	S-509	S-438
Sample Date		20-Jul-23	20-Jul-23	20-Jul-23	20-Jul-23
Sample ID		*S-509-20230720	BF-103R-20230720	*S-508-20230720	S-438-20230720
Sample Depth		75.35 ft	18.00 ft	77.50 ft	22.15 ft
Sampling Company		STANTEC	STANTEC	STANTEC	STANTEC
Laboratory		MICROBAC	MICROBAC	MICROBAC	MICROBAC
Laboratory Work Order		Z3FG0106	Z3FG0106	Z3FG0106	Z3G0106
Laboratory Sample ID	Units	Z3FG0106-01	Z3FG0106-04	Z3FG0106-02	Z3G0106-03
QPCR					
Estimated Bacterial Biomass	gc/L	761,000,000	32,500,000,000	413,000,000	25,000,000,000

Notes:
*The sample IDs for groundwater samples collected at S-508 and S-509 were mislabeled in the field and laboratory report.

QPCR	quantitative polymerase chain reaction
gc/L	gene copies per liter
ft	feet

Table 3-7
LNAPL Sampling Results Summary
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC, Philadelphia, PA

Well ID	LNAPL Sample Date	Interpretive and Analytical Laboratory Data				Analytical Laboratory
		LNAPL Type	Composition Ratios (%)	Degree of Weathering	Specific Gravity (gm/ml)	
BF-103R	3/15/2022	Reformate	97.5	-	0.7075	Alpha Analytical, Torkelson
		Light Naphtha	2.5	-		
		Middle Distillate	0.001	-		
		Residual Range	0.0	-		
S-283	3/15/2022	Reformate	94.7	-	0.738	Alpha Analytical, Torkelson
		Light Naphtha	4.9	High		
		Middle Distillate	0.38	High		
		Residual Range	0.0	-		
S-480	3/15/2022	Reformate	27.1	-	NA	Alpha Analytical
		Light Naphtha	48.6	Moderate		
		Middle Distillate	24.2	High		
		Residual Range	0.0	-		
S-414	3/15/2022	Reformate	98	-	0.7289	Alpha Analytical, Torkelson
		Light Naphtha	2	-		
		Middle Distillate	0.002	-		
		Residual Range	0.0	-		
S-382	3/15/2022	Reformate	98.2	-	0.7282	Alpha Analytical, Torkelson
		Light Naphtha	1.8	-		
		Middle Distillate	0.002	-		
		Residual Range	0.0	-		
UDEX-EW-19 CONDENSATE	7/26/2022	Reformate	88.1	-	NA	Alpha Analytical
		Light Naphtha	6.8	-		
		Middle Distillate	3.6	High		
		Residual Range	1.5	-		
S-439	2/14/2020	Reformate	NA	-	NA	PACE
		Light Naphtha	NA	Moderate		
		Middle Distillate	NA	High		
		Residual Range	NA	-		
	4/27/2023	Reformate	85.6	-	NA	Alpha Analytical
		Light Naphtha	9.6	High		
		Middle Distillate	4.78	High		
		Residual Range	0.0	-		

Table 3-8
Soil Analytical Results Summary
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Location Field Sample ID Collection Depth (ft bgs) Sample Date Comments	Non-Res Direct Contact with Surface Soil MSC (0-2 ft)	Non-Res Direct Contact with Subsurface Soil MSC (2-15 ft)	Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC	US EPA Regional Screening Levels for Industrial Soil (TR=1E-06, THQ=0.1)	302-AK02-a 302-AK02-C1-VOC 1.5 - 2.0 10/25/2022	302-AK02-a 302-AK02-C3-VOC 7.5 - 8.0 10/25/2022	302-AK02-a 302-AK02-C4-VOC 10.0 - 10.5 10/25/2022	302-AL02-a 302-AL02-C3-VOC 5.0 - 5.5 11/11/2022	302-AL02-a 302-AL02-C4-VOC 7.0 - 7.5 11/11/2022	302-AL02-c 302-AL02-C1-VOC 0.0 - 0.5 11/11/2022	302-AM01-c 302-AM01-C1-VOC 0.5 - 1.0 10/24/2022	302-AM01-c 302-AM01-C2-VOC 2.0 - 2.5 10/24/2022	302-AM01-c 302-AM01-C3-VOC 3.0 - 3.5 10/24/2022
Volatile Organic Compounds													
Benzene	280	330	0.5	5.1	0.0052 (0.0003)	ND (0.001)	ND (0.00048)	ND (0.00054)	0.00083 (0.00046)	ND (0.00054)	2.8 (0.027)	0.0041 (0.00053)	ND (0.00054)
Cumene	10000	10000	2500	9900	ND (0.0006)	ND (0.0021)	ND (0.00096)	ND (0.0011)	ND (0.00093)	ND (0.0011)	0.0088 J (0.055)	ND (0.001)	ND (0.0011)
1,2-Dibromoethane	3.7	4.2	0.005	0.16	ND (0.0003)	ND (0.001)	ND (0.00048)	ND (0.00054)	ND (0.00046)	ND (0.00054)	ND (0.027)	ND (0.00053)	ND (0.00054)
1,2-Dichloroethane	85	98	0.5	2	ND (0.0006)	ND (0.0021)	ND (0.00096)	ND (0.0011)	ND (0.00093)	ND (0.0011)	ND (0.055)	ND (0.001)	ND (0.0011)
Ethyl Benzene	880	1000	70	25	ND (0.0006)	ND (0.0021)	ND (0.00096)	ND (0.0011)	ND (0.00093)	ND (0.0011)	0.019 J (0.055)	ND (0.001)	ND (0.0011)
Methyl tert-butyl ether	8500	9800	2	210	ND (0.0012)	ND (0.0042)	ND (0.0019)	ND (0.0022)	ND (0.0019)	ND (0.0022)	ND (0.11)	ND (0.0021)	ND (0.0021)
Toluene	10000	10000	100	47000	ND (0.0006)	ND (0.0021)	ND (0.00096)	ND (0.0011)	ND (0.00093)	ND (0.0011)	0.092 (0.055)	ND (0.001)	ND (0.0011)
1,2,4-Trimethylbenzene	4700	5400	300	1800	ND (0.0012)	ND (0.0042)	ND (0.0019)	ND (0.0022)	ND (0.0019)	0.00037 J (0.0022)	0.036 J (0.11)	ND (0.0021)	ND (0.0021)
1,3,5-Trimethylbenzene	4700	5400	93	1500	ND (0.0012)	ND (0.0042)	ND (0.0019)	ND (0.0022)	ND (0.0019)	ND (0.0022)	0.01 J (0.11)	ND (0.0021)	ND (0.0021)
Xylenes (total)	7900	9100	1000	2500	ND (0.0006)	ND (0.0021)	ND (0.00096)	0.00039 J (0.0011)	0.0003 J (0.00093)	0.00038 J (0.0011)	0.15 J (0.055)	ND (0.001)	ND (0.0011)
Extractable Petroleum Hydrocarbons													
>C12 to C22	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
>C22 to C44	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics (C10-C28)	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gasoline Range Organics	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Petroleum Hydrocarbons C9 - C44	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations reported in mg/kg (ppm). Detection limits are in parentheses.
2 Gray-shaded concentrations indicate that either a surface sample exceeds the Non-Res Direct Contact with Surface Soil MSC (0-2 ft) or a subsurface sample exceeds the Non-Res Direct Contact with Subsurface Soil MSC (2-15 ft).
3 Underlined concentrations exceed the Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC.
4 Boldfaced concentrations exceed the US EPA Regional Screening Levels for Industrial Soil (TR=1E-06, THQ=0.1).

Abbreviations:
ND - Not Detected
NA - Not Analyzed
FH - MS and/or MSD recovery above control limits
J - Estimated Concentration
Q8 - Duplicate Relative Percent Difference
ft bgs = feet below ground surface

Table 3-8
Soil Analytical Results Summary
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Location Field Sample ID Collection Depth (ft bgs) Sample Date Comments	Non-Res Direct Contact with Surface Soil MSC (0-2 ft)	Non-Res Direct Contact with Subsurface Soil MSC (2-15 ft)	Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC	US EPA Regional Screening Levels for Industrial Soil (TR=1E-06, THQ=0.1)	302-AM01-c 302-AM01-C4-VOC 4.5 - 5.0 10/24/2022	302-AM02-b 302-AM02-C1-VOC 1.0 - 1.5 10/6/2022	302-AM02-b 302-AM02-C2-VOC 2.0 - 2.5 10/6/2022	302-AM02-b 302-AM02-C3-VOC 5.0 - 5.5 10/6/2022	302-AM02-b 302-AM02-C4-VOC 6.5 - 7.0 10/6/2022	302-AM02-b 302-AM02-C5-VOC 7.5 - 8.0 10/6/2022	302-AN01-c 302-AN01-C1-VOC 0.0 - 0.5 10/6/2022	302-AN01-c 302-AN01-C2-VOC 0.6 - 1.1 10/6/2022	302-AN01-c 302-AN01-C3-VOC 1.1 - 1.6 10/6/2022
Volatile Organic Compounds													
Benzene	280	330	0.5	5.1	0.00023 J (0.00046)	ND (0.0004)	0.00031 J (0.00049)	0.00046 J (0.00057)	0.00069 (0.00056)	0.0004 J (0.00059)	0.0012 (0.00075)	0.037 (0.00051)	1 (0.022)
Cumene	10000	10000	2500	9900	ND (0.00093)	ND (0.00081)	ND (0.00098)	ND (0.0011)	ND (0.0011)	ND (0.0012)	ND (0.0015)	ND (0.001)	0.00029 J (0.00093)
1,2-Dibromoethane	3.7	4.2	0.005	0.16	ND (0.00046)	ND (0.0004)	ND (0.00049)	ND (0.00057)	ND (0.00056)	ND (0.00059)	ND (0.00075)	ND (0.00051)	ND (0.00047)
1,2-Dichloroethane	85	98	0.5	2	ND (0.00093)	ND (0.00081)	ND (0.00098)	ND (0.0011)	ND (0.0011)	ND (0.0012)	ND (0.0015)	ND (0.001)	ND (0.00093)
Ethyl Benzene	880	1000	70	25	ND (0.00093)	ND (0.00081)	ND (0.00098)	ND (0.0011)	ND (0.0011)	ND (0.0012)	ND (0.0015)	ND (0.001)	0.00026 J (0.00093)
Methyl tert-butyl ether	8500	9800	2	210	ND (0.0019)	ND (0.0016)	ND (0.002)	ND (0.0023)	ND (0.0022)	ND (0.0024)	ND (0.003)	ND (0.002)	ND (0.0019)
Toluene	10000	10000	100	47000	ND (0.00093)	ND (0.00081)	ND (0.00098)	ND (0.0011)	ND (0.0011)	ND (0.0012)	ND (0.0015)	0.00056 J (0.001)	0.0012 (0.00093)
1,2,4-Trimethylbenzene	4700	5400	300	1800	ND (0.0019)	ND (0.0016)	0.00035 J (0.002)	ND (0.0023)	ND (0.0022)	ND (0.0024)	ND (0.003)	ND (0.002)	ND (0.0019)
1,3,5-Trimethylbenzene	4700	5400	93	1500	ND (0.0019)	ND (0.0016)	0.00027 J (0.002)	ND (0.0023)	ND (0.0022)	ND (0.0024)	ND (0.003)	ND (0.002)	ND (0.0019)
Xylenes (total)	7900	9100	1000	2500	ND (0.00093)	ND (0.00081)	ND (0.00098)	ND (0.0011)	ND (0.0011)	ND (0.0012)	ND (0.0015)	ND (0.001)	ND (0.00093)
Extractable Petroleum Hydrocarbons													
>C12 to C22	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
>C22 to C44	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics (C10-C28)	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gasoline Range Organics	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Petroleum Hydrocarbons C9 - C44	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
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3 Underlined concentrations exceed the Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC.
4 Boldfaced concentrations exceed the US EPA Regional Screening Levels for Industrial Soil (TR=1E-06, THQ=0.1).

Abbreviations:
ND - Not Detected
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J - Estimated Concentration
Q8 - Duplicate Relative Percent Difference
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Volatile Organic Compounds													
Benzene	280	330	0.5	5.1	3 (0.026)	**7.8 (0.028)**	ND (0.001)	0.0025 (0.00059)	0.05 (0.00046)	ND (0.00053)	ND (0.00051)	ND (0.00053)	ND (0.00046)
Cumene	10000	10000	2500	9900	ND (0.052)	0.034 J (0.055)	ND (0.0021)	ND (0.0012)	0.0001 J (0.00092)	ND (0.0011)	ND (0.001)	ND (0.001)	ND (0.00091)
1,2-Dibromoethane	3.7	4.2	0.005	0.16	ND (0.026)	ND (0.028)	ND (0.001)	ND (0.00059)	ND (0.00046)	ND (0.00053)	ND (0.00051)	ND (0.00053)	ND (0.00046)
1,2-Dichloroethane	85	98	0.5	2	ND (0.052)	ND (0.055)	ND (0.0021)	ND (0.0012)	ND (0.00092)	ND (0.0011)	ND (0.001)	ND (0.001)	ND (0.00091)
Ethyl Benzene	880	1000	70	25	ND (0.052)	0.036 J (0.055)	ND (0.0021)	ND (0.0012)	ND (0.00092)	ND (0.0011)	ND (0.001)	ND (0.001)	ND (0.00091)
Methyl tert-butyl ether	8500	9800	2	210	ND (0.1)	ND (0.11)	ND (0.0042)	ND (0.0024)	ND (0.0018)	ND (0.0021)	ND (0.002)	ND (0.0021)	ND (0.0018)
Toluene	10000	10000	100	47000	ND (0.052)	0.61 (0.055)	ND (0.0021)	ND (0.0012)	0.00062 J (0.00092)	ND (0.0011)	ND (0.001)	ND (0.001)	ND (0.00091)
1,2,4-Trimethylbenzene	4700	5400	300	1800	ND (0.1)	ND (0.11)	ND (0.0042)	ND (0.0024)	ND (0.0018)	ND (0.0021)	ND (0.002)	ND (0.0021)	ND (0.0018)
1,3,5-Trimethylbenzene	4700	5400	93	1500	ND (0.1)	ND (0.11)	ND (0.0042)	ND (0.0024)	ND (0.0018)	ND (0.0021)	ND (0.002)	ND (0.0021)	ND (0.0018)
Xylenes (total)	7900	9100	1000	2500	ND (0.052)	0.031 J (0.055)	ND (0.0021)	ND (0.0012)	ND (0.00092)	ND (0.0011)	ND (0.001)	ND (0.001)	ND (0.00091)
Extractable Petroleum Hydrocarbons													
>C12 to C22	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
>C22 to C44	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics (C10-C28)	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gasoline Range Organics	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Petroleum Hydrocarbons C9 - C44	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
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3 Underlined concentrations exceed the Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC.
4 Boldfaced concentrations exceed the US EPA Regional Screening Levels for Industrial Soil (TR=1E-06, THQ=0.1).

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Volatile Organic Compounds													
Benzene	280	330	0.5	5.1	ND (0.00075)	ND (0.00056)	ND (0.00047)	ND (0.00064)	0.0018 (0.001)	ND (0.00059)	ND (0.00049)	ND (0.00045)	ND (0.00086)
Cumene	10000	10000	2500	9900	ND (0.0015)	0.00025 J (0.0011)	ND (0.00094)	ND (0.0013)	ND (0.0021)	ND (0.0012)	ND (0.00097)	ND (0.00091)	ND (0.0017)
1,2-Dibromoethane	3.7	4.2	0.005	0.16	ND (0.00075)	ND (0.00056)	ND (0.00047)	ND (0.00064)	ND (0.001)	ND (0.00059)	ND (0.00049)	ND (0.00045)	ND (0.00086)
1,2-Dichloroethane	85	98	0.5	2	ND (0.0015)	ND (0.0011)	ND (0.00094)	ND (0.0013)	ND (0.0021)	ND (0.0012)	ND (0.00097)	ND (0.00091)	ND (0.0017)
Ethyl Benzene	880	1000	70	25	ND (0.0015)	ND (0.0011)	ND (0.00094)	ND (0.0013)	ND (0.0021)	ND (0.0012)	ND (0.00097)	ND (0.00091)	ND (0.0017)
Methyl tert-butyl ether	8500	9800	2	210	0.00037 J (0.003)	ND (0.0022)	ND (0.0019)	ND (0.0025)	ND (0.0042)	ND (0.0024)	ND (0.0019)	ND (0.0018)	ND (0.0035)
Toluene	10000	10000	100	47000	ND (0.0015)	0.0011 (0.0011)	ND (0.00094)	ND (0.0013)	ND (0.0021)	ND (0.0012)	ND (0.00097)	ND (0.00091)	ND (0.0017)
1,2,4-Trimethylbenzene	4700	5400	300	1800	ND (0.003)	0.00053 J (0.0022)	ND (0.0019)	ND (0.0025)	ND (0.0042)	ND (0.0024)	ND (0.0019)	ND (0.0018)	ND (0.0035)
1,3,5-Trimethylbenzene	4700	5400	93	1500	ND (0.003)	0.00045 J (0.0022)	ND (0.0019)	ND (0.0025)	ND (0.0042)	ND (0.0024)	ND (0.0019)	ND (0.0018)	ND (0.0035)
Xylenes (total)	7900	9100	1000	2500	ND (0.0015)	ND (0.0011)	ND (0.00094)	ND (0.0013)	ND (0.0021)	ND (0.0012)	ND (0.00097)	ND (0.00091)	ND (0.0017)
Extractable Petroleum Hydrocarbons													
>C12 to C22	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
>C22 to C44	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics (C10-C28)	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gasoline Range Organics	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Petroleum Hydrocarbons C9 - C44	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
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3 Underlined concentrations exceed the Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC.
4 Boldfaced concentrations exceed the US EPA Regional Screening Levels for Industrial Soil (TR=1E-06, THQ=0.1).

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Volatile Organic Compounds												
Benzene	280	330	0.5	5.1	ND (0.00053)	ND (0.00055)	ND (0.00046)	ND (0.00044)	0.00081 (0.00064)	0.0023 (0.00076)	NA	NA
Cumene	10000	10000	2500	9900	ND (0.001)	ND (0.0011)	ND (0.00092)	ND (0.00088)	0.0022 (0.0013)	0.013 (0.0015)	NA	NA
1,2-Dibromoethane	3.7	4.2	0.005	0.16	ND (0.00053)	ND (0.00055)	ND (0.00046)	ND (0.00044)	ND (0.00064)	ND (0.00076)	NA	NA
1,2-Dichloroethane	85	98	0.5	2	ND (0.001)	ND (0.0011)	ND (0.00092)	ND (0.00088)	ND (0.0013)	ND (0.0015)	NA	NA
Ethyl Benzene	880	1000	70	25	ND (0.001)	ND (0.0011)	ND (0.00092)	ND (0.00088)	0.00059 J (0.0013)	0.0012 J (0.0015)	NA	NA
Methyl tert-butyl ether	8500	9800	2	210	ND (0.0021)	ND (0.0022)	ND (0.0018)	ND (0.0018)	ND (0.0025)	ND (0.003)	NA	NA
Toluene	10000	10000	100	47000	ND (0.001)	ND (0.0011)	ND (0.00092)	ND (0.00088)	0.0017 (0.0013)	0.0028 (0.0015)	NA	NA
1,2,4-Trimethylbenzene	4700	5400	300	1800	ND (0.0021)	ND (0.0022)	ND (0.0018)	ND (0.0018)	0.0084 (0.0025)	0.0028 J (0.003)	NA	NA
1,3,5-Trimethylbenzene	4700	5400	93	1500	ND (0.0021)	ND (0.0022)	ND (0.0018)	ND (0.0018)	0.011 (0.0025)	0.0035 (0.003)	NA	NA
Xylenes (total)	7900	9100	1000	2500	ND (0.001)	ND (0.0011)	ND (0.00092)	ND (0.00088)	0.038 (0.0013)	0.018 (0.0015)	NA	NA
Extractable Petroleum Hydrocarbons												
>C12 to C22	--	--	--	--	NA	NA	NA	NA	NA	NA	4200 (130)	3900 (130)
>C22 to C44	--	--	--	--	NA	NA	NA	NA	NA	NA	140 (130)	120 J (130)
Diesel Range Organics (C10-C28)	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA
Gasoline Range Organics	--	--	--	--	NA	NA	NA	NA	NA	NA	19000 (2300)	22000 (2700)
Petroleum Hydrocarbons C9 - C44	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA

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Volatile Organic Compounds													
Benzene	280	330	0.5	5.1	NA	ND (0.001)	4.6 (0.17)	2.9 (0.094)	ND (0.018)	0.004 J (0.0004)	0.25 (0.017)	0.007 (0.0004)	0.077 (0.0004)
Cumene	10000	10000	2500	9900	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	3.7	4.2	0.005	0.16	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	85	98	0.5	2	NA	ND (0.001)	NA	NA	NA	NA	NA	NA	NA
Ethyl Benzene	880	1000	70	25	NA	ND (0.001)	19 (0.17)	6.3 (0.094)	ND (0.018)	0.011 (0.0004)	0.84 (0.017)	0.014 (0.0004)	0.24 (0.0004)
Methyl tert-butyl ether	8500	9800	2	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	10000	10000	100	47000	NA	ND (0.001)	ND (0.13)	ND (0.07)	ND (0.014)	0.0007 J (0.0003)	ND (0.013)	0.0006 J (0.0003)	0.001 J (0.0003)
1,2,4-Trimethylbenzene	4700	5400	300	1800	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	4700	5400	93	1500	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	7900	9100	1000	2500	NA	NA	50 (0.39)	10 (0.21)	ND (0.041)	0.026 (0.0008)	1.8 (0.038)	0.033 (0.0008)	0.6 (0.0009)
Extractable Petroleum Hydrocarbons													
>C12 to C22	--	--	--	--	11000 (350)	NA	NA	NA	NA	NA	NA	NA	NA
>C22 to C44	--	--	--	--	300 J (350)	NA	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics (C10-C28)	--	--	--	--	NA	NA	9100 (120)	5400 (89)	150 (4.6)	340 (4.7)	19 (4.6)	24 (4.6)	600 Q8 (8.9)
Gasoline Range Organics	--	--	--	--	4200 (500)	NA	4100 (420)	4100 (400)	2000 (160)	1200 (170)	310 (4.2)	23 (0.8)	5.3 (0.2)
Petroleum Hydrocarbons C9 - C44	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Location Field Sample ID Collection Depth (ft bgs) Sample Date Comments	Non-Res Direct Contact with Surface Soil MSC (0-2 ft)	Non-Res Direct Contact with Subsurface Soil MSC (2-15 ft)	Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC	US EPA Regional Screening Levels for Industrial Soil (TR=1E-06, THQ=0.1)	S-429 S-429 (10-11.25) 10.0 - 11.3 9/19/2018	S-429 S-429 (12-13.25) 12.0 - 13.3 9/19/2018	S-429 S-429 (14-15.25) 14.0 - 15.3 9/19/2018	S-429 S-429 (16-17.25) 16.0 - 17.3 9/19/2018	S-429 S-429 (18-19.15) 18.0 - 19.2 9/19/2018	S-429 S-429 (20-21) 20.0 - 21.0 9/19/2018	S-429 S-429 (22-23.25) 22.0 - 23.3 9/19/2018	S-429 S-429 (24-25.5) 24.0 - 25.5 9/19/2018	S-429 S-429 (26-27.5) 26.0 - 27.5 9/19/2018
Volatile Organic Compounds													
Benzene	280	330	0.5	5.1	**14 (0.019)**	**6.4 (0.018)**	3.8 (0.022)	**120 (0.19)**	**1300 (3.5)**	**160 (0.36)**	**38 (0.43)**	**14 (0.021)**	**20 (0.037)**
Cumene	10000	10000	2500	9900	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	3.7	4.2	0.005	0.16	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	85	98	0.5	2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl Benzene	880	1000	70	25	ND (0.0004)	ND (0.0004)	ND (0.0004)	ND (0.19)	ND (0.7)	ND (0.09)	ND (0.043)	ND (0.021)	ND (0.019)
Methyl tert-butyl ether	8500	9800	2	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	10000	10000	100	47000	0.001 J (0.0003)	0.024 (0.0003)	0.19 (0.0003)	180 (1.4)	790 (2.6)	21 (0.067)	0.75 (0.032)	2.8 (0.016)	10 (0.014)
1,2,4-Trimethylbenzene	4700	5400	300	1800	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	4700	5400	93	1500	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	7900	9100	1000	2500	ND (0.0009)	ND (0.001)	ND (0.0009)	ND (0.43)	ND (1.6)	ND (0.2)	ND (0.096)	ND (0.047)	ND (0.042)
Extractable Petroleum Hydrocarbons													
>C12 to C22	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
>C22 to C44	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics (C10-C28)	--	--	--	--	ND (4.4)	ND (4.3)	ND (4.3)	ND (4.3)	ND (4.3)	ND (4.5)	ND (4.8)	ND (4.6)	ND (4.9)
Gasoline Range Organics	--	--	--	--	0.4 J (0.2)	ND (0.2)	0.3 J (0.2)	ND (0.2)	3100 (160)	190 (4.2)	20 (0.9)	35 (1.6)	28 (0.9)
Petroleum Hydrocarbons C9 - C44	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations reported in mg/kg (ppm). Detection limits are in parentheses.
2 Gray-shaded concentrations indicate that either a surface sample exceeds the Non-Res Direct Contact with Surface Soil MSC (0-2 ft) or a subsurface sample exceeds the Non-Res Direct Contact with Subsurface Soil MSC (2-15 ft).
3 Underlined concentrations exceed the Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC.
4 Boldfaced concentrations exceed the US EPA Regional Screening Levels for Industrial Soil (TR=1E-06, THQ=0.1).

Abbreviations:
ND - Not Detected
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FH - MS and/or MSD recovery above control limits
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Q8 - Duplicate Relative Percent Difference
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Table 3-8
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Location Field Sample ID Collection Depth (ft bgs) Sample Date Comments	Non-Res Direct Contact with Surface Soil MSC (0-2 ft)	Non-Res Direct Contact with Subsurface Soil MSC (2-15 ft)	Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC	US EPA Regional Screening Levels for Industrial Soil (TR=1E-06, THQ=0.1)	S-479 UDEX-CD-01-14-20211221_410-67745-1 14 12/21/2021	S-479 UDEX-CD-01-15-20211221_410-67745-1 15 12/21/2021	S-479 UDEX-CD-01-16-20211221_410-67745-1 16 12/21/2021	S-479 UDEX-CD-01-17-20211221_410-67745-1 17 12/21/2021	S-479 UDEX-CD-01-18-20211221_410-67745-1 18 12/21/2021	S-480 UDEX-CD-03-17_20211216_410-67208-1 17 12/16/2021
Volatile Organic Compounds										
Benzene	280	330	0.5	5.1	NA	NA	NA	NA	NA	NA
Cumene	10000	10000	2500	9900	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	3.7	4.2	0.005	0.16	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	85	98	0.5	2	NA	NA	NA	NA	NA	NA
Ethyl Benzene	880	1000	70	25	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	8500	9800	2	210	NA	NA	NA	NA	NA	NA
Toluene	10000	10000	100	47000	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	4700	5400	300	1800	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	4700	5400	93	1500	NA	NA	NA	NA	NA	NA
Xylenes (total)	7900	9100	1000	2500	NA	NA	NA	NA	NA	NA
Extractable Petroleum Hydrocarbons										
>C12 to C22	--	--	--	--	34 (13)	ND (13)	180 (13)	ND (14)	ND (15)	3200 (130)
>C22 to C44	--	--	--	--	ND (13)	7.8 J (13)	110 (13)	ND (14)	ND (15)	180 (130)
Diesel Range Organics (C10-C28)	--	--	--	--	NA	NA	NA	NA	NA	NA
Gasoline Range Organics	--	--	--	--	1.1 J (1.4)	3400 (490)	2000 (430)	43 (5.1)	0.66 J (1.4)	73 (41)
Petroleum Hydrocarbons C9 - C44	--	--	--	--	NA	NA	NA	NA	NA	NA

Notes:
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2 Gray-shaded concentrations indicate that either a surface sample exceeds the Non-Res Direct Contact with Surface Soil MSC (0-2 ft) or a subsurface sample exceeds the Non-Res Direct Contact with Subsurface Soil MSC (2-15 ft).
3 Underlined concentrations exceed the Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC.
4 Boldfaced concentrations exceed the US EPA Regional Screening Levels for Industrial Soil (TR=1E-06, THQ=0.1).

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Volatile Organic Compounds										
Benzene	280	330	0.5	5.1	NA	NA	NA	NA	NA	NA
Cumene	10000	10000	2500	9900	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	3.7	4.2	0.005	0.16	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	85	98	0.5	2	NA	NA	NA	NA	NA	NA
Ethyl Benzene	880	1000	70	25	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	8500	9800	2	210	NA	NA	NA	NA	NA	NA
Toluene	10000	10000	100	47000	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	4700	5400	300	1800	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	4700	5400	93	1500	NA	NA	NA	NA	NA	NA
Xylenes (total)	7900	9100	1000	2500	NA	NA	NA	NA	NA	NA
Extractable Petroleum Hydrocarbons										
>C12 to C22	--	--	--	--	18000 (670)	19 (13)	6.5 J (14)	ND (13)	ND (14)	ND (13)
>C22 to C44	--	--	--	--	880 (670)	12 J (13)	5.9 J (14)	ND (13)	ND (14)	ND (13)
Diesel Range Organics (C10-C28)	--	--	--	--	NA	NA	NA	NA	NA	NA
Gasoline Range Organics	--	--	--	--	8400 (510)	1.5 (1.2)	400 (44)	3600 (250)	6900 (1100)	ND (1.3)
Petroleum Hydrocarbons C9 - C44	--	--	--	--	NA	NA	NA	NA	NA	NA

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3 Underlined concentrations exceed the Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC.
4 Boldfaced concentrations exceed the US EPA Regional Screening Levels for Industrial Soil (TR=1E-06, THQ=0.1).

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Volatile Organic Compounds										
Benzene	280	330	0.5	5.1	NA	NA	NA	NA	NA	NA
Cumene	10000	10000	2500	9900	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	3.7	4.2	0.005	0.16	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	85	98	0.5	2	NA	NA	NA	NA	NA	NA
Ethyl Benzene	880	1000	70	25	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	8500	9800	2	210	NA	NA	NA	NA	NA	NA
Toluene	10000	10000	100	47000	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	4700	5400	300	1800	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	4700	5400	93	1500	NA	NA	NA	NA	NA	NA
Xylenes (total)	7900	9100	1000	2500	NA	NA	NA	NA	NA	NA
Extractable Petroleum Hydrocarbons										
>C12 to C22	--	--	--	--	ND (13)	ND (13)	34 (13)	ND (13)	45 (12)	ND (13)
>C22 to C44	--	--	--	--	ND (13)	ND (13)	34 (13)	ND (13)	6.2 J (12)	ND (13)
Diesel Range Organics (C10-C28)	--	--	--	--	NA	NA	NA	NA	NA	NA
Gasoline Range Organics	--	--	--	--	0.78 J (1.2)	1.8 (1.2)	600 (50)	54 (12)	0.76 J (1.2)	0.42 J (1.3)
Petroleum Hydrocarbons C9 - C44	--	--	--	--	NA	NA	NA	NA	NA	NA

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Volatile Organic Compounds											
Benzene	280	330	0.5	5.1	**<u>73 (2.2)</u>**	NA	NA	NA	0.011 (0.00051)	0.0021 (0.00042)	NA
Cumene	10000	10000	2500	9900	ND (0.22)	NA	NA	NA	ND (0.001)	ND (0.00084)	NA
1,2-Dibromoethane	3.7	4.2	0.005	0.16	ND (0.11)	NA	NA	NA	ND (0.00051)	ND (0.00042)	NA
1,2-Dichloroethane	85	98	0.5	2	ND (0.22)	NA	NA	NA	ND (0.001)	ND (0.00084)	NA
Ethyl Benzene	880	1000	70	25	0.4 (0.22)	NA	NA	NA	ND (0.001)	ND (0.00084)	NA
Methyl tert-butyl ether	8500	9800	2	210	ND (0.43)	NA	NA	NA	ND (0.002)	ND (0.0017)	NA
Toluene	10000	10000	100	47000	<u>110 (4.3)</u>	NA	NA	NA	0.0039 (0.001)	0.0019 (0.00084)	NA
1,2,4-Trimethylbenzene	4700	5400	300	1800	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	4700	5400	93	1500	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	7900	9100	1000	2500	1.3 J (0.22)	NA	NA	NA	ND (0.001)	ND (0.00084)	NA
Extractable Petroleum Hydrocarbons											
>C12 to C22	--	--	--	--	NA	ND (12)	ND (13)	ND (13)	NA	NA	NA
>C22 to C44	--	--	--	--	NA	ND (12)	ND (13)	ND (13)	NA	NA	NA
Diesel Range Organics (C10-C28)	--	--	--	--	NA	NA	NA	NA	NA	NA	ND (13)
Gasoline Range Organics	--	--	--	--	520 (38)	0.22 J (1.1)	2600 (510)	11000 (490)	0.66 J (2.3)	0.59 J (2.1)	3.1 (0.91)
Petroleum Hydrocarbons C9 - C44	--	--	--	--	158 (35.8)	NA	NA	NA	7.15 J (33.6)	5.55 J (34.8)	NA

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4 Boldfaced concentrations exceed the US EPA Regional Screening Levels for Industrial Soil (TR=1E-06, THQ=0.1).

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Volatile Organic Compounds													
Benzene	280	330	0.5	5.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cumene	10000	10000	2500	9900	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	3.7	4.2	0.005	0.16	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	85	98	0.5	2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl Benzene	880	1000	70	25	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	8500	9800	2	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	10000	10000	100	47000	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	4700	5400	300	1800	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	4700	5400	93	1500	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	7900	9100	1000	2500	NA	NA	NA	NA	NA	NA	NA	NA	NA
Extractable Petroleum Hydrocarbons													
>C12 to C22	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
>C22 to C44	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics (C10-C28)	--	--	--	--	7.7 J (13)	5.7 J (13)	ND (13)	ND (19)	ND (14)	ND (13)	ND (14)	NDFH (13)	ND (13)
Gasoline Range Organics	--	--	--	--	100 (19)	11000 (830)	5200 (410)	5800 (480)	410 (21)	24 (1.2)	50 (5.4)	25 (3.9)	52 (4)
Petroleum Hydrocarbons C9 - C44	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
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Volatile Organic Compounds													
Benzene	280	330	0.5	5.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cumene	10000	10000	2500	9900	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	3.7	4.2	0.005	0.16	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	85	98	0.5	2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl Benzene	880	1000	70	25	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	8500	9800	2	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	10000	10000	100	47000	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	4700	5400	300	1800	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	4700	5400	93	1500	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	7900	9100	1000	2500	NA	NA	NA	NA	NA	NA	NA	NA	NA
Extractable Petroleum Hydrocarbons													
>C12 to C22	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
>C22 to C44	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics (C10-C28)	--	--	--	--	39 (13)	1500 (68)	2200 (66)	3900 (130)	15000 (350)	ND (13)	ND (12)	29 (13)	8.3 J (14)
Gasoline Range Organics	--	--	--	--	74 (3.8)	12000 (870)	7600 (450)	19000 (2100)	6300 (480)	0.81 J (1.1)	0.39 J (1.1)	49000 (4800)	4800 (210)
Petroleum Hydrocarbons C9 - C44	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations reported in mg/kg (ppm). Detection limits are in parentheses.
2 Gray-shaded concentrations indicate that either a surface sample exceeds the Non-Res Direct Contact with Surface Soil MSC (0-2 ft) or a subsurface sample exceeds the Non-Res Direct Contact with Subsurface Soil MSC (2-15 ft).
3 Underlined concentrations exceed the Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC.
4 Boldfaced concentrations exceed the US EPA Regional Screening Levels for Industrial Soil (TR=1E-06, THQ=0.1).

Abbreviations:
ND - Not Detected
NA - Not Analyzed
FH - MS and/or MSD recovery above control limits
J - Estimated Concentration
Q8 - Duplicate Relative Percent Difference
ft bgs = feet below ground surface

Table 3-8
Soil Analytical Results Summary
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Location Field Sample ID Collection Depth (ft bgs) Sample Date Comments	Non-Res Direct Contact with Surface Soil MSC (0-2 ft)	Non-Res Direct Contact with Subsurface Soil MSC (2-15 ft)	Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC	US EPA Regional Screening Levels for Industrial Soil (TR=1E-06, THQ=0.1)	UDEX-VP-2A UDEX-VP-2A-17-20210224 17 2/24/2021	UDEX-VP-3A UDEX-VP-3A-17-20210224 17 2/24/2021	UDEX-VP-3A UDEX-VP-3A-18-20210224 18 2/24/2021	UDEX-VP-3A UDEX-VP-3A-19-20210224 19 2/24/2021	UDEX-VP-3A UDEX-VP-3A-20-20210224 20 2/24/2021	UDEX-VP-3C UDEX-VP-3C-18-20210224 18 2/24/2021	UDEX-VP-3C UDEX-VP-3C-19-20210224 19 2/24/2021	UDEX-VP-3C UDEX-VP-3C-20-20210224 20 2/24/2021	UDEX-VP-3C UDEX-VP-3C-21-20210224 21 2/24/2021
Volatile Organic Compounds													
Benzene	280	330	0.5	5.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cumene	10000	10000	2500	9900	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	3.7	4.2	0.005	0.16	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	85	98	0.5	2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl Benzene	880	1000	70	25	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	8500	9800	2	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	10000	10000	100	47000	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	4700	5400	300	1800	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	4700	5400	93	1500	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	7900	9100	1000	2500	NA	NA	NA	NA	NA	NA	NA	NA	NA
Extractable Petroleum Hydrocarbons													
>C12 to C22	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
>C22 to C44	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics (C10-C28)	--	--	--	--	6.1 J (13)	ND (13)	ND (13)	ND (13)	ND (14)	ND (13)	ND (13)	10 J (13)	ND (13)
Gasoline Range Organics	--	--	--	--	18000 (2300)	11000 (1000)	14000 (880)	7400 (880)	110 (4.7)	6.9 (1.2)	460 (77)	460 (45)	1.3 (1)
Petroleum Hydrocarbons C9 - C44	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 All concentrations reported in mg/kg (ppm). Detection limits are in parentheses.
2 Gray-shaded concentrations indicate that either a surface sample exceeds the Non-Res Direct Contact with Surface Soil MSC (0-2 ft) or a subsurface sample exceeds the Non-Res Direct Contact with Subsurface Soil MSC (2-15 ft).
3 Underlined concentrations exceed the Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC.
4 Boldfaced concentrations exceed the US EPA Regional Screening Levels for Industrial Soil (TR=1E-06, THQ=0.1).

Abbreviations:
ND - Not Detected
NA - Not Analyzed
FH - MS and/or MSD recovery above control limits
J - Estimated Concentration
Q8 - Duplicate Relative Percent Difference
ft bgs = feet below ground surface

Table 3-8
Soil Analytical Results Summary
UDEX Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Location Field Sample ID Collection Depth (ft bgs) Sample Date Comments	Non-Res Direct Contact with Surface Soil MSC (0-2 ft)	Non-Res Direct Contact with Subsurface Soil MSC (2-15 ft)	Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC	US EPA Regional Screening Levels for Industrial Soil (TR=1E-06, THQ=0.1)	UDEX-VP-3C UDEX-VP-3C-22-20210224 22 2/24/2021	UDEX-VP-3C UDEX-VP-3C-23-20210224 23 2/24/2021
Volatile Organic Compounds						
Benzene	280	330	0.5	5.1	NA	NA
Cumene	10000	10000	2500	9900	NA	NA
1,2-Dibromoethane	3.7	4.2	0.005	0.16	NA	NA
1,2-Dichloroethane	85	98	0.5	2	NA	NA
Ethyl Benzene	880	1000	70	25	NA	NA
Methyl tert-butyl ether	8500	9800	2	210	NA	NA
Toluene	10000	10000	100	47000	NA	NA
1,2,4-Trimethylbenzene	4700	5400	300	1800	NA	NA
1,3,5-Trimethylbenzene	4700	5400	93	1500	NA	NA
Xylenes (total)	7900	9100	1000	2500	NA	NA
Extractable Petroleum Hydrocarbons						
>C12 to C22	--	--	--	--	NA	NA
>C22 to C44	--	--	--	--	NA	NA
Diesel Range Organics (C10-C28)	--	--	--	--	ND (13)	ND (13)
Gasoline Range Organics	--	--	--	--	3.1 (1.1)	66 (4.2)
Petroleum Hydrocarbons C9 - C44	--	--	--	--	NA	NA

Notes:
1 All concentrations reported in mg/kg (ppm). Detection limits are in parentheses.
2 Gray-shaded concentrations indicate that either a surface sample exceeds the Non-Res Direct Contact with Surface Soil MSC (0-2 ft) or a subsurface sample exceeds the Non-Res Direct Contact with Subsurface Soil MSC (2-15 ft).
3 Underlined concentrations exceed the Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC.
4 Boldfaced concentrations exceed the US EPA Regional Screening Levels for Industrial Soil (TR=1E-06, THQ=0.1).

Abbreviations:
ND - Not Detected
NA - Not Analyzed
FH - MS and/or MSD recovery above control limits
J - Estimated Concentration
Q8 - Duplicate Relative Percent Difference
ft bgs = feet below ground surface

Table 3-9
Natural Source Zone Depletion Rates
UDEX Underground Line Release Remedial Investigation Report
Former Philadelphia Refinery

Sample Location	E-Flux Sample ID	Date Deployed	Date Collected	Natural Source Zone Depletion (NSZD) Rate (gal/ac yr)
S-439	10193-R3-CO2-01	10/16/2023	10/20/2023	ND (51)
S-414	10193-R3-CO2-02	10/16/2023	10/20/2023	131
	10193-R3-CO2-03	11/14/2023	11/20/2023	192
S-438	10193-R3-CO2-04	11/14/2023	11/20/2023	138
BF-103R	10193-R3-CO2-05	11/14/2023	11/20/2023	81
			Average NSZD Rate (gal/ac yr)	**136**

Notes:

NSZD = natural source zone depletion

gal/ac yr = gallons per acre per year

ND = not detected

Table 9-1
Summary of Validation Data Set
UDEX Feed Undergound Line Release Remedial Investigation Report
Bellwether District Holdings, LLC, Philadelphia, PA

Well ID	Easting	Northing	Top of Screen Elevation (ft bgs)	Bottom of Screen Elevation (ft bgs)	Midpoint of Screen Elevation (ft bgs)	Hydrostratigraphic Unit	Count	Model Layer	Average Groundwater Elevation (ft amsl)	25th Percentile (ft amsl)	75th Percentile (ft amsl)	Simulated Groundwater Elevation (ft amsl)	Residual (ft)
BF-103R	2682490.90	219959.25	8.43	-1.57	3.43	unconfined	264	1	0.51	0.11	0.90	0.78	-0.27
S-283	2682503.33	220303.50	2.48	-12.52	-5.02	unconfined	215	1	0.35	-0.04	0.64	0.63	-0.28
S-382	2682249.73	220407.56	7.32	-7.68	-0.18	unconfined	271	1	3.33	2.84	3.72	0.61	2.72
S-414	2682403.30	220563.80	10.01	-9.99	0.01	unconfined	348	1	0.68	0.27	1.04	0.57	0.11
S-428	2682724.29	220249.99	3.6	-11.4	-3.9	unconfined	71	1	0.53	0.06	1.00	0.63	-0.10
S-429	2682257.50	220522.46	2.4	-7.6	-2.6	unconfined	139	1	0.72	0.12	1.24	0.61	0.11
S-430	2682288.19	220761.26	2.9	-7.1	-2.1	unconfined	312	1	1.01	0.59	1.40	1.22	-0.21
S-431	2682232.30	220624.48	6	-4	1	unconfined	349	1	1.09	0.56	1.39	1.07	0.02
S-432	2682255.97	220519.32	4.7	-5.3	-0.3	unconfined	137	1	0.79	0.12	1.24	0.61	0.18
S-433	2682191.60	220032.50	-0.8	-10.8	-5.8	unconfined	117	1	0.58	0.00	0.97	0.69	-0.11
S-434	2682610.40	219597.30	0.9	-9.1	-4.1	unconfined	103	1	0.79	0.12	1.21	1.12	-0.33
S-435	2682591.30	219886.20	3.2	-9.8	-3.3	unconfined	118	1	-0.09	-0.60	0.33	0.85	-0.94
S-436	2682814.20	219691.00	1.7	-8.3	-3.3	unconfined	57	1	0.34	0.01	0.69	1.04	-0.70
S-437	2682424.90	220471.30	5.5	-8.5	-1.5	unconfined	199	1	0.60	0.11	0.97	0.59	0.01
S-438	2682239.70	220484.20	4.2	-5.8	-0.8	unconfined	211	1	0.74	0.25	1.15	0.61	0.13
S-439	2682531.30	220606.90	5	-10	-2.5	unconfined	201	1	-0.56	-1.04	-0.19	0.50	-1.06
S-479	2682150.12	220478.56	3.8	-6.2	-1.2	unconfined	136	1	0.72	0.02	1.16	0.59	0.13
S-480	2682726.49	220561.29	2.9	-7.1	-2.1	unconfined	120	1	0.49	-0.05	0.90	0.48	0.01
S-481	2682196.48	220288.23	3.8	-6.2	-1.2	unconfined	124	1	0.63	-0.01	0.95	0.61	0.02
S-482	2682301.59	220639.77	7.8	-2.2	2.8	unconfined	143	1	0.92	0.25	1.41	1.08	-0.16
S-483	2682454.88	219858.61	2.8	-7.2	-2.2	unconfined	94	1	0.57	0.08	0.95	0.85	-0.28
S-484	2682317.25	220459.31	4	-6	-1	unconfined	135	1	0.63	0.00	1.06	0.61	0.02
S-485	2682447.50	220159.90	1.8	-8.2	-3.2	unconfined	98	1	0.67	0.04	1.07	0.68	-0.01
S-507	2682402.69	219984.48	-41.31	-56.31	-48.81	lower aquifer	1	5	0.21	NA	NA	0.26	-0.05
S-508	2682317.72	220466.02	-54.83	-69.83	-62.33	lower aquifer	52	7	0.37	-0.23	0.85	0.27	0.10
S-509	2682556.22	220181.80	-55.76	-70.76	-63.26	lower aquifer	20	7	1.16	0.88	1.38	0.27	0.89

Notes:
ft = feet
bgs = below ground surface
amsl = above mean sea level
Coordinate pairs are projected in the Pennsylvania State Plane Coordinate System (feet), referenced to the North American Vertical Datum of 1988 (NAVD88).

Table 9-2
Summary of Fate and Transport Parameters
UDEX Feed Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC, Philadelphia, PA

COC	Organic Carbon Partitioning Coefficient (k_{oc})	Solubility	Degradation Half Life	Non-Res GW Used Aquifer (TDS<=2500) MSC	Longitudinal Dispersivity		Bulk Density
	L/kg	(mg/L)	days	(ug/L)	Zone 1 (feet)	Zone 2 (feet)	kg/L
Benzene	58	1780.5	722.7	5	42.5	18	1.78
Toluene	130	532.4	28.1	1000			

Notes:
COC = constituent of concern
ug = micrograms; mg = milligrams; kg = kilograms; L = liter
Referenced groundwater (GW) standard is the PADEP Medium Specific Concentration (MSC) for non-residential properties overlying used aquifers with total dissolved solids less than or equal to 2,500 ug/L (the Statewide Health Standard)

Table 9-3
Initial Concentration Data Summary, 2019 to Present
UDEX Feed Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Sample Location	AOI	Hydrostratigraphic Unit	Model Layer Data	Maximum Concentration in Groundwater (µg/L)			
				Benzene	Date	Toluene	Date
BF-103R	AOI 3	Unconfined	1	***2,700***	6/3/2024	***890***	6/3/2024
BF-106	AOI 3	Unconfined	1	***91***	2/27/2019	***22***	2/27/2019
BF-99	AOI 3	Unconfined	1	***100***	2/27/2019	***46***	2/27/2019
C-174	AOI 7	Unconfined	1	1	2/26/2019	1	2/26/2019
S-280	AOI 3	Unconfined	1	***52,000***	6/26/2019	***410***	9/2/2020
S-283	AOI 3	Unconfined	1	***160,000***	5/31/2024	***71,000***	5/31/2024
S-284	AOI 3	Unconfined	1	1	2/27/2019	1	2/27/2019
S-382	AOI 3	Unconfined	1	***170,000***	9/6/2024	***51,000***	11/7/2024
S-383	AOI 3	Unconfined	1	1	2/27/2019	***0.59***	9/9/2020
S-411	AOI 3	Unconfined	1	***7***	2/27/2019	***1.5***	4/27/2021
S-412	AOI 3	Unconfined	1	***0.3***	2/27/2019	1	2/27/2019
S-413	AOI 3	Unconfined	1	***1***	2/26/2019	***0.64***	9/2/2020
S-414	AOI 3	Unconfined	1	***330,000***	9/5/2024	***54,000***	11/7/2024
S-428	AOI 3	Unconfined	1	***210***	9/3/2020	***15***	7/18/2023
S-429	AOI 3	Unconfined	1	***250,000***	10/8/2024	***21,000***	2/3/2025
S-430	AOI 3	Unconfined	1	***9,100***	6/3/2024	***5.4***	9/10/2024
S-431	AOI 3	Unconfined	1	***78***	9/10/2024	***4.9***	9/10/2024
S-433	AOI 3	Unconfined	1	***130***	9/9/2024	***2.1***	9/9/2024
S-434	AOI 3	Unconfined	1	***19***	7/19/2023	***0.87***	7/19/2023
S-435	AOI 3	Unconfined	1	***3.8***	6/3/2024	***0.62***	6/3/2024
S-436	AOI 3	Unconfined	1	1	9/10/2020	1	9/10/2020
S-437	AOI 3	Unconfined	1	***170,000***	9/5/2024	***30,000***	2/3/2025
S-438	AOI 3	Unconfined	1	***270,000***	9/9/2024	***22,000***	9/9/2024
S-439	AOI 3	Unconfined	1	***150,000***	9/9/2024	***13,000***	9/9/2024
S-479	AOI 7	Unconfined	1	***1,000***	9/9/2024	***12***	9/9/2024
S-480	AOI 3	Unconfined	1	***320***	9/6/2024	***2.5***	9/6/2024
S-481	AOI 3	Unconfined	1	***150,000***	9/9/2024	***23,000***	9/9/2024
S-482	AOI 3	Unconfined	1	***600,000***	9/9/2024	***110,000***	9/9/2024
S-483	AOI 3	Unconfined	1	***1,100***	7/25/2023	***2,400***	7/25/2023
S-484	AOI 3	Unconfined	1	***510,000***	10/8/2024	***29,000***	10/8/2024

Table 9-3
Initial Concentration Data Summary, 2019 to Present
UDEX Feed Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC , Philadelphia, PA

Sample Location	AOI	Hydrostratigraphic Unit	Model Layer Data	Maximum Concentration in Groundwater (µg/L)			
				Benzene	Date	Toluene	Date
S-485	AOI 3	Unconfined	1	***32,000***	6/3/2024	***2,800***	6/3/2024
C-129D	AOI 7	Lower Aquifer	7	***0.2***	2/26/2019	1	2/26/2019
S-280D	AOI 3	Lower Aquifer	5	1	2/26/2019	1	2/26/2019
S-284D	AOI 3	Lower Aquifer	5	***10***	4/23/2021	***4.2***	4/23/2021
S-507	AOI 3	Lower Aquifer	5	***16***	7/17/2023	***1.9***	7/17/2023
S-508	AOI 3	Lower Aquifer	7	0.5	9/5/2024	0.75	9/5/2024
S-509	AOI 3	Lower Aquifer	7	0.5	5/31/2024	0.75	5/31/2024
S-69D	AOI 3	Lower Aquifer	5	***3.4***	4/26/2023	1	2/26/2019

Notes:
2019 - 2023 data was used in modeling to fill in data gaps for wells that were not sampled in the 2024 - 2025 timeframe.

1.2	= Compound detected at concentration above the laboratory reporting limit (RL)
0.5	= Compound not detected at concentration above the RL
µg/L	= micrograms per liter
AOI	= area of interest

Table 9-4
Summary of Sensitivity Analysis Runs and Parameter Inputs
UDEX Feed Underground Line Release Remedial Investigation Report
Bellwether District Holdings, LLC, Philadelphia, PA

Run Number	Run Description	Degradation	Longitudinal Dispersivity		Retardation			Run Notes
		Half Life (days)	Zone 1 (feet)	Zone 2 (feet)	koc	foc (Zone 1)	foc (Zone 2)	
Benzene								
0	***Base***	*723*	*42.5*	*18.0*	*58*	*0.005*	*0.05*	*baseline approach; first order decaying LNAPL sources (half life 7.3 yrs[1]); see Appendix 2-K, Figure 1 plot of benzene concentration in LNAPL over time*
1	**No degradation**	none	42.5	18.0	58	0.005	0.05	no degradation
2	**Increased degradation rate**	362	42.5	18.0	58	0.005	0.05	0.5x half life
3	**Reduced dispersivity**	723	21.3	9.0	58	0.005	0.05	0.5x dispersivity
4	**Increased retardation**	723	42.5	18.0	58	0.010	0.10	2x retardation
5	**No retardation**	723	42.5	18.0	58	0.000	0.00	0 retardation
6	**Continuous source**	723	42.5	18.0	58	0.000	0.00	constant source
7	**No source**	723	42.5	18.0	58	0.005	0.05	Constant source removed
8	**Combined (more conservative)**	none	42.5	18.0	58	0.000	0.00	Combines runs 1, 5 and 6
9	**Combined (less conservative)**	362	21.3	9.0	58	0.005	0.05	Combines runs 2, 3, and 7

Notes:
koc = organic carbon partitioning coefficient
foc = Fraction of organic carbon

Appendix A Notice of Intent to Remediate Documentation

Stantec Consulting Services Inc.
1060 Andrew Drive, Suite 140
West Chester PA 19380-5602

June 4, 2025

C. David Brown, Ph. D., PG
Department of Environmental Protection
Southeast Regional Office
2 East Main Street
Norristown, PA 19401

Dear Mr. Brown,

Reference: Revised Notice of Intent to Remediate
UDEX Release Area – Point Breeze South Yard
Former PES Refinery
3144 West Passyunk Avenue
Philadelphia, PA 19153

In accordance with the Land Recycling and Environmental Remediation Standards Act (Act 2), enclosed is a revised Notice of Intent to Remediate (NIR) for the UDEX release area at the former Philadelphia Energy Solutions Refinery Point Breeze South Yard (site). The original NIR for the site was submitted in March 2022. The purpose of this revised NIR is to change the selected remediation standard for contamination in soil and groundwater to the site-specific standard for the UDEX release site.

Please call me at (610) 850-1420 if you have any questions or comments.

Sincerely,

Stantec Consulting Services Inc.

Andrew Klingbeil PG
Associate Geologist
Phone: (610) 840-2525
Mobile: (610) 850-1420
andrew.klingbeil@stantec.com

cc: Joseph Jeray, HRP Group

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF ENVIRONMENTAL CLEANUP AND BROWNFIELDS

NOTICE OF INTENT TO REMEDIATE

For DEP Use Only
PF # _____
Rem ID # _____

Date: 6/4/2025 NIR Status: ☐ New ☒ Revised

Act 1995-2 requires four general information items to be included in the NIR: the general location, listing of contaminants, intended use of property, and proposed remediation measures. In addition, indicate the standard(s) to be obtained and attach a scaled site map (if available). Certain project amendments or changes will require submission of a revised NIR, a new public notice, and a new notification to the municipality. Changes to information marked by (**) or (††) indicate when a new NIR and new public and municipal notices are needed. DEP should also be notified of any significant changes to the initial NIR submission, including the change of future use of the property, contaminants added or removed, change of standards from site-specific to background or Statewide health, any change in the media being investigated, or change of any contact information.

Property Name UDEX Release Area - Point Breeze South Yard

Former Name(s)/AKA Former Philadelphia Energy Solutions Refinery

Address/Location 3144 West Passyunk Avenue

City Philadelphia Zip Code 19153

**Municipality(s) Philadelphia County(ies) Philadelphia County

Tax Parcel ID# (if known) _____

Latitude 39 º (deg). 54 ‘ (min) 36 “ (sec)

Longitude 75 º (deg). 12 ‘ (min) 18 “ (sec)

Horizontal Collection Method GIS

Horizontal Reference Datum NAD83 Reference Point see Figure 1 attached

☐ **Wish to participate in the DEP/EPA One Cleanup Program.

Contact the Land Recycling Program Manager for details at landrecycling@pa.gov.

EPA ID#, if known _____

DEP ID#(s), if known 51-33620

(i.e., eFACTs primary facility ID#, storage tank facility ID#, water quality permit #, etc.)

Date Release Occurred (if known) July 2018

Date each municipality was notified of any plan or report submitted under any remediation standard

_____

Place the newspaper name and date that your notice of your plan/report submission was published

_____

** A change in municipality, the addition of a new municipality, or deciding to participate in the DEP/EPA One Cleanup Program requires a new NIR to be submitted with new public and municipal notifications.

Contamination, Land Usage, and Proposed Remediation Section

Provide a brief description of the site contamination, to the extent known, in plain language (e.g., fuel oil spill, historical chemical industrial area, etc.), the current and intended future use of the property in the box below.

In late July 2018, Bellwether District Holdings, LLC (BDH) (formerly known as Philadelphia Energy Solutions Refining and Marketing, LLC [PESRM]) identified a leak from an underground portion of a product line that conveys reformate (a gasoline blending stock used as feed for the UDEX unit). The line was emptied, isolated, bypassed and replaced with a new aboveground line constructed in the same location as the underground line. The future use of the property is expected to be non-residential.

Provide a general description of proposed remediation measures.

Multiple rounds of subsurface investigation have been conducted to characterize the nature and extent of the release. Additionally, at the time of this revised NIR, over 286,000 gallons of product have been recovered from the subsurface through a combination of remediation technologies including skimming, soil vapor extraction (SVE), and air sparging (AS). Full-scale SVE/AS system operations are expected to continue active cleanup through June 2025.

Standards Selection Section

Check all the boxes that apply for the appropriate contaminant groups according to the standard(s) and media of the remediation to be performed.

NOTE: Either the site-specific standard or a special industrial area requires a 30-day public and municipal comment period.

Contaminant Groups	Background		Statewide Health–Residential		Statewide Health–Non-Residential		††Site-Specific Standard		††Special Industrial Area	
	Soil	GW	Soil	GW	Soil	GW	Soil	GW	Soil	GW
Aviation Gasoline	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Diesel Fuel	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Fuel Oil No. 1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Fuel Oil No. 2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Fuel Oil No. 4	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Fuel Oil No. 5	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Fuel Oil No. 6	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Kerosene	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Jet Fuel	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Leaded Gasoline	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
New Motor Oil	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Unleaded Gasoline	☐	☐	☐	☐	☐	☐	☒	☒	☐	☐
Used Motor Oil	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Chlorinated Solvents	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Inorganics	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Lead	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
MTBE	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other Organics	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
PAHs	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
PCBs	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Pesticides	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
PFAS	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

GW: groundwater

†† Changing the selected standard from either background or Statewide health to the site-specific standard, changing to a combination of standards that includes the site-specific standard, or choosing the special industrial area designation requires a new NIR submission with new public and municipal notifications.

Please list individual contaminants here, by environmental medium and cleanup standard (optional):

benzene (groundwater and soil) (Site Specific Standard)

toluene (groundwater and soil) (Site Specific Standard)

Property Owner, Remediator/Participant, and Consultant
Complete the form below for each recipient obtaining a release of liability upon approval of the final report. Attach additional sheets as necessary.

Property Owner

Contact Person/Title Anne Garr / Assistant Secretary

eFACTs Client ID(If Known) Facility No. 51-33620

Phone Number (312) 283-4469

Email Address agarr@hilcoglobal.com

Company Name Bellwether District Holdings, LLC

EIN or Federal ID #

Address (street, city, state, zip) 3144 West Passyunk Ave, Philadelphia, PA 19145

Client Type (choose from list below) Pennsylvania Corporation

Client Types:

Association/Organization		
Authority	Limited Liability Partnership	Partnership-General
County	Municipality	Partnership-Limited
Estate/Trust	Non-Pennsylvania	Pennsylvania Corporation
Federal Agency	Government	School District
Individual	Other (Government)	Sole Proprietorship
Limited Liability company	Other (Non-Government)	State Agency

Consultant

Contact Person/Title Andrew Klingbeil

Email Address andrew.klingbeil@stantec.com

Phone Number (610) 850-1420

Company Name Stantec Consulting Services, Inc.

Address (street, city, state, zip) 1060 Andrew Dr, Suite 140, West Chester, PA, 19380

Other Participant (Remediator)

Contact Person/Title Anne Garr / Assistant Secretary

Relationship to Site Owner
(e.g. remediator, participant in cleanup if other than owner, etc.)

Phone Number (312) 283-4469

Email Address agarr@hilcoglobal.com

Company Name Bellwether District Holdings, LLC

EIN or Federal ID #

Address (street, city, state, zip) 3144 West Passyunk Ave, Philadelphia, PA 19145

Preparer of Notice of Intent to Remediate

Name Andrew Klingbeil

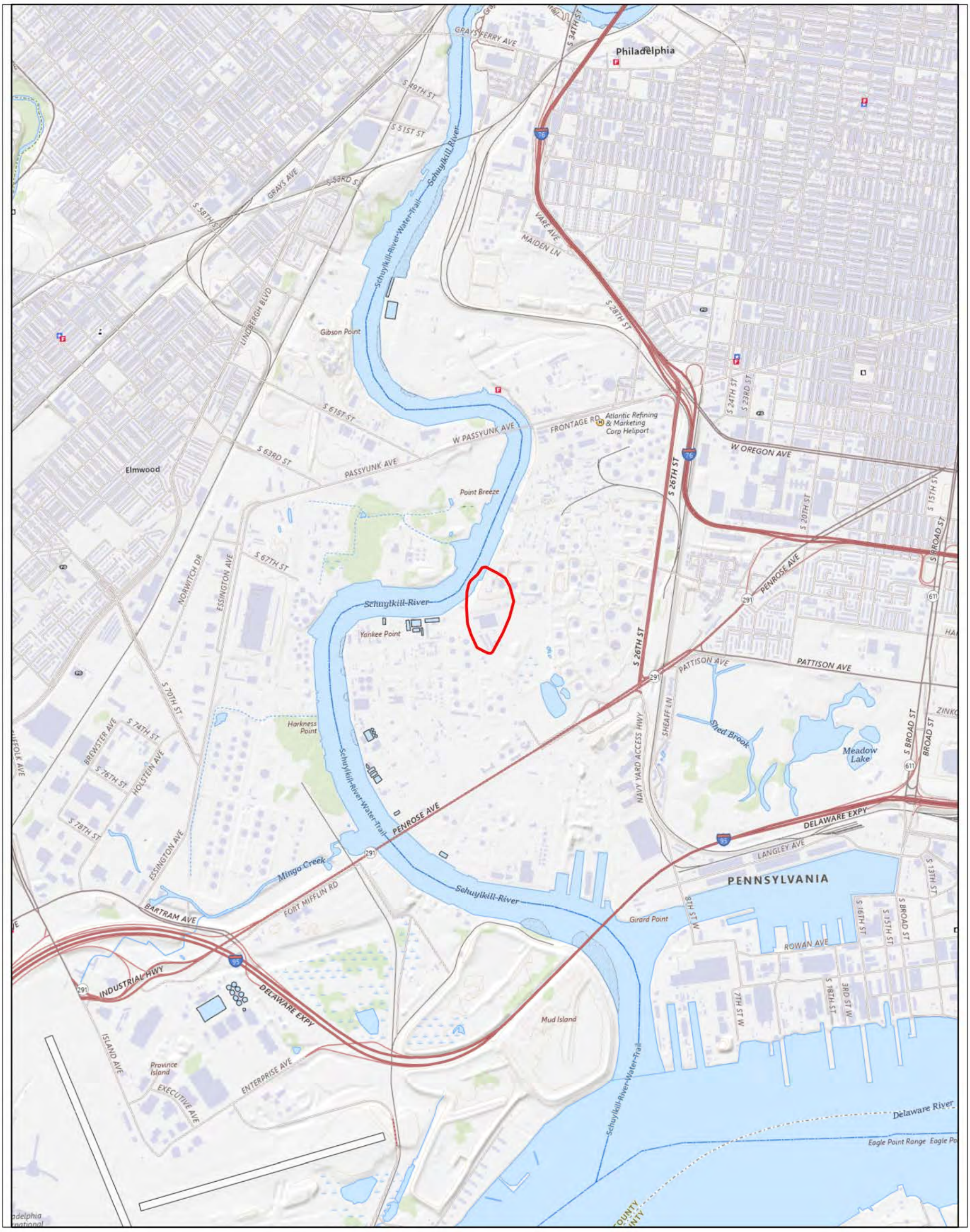
Title Associate Geologist

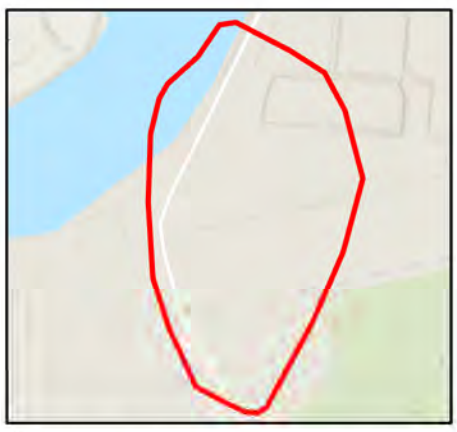
Phone Number (610) 850-1420

Email Address andrew.klingbeil@stantec.com

Company Name Stantec Consulting Services, Inc.

Address (street, city, state, zip) 1060 Andrew Dr, Suite 140, West Chester, PA, 19380





Notes
1. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
2. Coordinate System: NAD 1983 State Plane Pennsylvania South FIPS 3702 Feet
3. Source: Stantec
4. Service Layer Credits: ESRI, USGS National Map

Legend

UDEX Release Location

0 500 1,000 Feet

(At original document size of 11x17)
1:1,000

N

Stantec

PHILADELPHIA ENERGY SOLUTIONS

Project Location City of Philadelphia, Philadelphia County, PA	Prepared by ADK on 2024-04-14 TR by JK IR by GC
Client/Project PHILADELPHIA ENERGY SOLUTIONS REFINING & MARKETING LLC FORMER PES REFINERY 3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145	195603450
Figure No. **1**	
Title **PESRM UDEX RELEASE NOTICE OF INTENT TO REMEDIATE REFERENCE POINT**	

Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

C:\Users\aklingbeil\OneDrive - Stantec\Work Files\Projects\figure\fig_pesrm_udex_nir_rev_20240414.aprx Revised: 2025-05-21 By: aklingbeil

Stantec Consulting Services Inc.
1060 Andrew Drive, Suite 140
West Chester PA 19380-5602

June 4, 2025

Leigh Anne Rainford, MPH
Philadelphia Department of Public Health
Environmental Health Services
321 University Avenue - 2nd Floor
Philadelphia, PA 19104

Dear Ms. Rainford,

Reference: Revised Notice of Intent to Remediate
UDEX Release Area – Point Breeze South Yard
Former PES Refinery
3144 West Passyunk Avenue
Philadelphia, PA 19153

The Land Recycling and Environmental Remediation Standards Act (Act 2) requires that a Notice of Intent to Remediate (NIR) a site be provided to the municipality in which the site is located. On behalf of Bellwether District Holdings, LLC (BDH), this notification is to inform the City of Philadelphia of the submission of a revision to the previously submitted NIR for this project. The purpose of the revised NIR is to change the selected remediation standard from the Statewide Health Standard to the Site-Specific Standard for the UDEX Release area. A copy of the revised NIR (enclosed) will be sent to the Pennsylvania Department of Environmental Protection (PADEP) and published in the Pennsylvania Bulletin.

Please call me at (610) 850-1420 if you have any questions concerning the proposed remediation.

Sincerely,

Stantec Consulting Services Inc.

Andrew Klingbeil PG
Associate Geologist
Phone: (610) 840-2525
Mobile: (610) 850-1420
andrew.klingbeil@stantec.com

cc: C. David Brown, PADEP
Joseph Jeray, HRP Group

The Philadelphia Inquirer
100 S. INDEPENDENCE MALL W, STE 600, PHILADELPHIA, PA 19106

Affidavit of Publication

On Behalf of:
STANTEC
1060 Andrew Drive
WEST CHESTER, PA 19380

STATE OF PENNSYLVANIA COUNTY OF PHILADELPHIA:

Before the undersigned authority personally appeared the undersigned who, on oath represented a and say: that I am an employee of The Philadelphia Inquirer, LLC, and am authorized to make this affidavit of publication, and being duly sworn, I depose and say:

1. The Philadelphia Inquirer, LLC is the publisher of the Philadelphia Daily News, with its headquarters at 100 S. Independence Mall West, Suite 600, Philadelphia, PA 19106.
2. The Philadelphia Daily News is an edition of The Philadelphia Inquirer. The Philadelphia Daily News is continuously published and distributed Sunday-Friday in the City of Philadelphia, count and state aforesaid.
3. The printed notice or publication attached hereto set forth on attached
hereto was published in all regular print editions of the Philadelphia Daily News on

Legal Notices

as published in **Daily News Legals** in the issue(s) of:

6/4/2025

4. Under oath, I state that the following is true and correct, and that neither I nor The Philadelphia Inquirer, LLC have any is interest in the subject matter of the aforesaid notice or advertisement.

Helene Sweeney

Nancy S. Fisher

Notary Public

My Commission Expires:

Commonwealth of Pennsylvania - Notary Seal
Nancy S Fisher, Notary Public
Philadelphia County
My Commission Expires June 27, 2027
Commission Number 1433937

Ad No: 188203
Customer No: 103409

COPY OF ADVERTISEMENT

Notice of an Intent to Remediate
to an Environmental Standard.
(Sections 302(e)(1)(ii), 303(h)(1)(ii),
304(n)(1)(i), and 305(c)(1))

Pursuant to the Land Recycling and Environmental Remediation Standards Act, the act of May 19, 1995, P.L. 4, No. 1995-2., notice is hereby given that Bellwether District Holdings, LLC (BDH) (formerly known as Philadelphia Energy Solutions Refining and Marketing LLC) will submit to the Pennsylvania Department of Environmental Protection a revised Notice of Intent to Remediate a site located at 3144 West Passyunk Avenue, Philadelphia, PA. This revised Notice of Intent to Remediate states that the site is the Former Philadelphia Energy Solutions Refinery. The site has been found to be contaminated with petroleum released from an underground portion of a product line that conveyed reformate (a gasoline blending stock used as feed from an UDEX unit). BDH has revised a previously submitted Notice of Intent to Remediate this release to select the site-specific standard for cleanup. BDH has been remediating this release since 2018 through a combination of technologies including separate phase petroleum recovery, soil vapor extraction (SVE), and air sparging (AS). The proposed future use of the property will be non-residential for commercial/industrial use.

The Act provides for a 30-day public comment period for site-specific standard remediations. The 30-day comment period is initiated with the publication of this notice. Until July 4, 2025, the City of Philadelphia may submit a request to BDH to develop and implement a public involvement plan involving the municipality in the development of the remediation and reuse plans for the site. Copies of these requests and of any comments should also be submitted to C. David Brown at the Pennsylvania Department of Environmental Protection Southeast Regional Office located at 2 East Main Street, Norristown, PA.

From: FedEx Tracking
To: Klingbeil, Andrew
Subject: Your shipment was delivered 881774480141
Date: Thursday, June 5, 2025 9:05:06 AM

Your shipment was delivered.

Delivery Date

Thu, 06/05/2025
9:01am

Delivered to

7801 ESSINGTON AVE, 19153, PA 19153

Received by

H.River

Report missing package

How was your delivery?

Tracking details

Tracking ID	881774480141
From	Stantec Consulting Corporation 1060 ANDREW DR STE 140 WEST CHESTER, PA, US 19380

To	Phila. Dept. of Public Health 7801 Essington Avenue 19153, PA, US 19153
Ship date	Wed 6/04/2025 05:01 PM
Number of pieces	1
Total shipment weight	1.00 LB
Service	FedEx Standard Overnight®
Reference	195603450.202
Shipper reference	195603450.202

TRACK SHIPMENT

FedEx

Plan like a pro

Got gifts for moms, dads, or grads? Drop them off at one of thousands of convenient retail locations, including FedEx Office, FedEx Ship Centers, Walgreens, and more. See our shipping options and packing tips here.

FIND LOCATIONS

Please do not respond to this message. This email was sent from an unattended mailbox. This report was generated at approximately 8:04 AM CDT 06/05/2025.

All weights are estimated.

To track the latest status of your shipment, click on the tracking number above.

Standard transit is the date and time the package is scheduled to be delivered by, based on the selected service, destination and ship date. Limitations and exceptions may apply. Please see the FedEx Service Guide for terms and conditions of service, including the FedEx Money-Back Guarantee, or contact your FedEx Customer Support representative.

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2610-FM-BECB0010 6/2014

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF ENVIRONMENTAL CLEANUP AND BROWNFIELDS

For DEP Use Only
PF #_____
Rem ID #_____

NOTICE OF INTENT TO REMEDIATE

Act 1995-2 requires four general information items to be included in the NIR: the general location, listing of contaminants, intended use of property, and proposed remediation measures. In addition, indicate the standard(s) to be obtained (if known) and attach a scaled site map (if available).

Property Name UDEX Release Area – Point Breeze South Yard

Former Name(s) / AKA Former Philadelphia Energy Solutions Refinery

Address / Location 3144 Passyunk Avenue

City Philadelphia Zip Code 19153

Municipality(s) Philadelphia County(ies) Philadelphia County

Latitude 39 º (deg). 54 ‘ (min) 36 “ (sec) Longitude 75 º (deg). 12 ‘ (min) 18 “ (sec)

Horizontal Collection Method GIS

Horizontal Reference Datum NAD83 Reference Point see Figure 1 attached

☐ Wish to participate in the DEP/EPA MOA. Contact the Land Recycling Program Manager at landrecycling@pa.gov for details.

EPA ID#, if known

DEP ID#(s), if known 51-33620
(i.e., eFACTS site ID#, storage tank facility ID#, water quality permit #, watershed permit, air quality permit #, etc.)

Date Release Occurred (if known) July 2018

Provide a brief description of the site contamination in plain language (e.g. fuel oil spill, historical chemical industrial area contamination), the names of any know primary contaminants to be addressed, and the intended future use of the property.

In late July 2018, PESRM identified a leak from an underground portion of a product line that conveys reformate (a gasoline blending stock used as feed for the UDEX unit). The line was emptied, isolated, bypassed and replaced with a new aboveground line constructed in the same location as the underground line. The future use of the property is expected to be non-residential.

Provide a general description of proposed remediation measures.

Multiple rounds of subsurface investigation have been conducted to characterize the nature and extent of the release. Additionally, over 96,000 gallons of free product was recovered from the subsurface by skimmer pumps operated at three recovery wells between September 2018 and November 2021, and over 24,000 gallons of free product was converted to vapor, extracted, and combusted during a pilot test of soil vapor extraction (SVE) technology between April 2021 and January 2022. A full-scale SVE system is being designed and is expected to begin operation in 2Q 2022.

Remediation Standard(s) planned (if known at this time):

☐ Unknown at this time	☐ Soil	☐ Groundwater
☐ Background Contaminants:	☐ Soil	☐ Groundwater
☐ Statewide Health - Residential Contaminants:	☐ Soil	☐ Groundwater
☒ Statewide Health – Non-Residential Contaminants: petroleum constituents	☒ Soil	☒ Groundwater
☐ Site Specific Contaminants:	☐ Soil	☐ Groundwater
☐ Special Industrial Area* Contaminants:	☐ Soil	☐ Groundwater

*NOTE: Specific standard or Special Industrial Area require a 30-day municipal comment period

Remediator / Property Owner / Consultant. Complete the form below for ***each*** recipient obtaining a release of liability upon approval of the final report. Attach additional sheets as necessary.

Remediator

Contact Person/Title Anne Garr / Assistant Secretary — eFACTS Client ID* Facility No. 51-33620

Relationship to Site Owner — Client Type* LLC
(e.g. owner, remediator, participant in cleanup, consultant, etc.)

Phone Number (312) 283-4469 — Email Address agarr@hilcoglobal.com

Company Name Philadelphia Energy Solutions Refining and Marketing LLC — EIN or Federal ID #

Address (street, city, state, zip) 111 S Wacker Dr, Suite 3000, Chicago, IL, 60606

Property Owner

Contact Person/Title Anne Garr / Assistant Secretary — eFACTS Client ID* Facility No. 51-33620

Relationship to Site Owner — Client Type* LLC
(e.g. owner, remediator, participant in cleanup, consultant, etc.)

Phone Number (312) 283-4469 — Email Address agarr@hilcoglobal.com

Company Name Philadelphia Energy Solutions Refining and Marketing LLC — EIN or Federal ID #

Address (street, city, state, zip) 111 S Wacker Dr, Suite 3000, Chicago, IL, 60606

Consultant

Contact Person/Title Kevin Long / Principal Consultant — eFACTS Client ID*

Relationship to Site Consultant — Client Type* Corporation
(e.g. owner, remediator, participant in cleanup, consultant, etc.)

Phone Number 609-236-8171, ext 93 — Email Address kevin.long@terraphase.com

Company Name Terraphase Engineering Inc. — EIN or Federal ID # 27-3543127

Address (street, city, state, zip) 100 Canal Pointe Blvd, Suite 108, Princeton, NJ 08540

*Include eFACTS Client ID (if known) – "Client Types" below:

Association/Organization	Limited Liability company	Partnership-General
Authority	Limited Liability Partnership	Partnership-Limited
County	Municipality	School District
Estate/Trust	Non-Pennsylvania Government	Sole Proprietorship
Federal Agency	Other (Non-Government)	State Agency
Individual	Pennsylvania Corporation	

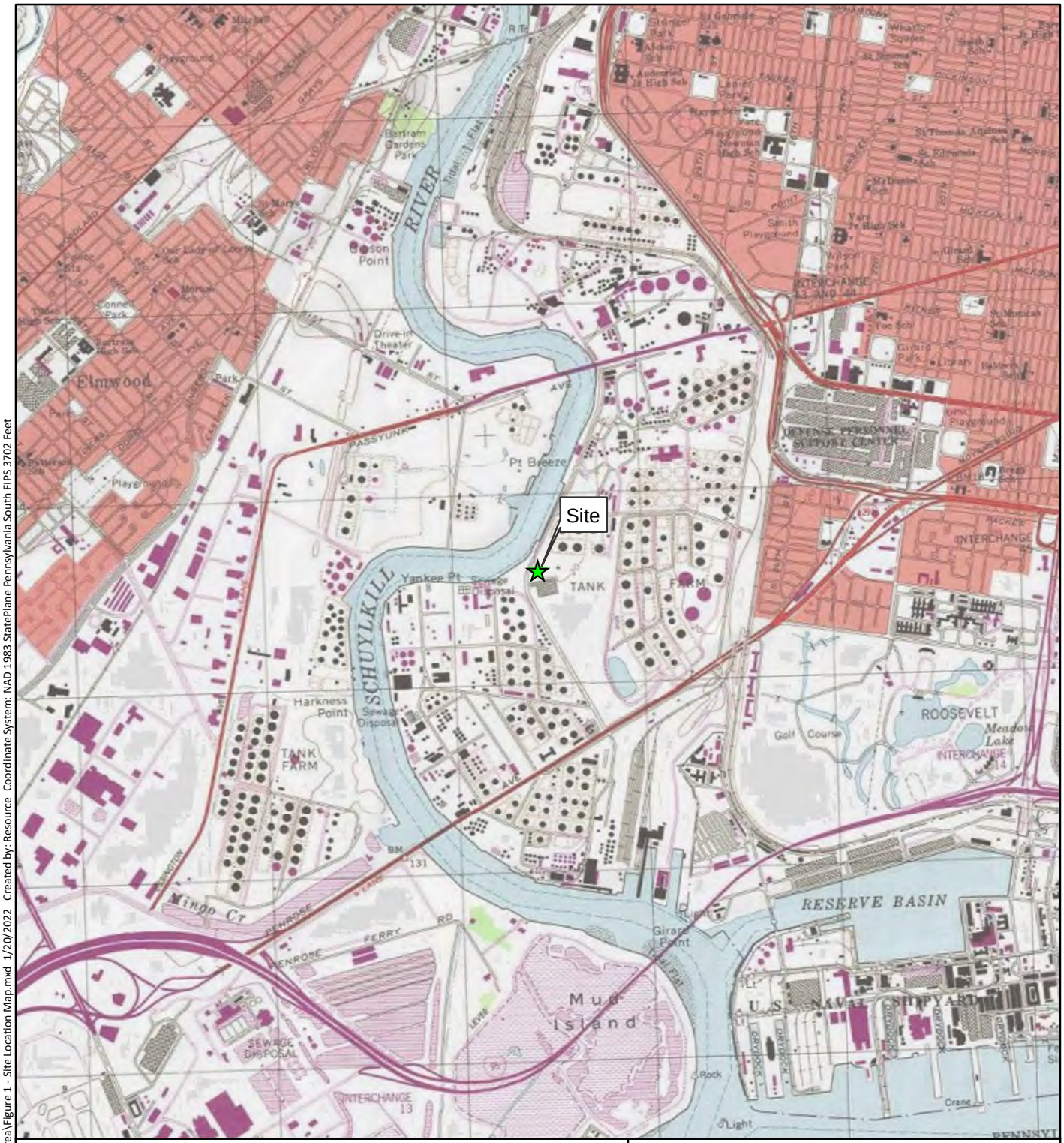
Preparer of Notice of Intent to Remediate

Name Kevin Long / Principal Consultant — Title Principal Consultant

Phone Number 609-236-8171, ext 93 — Email Address kevin.long@terraphase.com

Company Name Terraphase Engineering Inc. — eFACTS Client ID

Address (street, city, state, zip) 100 Canal Pointe Blvd, Suite 108, Princeton, NJ 08540



0 2,500 5,000 Feet

1 inch = 2,500 feet

N

Legend

Site Location

Base Map: USGS Philadelphia (1995) 7.5 Minute Quadrangle.

SAFETY FIRST

terraphase engineering

CLIENT: Philadelphia Energy Solutions Refining and Marketing LLC

PROJECT: UDEX Release Area

PROJECT NUMBER: P044.001.007

Site Location Map

FIGURE 1

File: N:\GIS\Prj\P044.001_PESRM-PES\MXDs\UDEX Release Area\Figure 1 - Site Location Map.mxd 1/20/2022 Created by: Resource Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

terraphase engineering

March 1, 2022

Ms. Leigh Anne Rainford
Philadelphia Department of Public Health
Environmental Health Services
321 University Avenue – 2nd Floor
Philadelphia, PA 19104

sent via UPS, Proof of Delivery Requested

Subject: **Notice of Intent to Remediate**
UDEX Release Area – Point Breeze South Yard
Former Philadelphia Energy Solutions Refinery
3144 West Passyunk Ave.
Philadelphia, PA 19153

Dear Ms. Rainford:

The Land Recycling and Environmental Remediation Standards Act (Act 2) requires that a Notice of Intent to Remediate (NIR) be provided to the municipality in which the site is located. In accordance with this provision of Act 2, Terraphase Engineering, Inc. (Terraphase), on behalf of Philadelphia Energy Solutions Refining and Marketing LLC (PESRM), is formally notifying you of PESRM's intent to remediate the above-referenced site to the non-residential Statewide Health Standard. A copy of the Notice of Intent to Remediate, which will be sent to the Department of Environmental Protection (DEP), is enclosed. This notice will also be published in the Pennsylvania Bulletin, and a summary of the notice will be placed in a local newspaper.

Should you have any questions or comments regarding the proposed remediation, please contact me at kevin.long@terraphase.com or 609-236-8171, ext. 93.

Sincerely,

for Terraphase Engineering Inc.

Kevin L. Long
Principal Consultant

KL:cs

Enclosure: Notice of Intent to Remediate

cc: Julianna Connolly (jconnolly@hilcoglobal.com)
Joseph Jeray (jjeray@hilcoglobal.com)

Proof of Delivery

Dear Customer,

This notice serves as proof of delivery for the shipment listed below.

Tracking Number
1Z75YA673037794200

Weight
0.50 LBS

Service

UPS Next Day Air Saver®

Shipped / Billed On
03/01/2022

Delivered On

03/02/2022 10:14 A.M.

Delivered To
PHILADELPHIA, PA, US

Received By

CD MONROE

Left At
Office

Thank you for giving us this opportunity to serve you. Details are only available for shipments delivered within the last 120 days. Please print for your records if you require this information after 120 days.

Sincerely,

UPS

Tracking results provided by UPS: 03/02/2022 11:09 A.M. EST

Notice of an Intent
to Remediate to an Environmental Standard.
(Sections 302(e)(1)(ii), 303(h)(1)(ii),
304(n)(1)(i), and 305(c)(1))

Pursuant to the Land Recycling and Environmental Remediation Standards Act, the act of May 19, 1995, P.L. 4, No. 1995-2., notice is hereby given that Philadelphia Energy Solutions Refining and Marketing LLC will submit to the Pennsylvania Department of Environmental Protection a Notice of Intent to Remediate a site located at 3144 West Passyunk Avenue, Philadelphia. This Notice of Intent to Remediate states that the site is the Former Philadelphia Energy Solutions Refinery. The site has been found to be contaminated with separate-phase petroleum release from an underground portion of a product line that conveys reformate (a gasoline blending stock used as feed from an UDEX unit). Philadelphia Energy Solutions Refining and Marketing LLC has indicated that the proposed remediation measures will be to monitor and remove separate-phase petroleum from monitoring and recovery wells. In addition, a soil vapor extraction (SVE) system is being designed to destroy the remaining separate-phase petroleum, which is expected to begin operation in 2Q 2022. The proposed future use of the property will be non-residential for commercial/industrial use.

The Philadelphia Inquirer

801 MARKET STREET, SUITE 300, PHILADELPHIA, PA 19107

Affidavit of Publication

On Behalf of:
TERRAPHASE ENGINEERING
1100 E HECTOR ST
SUITE 416
CONSHOHOCKEN, PA 19428

STATE OF PENNSYLVANIA COUNTY OF PHILADELPHIA:

Before the undersigned authority personally appeared the undersigned who, on oath represented a and say: that I am an employee of The Philadelphia Inquirer, LLC, and am authorized to make this affidavit of publication, and being duly sworn, I depose and say:

1. The Philadelphia Inquirer, LLC is the publisher of the Philadelphia Daily News, with its headquarters at 801 Market Street, Suite 300, Philadelphia, Pennsylvania 19107.
2. The Philadelphia Daily News is an edition of The Philadelphia Inquirer. The Philadelphia Daily News is continuously published and distributed Sunday-Friday in the City of Philadelphia, count and state aforesaid.
3. The printed notice or publication attached hereto set forth on attached
hereto was published in all regular print editions of the Philadelphia Daily News on

Legal Notices

as published in **Daily News Legals** in the issue(s) of:

3/4/2022

4. Under oath, I state that the following is true and correct, and that neither I nor The Philadelphia Inquirer, LLC have any is interest in the subject matter of the aforesaid notice or advertisement.

Helene Sweeney

Kathern V. Harley
Notary Public

My Commission Expires:

Commonwealth of Pennsylvania - Notary Seal
KATHERINE V. HARLEY, Notary Public
Philadelphia County
My Commission Expires May 25, 2025
Commission Number 1312829

Ad No: 98354
Customer No: 104799

COPY OF ADVERTISEMENT

Notice of an Intent
to Remediate to an Environmental Standard.
(Sections 302(e)(1)(ii), 303(h)(1)(ii),
304(n)(1)(i), and 305(c)(1))

Pursuant to the Land Recycling and Environmental Remediation Standards Act, the act of May 19, 1995, P.L. 4, No. 1995-2., notice is hereby given that Philadelphia Energy Solutions Refining and Marketing LLC will submit to the Pennsylvania Department of Environmental Protection a Notice of Intent to Remediate a site located at 3144 West Passyunk Avenue, Philadelphia. This Notice of Intent to Remediate states that the site is the Former Philadelphia Energy Solutions Refinery. The site has been found to be contaminated with separate-phase petroleum release from an underground portion of a product line that conveys reformate (a gasoline blending stock used as feed from an UDEX unit). Philadelphia Energy Solutions Refining and Marketing LLC has indicated that the proposed remediation measures will be to monitor and remove separate-phase petroleum from monitoring and recovery wells. In addition, a soil vapor extraction (SVE) system is being designed to destroy the remaining separate-phase petroleum, which is expected to begin operation in 2Q 2022. The proposed future use of the property will be non-residential for commercial/industrial use.

Appendix B Report Notices

The Philadelphia Inquirer
100 S. INDEPENDENCE MALL W, STE 600, PHILADELPHIA, PA 19106

Affidavit of Publication

On Behalf of:
STANTEC
1060 Andrew Drive
WEST CHESTER, PA 19380

STATE OF PENNSYLVANIA COUNTY OF PHILADELPHIA:

Before the undersigned authority personally appeared the undersigned who, on oath represented a and say: that I am an employee of The Philadelphia Inquirer, LLC, and am authorized to make this affidavit of publication, and being duly sworn, I depose and say:

1. The Philadelphia Inquirer, LLC is the publisher of the Philadelphia Daily News, with its headquarters at 100 S. Independence Mall West, Suite 600, Philadelphia, PA 19106.
2. The Philadelphia Daily News is an edition of The Philadelphia Inquirer. The Philadelphia Daily News is continuously published and distributed Sunday-Friday in the City of Philadelphia, count and state aforesaid.
3. The printed notice or publication attached hereto set forth on attached
hereto was published in all regular print editions of the Philadelphia Daily News on

Legal Notices

as published in **Daily News Legals** in the issue(s) of:

10/2/2025

4. Under oath, I state that the following is true and correct, and that neither I nor The Philadelphia Inquirer, LLC have any is interest in the subject matter of the aforesaid notice or advertisement.

Helene Sweeney

Nancy S. Fisher

Notary Public

My Commission Expires:

Commonwealth of Pennsylvania - Notary Seal
Nancy S Fisher, Notary Public
Philadelphia County
My Commission Expires June 27, 2027
Commission Number 1433937

Ad No: 194978
Customer No: 103409

COPY OF ADVERTISEMENT

Bellwether District – UDEX Release Remedial Investigation Report

Pursuant to the Land Recycling and Environmental Remediation Standards Act, the act of May 19, 1995, P.L. 4, No. 1995-2., notice is hereby given that Bellwether District Holdings, LLC (BDH) is submitting a Remedial Investigation Report to the Pennsylvania Department of Environmental Protection (PADEP) Southeast Regional Office for the UDEX release site at the former Philadelphia Energy Solutions Refinery located at 3144 West Passyunk Avenue, Philadelphia, Philadelphia County, Pennsylvania on October 2, 2025. The report is being submitted in accordance with site-specific remediation standards.

Stantec Consulting Services Inc.
1060 Andrew Drive, Suite 140
West Chester PA 19380-5602

September 30, 2025

Leigh Anne Rainford, MPH
Philadelphia Department of Public Health
Environmental Health Services
321 University Avenue - 2nd Floor
Philadelphia, PA 19104

Dear Ms. Rainford,

Reference: Submission of Remedial Investigation Report
UDEX Release Area – Point Breeze South Yard
Former PES Refinery
3144 West Passyunk Avenue
Philadelphia, PA 19153

This letter is to provide notice to the City of Philadelphia that Bellwether District Holdings, LLC (BDH) is submitting a Remedial Investigation Report (RIR) to the Pennsylvania Department of Environmental Protection (PADEP) Southeast Regional Office on October 2, 2025, for the UDEX Release located in the Point Breeze South Yard area of the former Philadelphia Energy Solutions Refinery at 3144 West Passyunk Avenue in Philadelphia, Pennsylvania (Site). The RIR provides information for the Site under Pennsylvania's Land Recycling and Environmental Remediation Standards Act, the Act of May 19, 1995, P.L. #4, No. 2 (Act 2) in accordance with the site-specific remediation standards.

Please call me at (610) 850-1420 if you have any questions concerning the RIR submission.

Sincerely,

Stantec Consulting Services Inc.

Andrew Klingbeil PG
Associate Geologist
Phone: (610) 840-2525
Mobile: (610) 850-1420
andrew.klingbeil@stantec.com

cc: C. David Brown, PADEP (via email)
Joseph Jeray, HRP Group (via email)

From: FedEx Tracking
To: Klingbeil, Andrew
Subject: Your shipment was delivered 884800583717
Date: Wednesday, October 1, 2025 9:27:43 AM

Your shipment was delivered.

Delivery Date

Wed, 10/01/2025
9:22am

Delivered to

7801 ESSINGTON AVE, PHILADELPHIA, PA 19153

Received by

H.River

Report missing package

How was your delivery?

Tracking details

Tracking ID	884800583717
From	Stantec Consulting Corporation 1060 ANDREW DR STE 140 WEST CHESTER, PA, US 19380

To	Philadelphia Dept. of Public Health 7801 Essington Avenue PHILADELPHIA, PA, US 19153
Ship date	Tue 9/30/2025 07:40 PM
Number of pieces	1
Total shipment weight	0.50 LB
Service	FedEx Priority Overnight®
Reference	195603450.202
Shipper reference	195603450.202

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Appendix C Reformate Safety Data Sheet

SAFETY DATA SHEET

1. Identification

Product identifier	**REFORMATE LIGHT MTR**
Other means of identification	None.
Recommended use	Motor Fuel
Recommended restrictions	None known.

Manufacturer/Importer/Supplier/Distributor information

Manufactor

Company name	Philadelphia Energy Solutions
Address	3144 W. Passyunk Ave Philadelphia, Pennsylvania, 19145
E-mail	msds@PES-Companies.com
Emergency phone number	
24 Hours	(215) 339-5400
Information	
Product Safety Information	(215) 339-2000

2. Hazard(s) identification

Physical hazards	Flammable liquids	Category 2
Health hazards	Germ cell mutagenicity	Category 1B
	Carcinogenicity	Category 1B
	Aspiration hazard	Category 1
Environmental hazards	Hazardous to the aquatic environment, acute hazard	Category 2
OSHA defined hazards	Not classified.	

Label elements



Signal word	Danger
Hazard statement	Highly flammable liquid and vapor. May be fatal if swallowed and enters airways. Causes skin irritation. May cause drowsiness or dizziness. May cause genetic defects. May cause cancer. Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

Precautionary statement

Prevention	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Avoid breathing mist or vapor. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.
Response	If swallowed: Immediately call a poison center/doctor. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention. If inhaled: Remove person to fresh air and keep comfortable for breathing. If exposed or concerned: Get medical advice/attention. Call a poison center/doctor if you feel unwell. Do NOT induce vomiting. Take off contaminated clothing and wash before reuse. In case of fire: Use appropriate media to extinguish. Collect spillage.
Storage	Store in a well-ventilated place. Keep container tightly closed. Store in a well-ventilated place. Keep cool. Store locked up.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC)	Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment. Sparks may ignite liquid and vapor. May cause flash fire or explosion.

3. Composition/information on ingredients

Mixtures

Chemical name	CAS number	%
Catalytic Reformed Light Naphtha	64741-63-5	100

Constituents

Chemical name	CAS number	%
Benzene	71-43-2	0 - 20
Toluene	108-88-3	0 - 20
Naphtha (petroleum), light straight-run	64741-46-4	10
Xylene	1330-20-7	0 - 10

Composition comments	Occupational Exposure Limits for constituents are listed in Section 8.

4. First-aid measures

Inhalation	If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Call a physician if symptoms develop or persist.
Skin contact	Take off immediately all contaminated clothing. Rinse skin with water/shower. Get medical attention if irritation develops and persists.
Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Get medical attention if irritation develops and persists.
Ingestion	Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.
Most important symptoms/effects, acute and delayed	Aspiration may cause pulmonary edema and pneumonitis. Direct contact with eyes may cause temporary irritation.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim under observation. Symptoms may be delayed.
General information	Take off all contaminated clothing immediately. IF exposed or concerned: Get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before reuse.

5. Fire-fighting measures

Suitable extinguishing media	Water fog. Foam. Carbon dioxide (CO2). Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	Vapors may form explosive mixtures with air. Vapors may travel considerable distance to a source of ignition and flash back. This product is a poor conductor of electricity and can become electrostatically charged. If sufficient charge is accumulated, ignition of flammable mixtures can occur. To reduce potential for static discharge, use proper bonding and grounding procedures. This liquid may accumulate static electricity when filling properly grounded containers. Static electricity accumulation may be significantly increased by the presence of small quantities of water or other contaminants. Material will float and may ignite on surface of water. During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	Highly flammable liquid and vapor.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Wear appropriate protective equipment and clothing during clean-up. Avoid breathing mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Use appropriate containment to avoid environmental contamination. Transfer by mechanical means such as vacuum truck to a salvage tank or other suitable container for recovery or safe disposal. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up

Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Take precautionary measures against static discharge. Use only non-sparking tools. Keep combustibles (wood, paper, oil, etc.) away from spilled material. This product is miscible in water.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Prevent product from entering drains. Following product recovery, flush area with water.

Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

Environmental precautions

Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground. Inform appropriate managerial or supervisory personnel of all environmental releases. Use appropriate containment to avoid environmental contamination.

7. Handling and storage

Precautions for safe handling

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. When using do not smoke. Explosion-proof general and local exhaust ventilation. Minimize fire risks from flammable and combustible materials (including combustible dust and static accumulating liquids) or dangerous reactions with incompatible materials. Handling operations that can promote accumulation of static charges include but are not limited to: mixing, filtering, pumping at high flow rates, splash filling, creating mists or sprays, tank and container filling, tank cleaning, sampling, gauging, switch loading, vacuum truck operations. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use non-sparking tools and explosion-proof equipment. Should be handled in closed systems, if possible. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices.

For additional information on equipment bonding and grounding, refer to the Canadian Electrical Code in Canada, (CSA C22.1), or the American Petroleum Institute (API) Recommended Practice 2003, "Protection Against Ignitions Arising out of Static, Lightning, and Stray Currents" or National Fire Protection Association (NFPA) 77, "Recommended Practice on Static Electricity" or National Fire Protection Association (NFPA) 70, "National Electrical Code".

Conditions for safe storage, including any incompatibilities

Store locked up. Keep away from heat, sparks and open flame. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Eliminate sources of ignition. Avoid spark promoters. Ground/bond container and equipment. These alone may be insufficient to remove static electricity. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Store in a well-ventilated place. Keep in an area equipped with sprinklers. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Constituents	Type	Value
Benzene (CAS 71-43-2)	STEL	5 ppm
	TWA	1 ppm

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Constituents	Type	Value
Xylene (CAS 1330-20-7)	PEL	435 mg/m3
		100 ppm

US. OSHA Table Z-2 (29 CFR 1910.1000)

Constituents	Type	Value
Benzene (CAS 71-43-2)	Ceiling	25 ppm
	TWA	10 ppm
Toluene (CAS 108-88-3)	Ceiling	300 ppm
	TWA	200 ppm

US. ACGIH Threshold Limit Values

Constituents	Type	Value
Xylene (CAS 1330-20-7)	STEL	150 ppm
	TWA	100 ppm
Benzene (CAS 71-43-2)	STEL	2.5 ppm
	TWA	0.5 ppm
Toluene (CAS 108-88-3)	TWA	20 ppm

US. NIOSH: Pocket Guide to Chemical Hazards

Constituents	Type	Value
Xylene (CAS 1330-20-7)	STEL	655 mg/m3
		150 ppm
	TWA	435 mg/m3
		100 ppm
Benzene (CAS 71-43-2)	STEL	1 ppm
	TWA	0.1 ppm
Toluene (CAS 108-88-3)	STEL	560 mg/m3
		150 ppm
	TWA	375 mg/m3
		100 ppm

Biological limit values

ACGIH Biological Exposure Indices

Constituents	Value	Determinant	Specimen	Sampling Time
Xylene (CAS 1330-20-7)	1.5 g/g	Methylhippuric acids	Creatinine in urine	*
Benzene (CAS 71-43-2)	25 µg/g	S-Phenylmercapturic acid	Creatinine in urine	*
Toluene (CAS 108-88-3)	0.3 mg/g	o-Cresol, with hydrolysis	Creatinine in urine	*
	0.03 mg/l	Toluene	Urine	*
	0.02 mg/l	Toluene	Blood	*

* - For sampling details, please see the source document.

Exposure guidelines

US - California OELs: Skin designation

Benzene (CAS 71-43-2)	Can be absorbed through the skin.
Toluene (CAS 108-88-3)	Can be absorbed through the skin.

US - Minnesota Haz Subs: Skin designation applies

Toluene (CAS 108-88-3)	Skin designation applies.

US ACGIH Threshold Limit Values: Skin designation

Benzene (CAS 71-43-2)	Can be absorbed through the skin.

Appropriate engineering controls Explosion-proof general and local exhaust ventilation. Eye wash fountain and emergency showers are recommended.

Individual protection measures, such as personal protective equipment

Eye/face protection	Chemical respirator with organic vapor cartridge and full facepiece.
Skin protection	
Hand protection	Wear appropriate chemical resistant gloves.
Other	Wear suitable protective clothing. Use of an impervious apron is recommended.
Respiratory protection	Chemical respirator with organic vapor cartridge and full facepiece.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	When using do not smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	
Physical state	Liquid.
Form	Liquid.
Color	Colorless.
Odor	Gasoline.
Odor threshold	Not available.
pH	Not available.
Melting point/freezing point	Not available.
Initial boiling point and boiling range	100 - 435 °F (37.78 - 223.89 °C)
Flash point	-40.0 °F (-40.0 °C) Closed Cup
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	1.5 %
Flammability limit - upper (%)	7.6 %
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	525 mm Hg at 20°C
Vapor density	Not available.
Relative density	0.75
Solubility(ies)	
Solubility (water)	Nil
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	750 °F (398.89 °C)
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Percent volatile	100

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Avoid heat, sparks, open flames and other ignition sources. Avoid temperatures exceeding the flash point. Contact with incompatible materials.
Incompatible materials	Strong oxidizing agents.

Hazardous decomposition products No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Inhalation May cause drowsiness and dizziness. Headache. Nausea, vomiting.

Skin contact Causes skin irritation.

Eye contact Direct contact with eyes may cause temporary irritation.

Ingestion Droplets of the product aspirated into the lungs through ingestion or vomiting may cause a serious chemical pneumonia.

Symptoms related to the physical, chemical and toxicological characteristics May cause drowsiness and dizziness. Headache. Nausea, vomiting. Aspiration may cause pulmonary edema and pneumonitis. Skin irritation. May cause redness and pain.

Information on toxicological effects

Acute toxicity May be fatal if swallowed and enters airways. Narcotic effects.

Toxicological data

Constituents	Species	Test Results
Xylene (CAS 1330-20-7)		
Acute		
Dermal		
LD50	Rabbit	12126 mg/kg, 24 Hours
Inhalation		
LC50	Rat	6350 ppm, 4 Hours
Oral		
LD50	Rat	3523 mg/kg
Benzene (CAS 71-43-2)		
Acute		
Oral		
LD50	Rat	930 mg/kg
Toluene (CAS 108-88-3)		
Acute		
Dermal		
LD50	Rabbit	14.1 ml/kg
Inhalation		
LC50	Rat	49000 mg/m³, 4 Hours
Oral		
LD50	Rat	636 mg/kg

Skin corrosion/irritation Causes skin irritation.

Serious eye damage/eye irritation Direct contact with eyes may cause temporary irritation.

Respiratory or skin sensitization

Respiratory sensitization Not a respiratory sensitizer.

Skin sensitization This product is not expected to cause skin sensitization.

Germ cell mutagenicity May cause genetic defects.

Carcinogenicity May cause cancer.

IARC Monographs. Overall Evaluation of Carcinogenicity

Benzene (CAS 71-43-2)	1 Carcinogenic to humans.
Toluene (CAS 108-88-3)	3 Not classifiable as to carcinogenicity to humans.
Xylene (CAS 1330-20-7)	3 Not classifiable as to carcinogenicity to humans.

NTP Report on Carcinogens

Benzene (CAS 71-43-2)	Known To Be Human Carcinogen.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Benzene (CAS 71-43-2)	Cancer

Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.
Specific target organ toxicity - single exposure	May cause drowsiness and dizziness.
Specific target organ toxicity - repeated exposure	Not classified.
Aspiration hazard	May be fatal if swallowed and enters airways.

12. Ecological information

Ecotoxicity Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

Constituents		Species	Test Results
Toluene (CAS 108-88-3)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	5.46 - 9.83 mg/l, 48 hours
Fish	LC50	Pink salmon (Oncorhynchus gorbuscha)	6.86 - 8.48 mg/l, 96 hours

Persistence and degradability	No data is available on the degradability of this product.
Bioaccumulative potential	Not available.
Mobility in soil	Expected to be slightly to moderately mobile in soil.
Other adverse effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

US RCRA Hazardous Waste U List: Reference

Benzene (CAS 71-43-2)	U019
Toluene (CAS 108-88-3)	U220
Xylene (CAS 1330-20-7)	U239

Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

UN number	UN1268
UN proper shipping name	Petroleum products, n.o.s. (naphtha, benzene)
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Label(s)	3
Packing group	II
Environmental hazards	
Marine pollutant	Yes
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Special provisions	144, IB2, T7, TP1, TP8, TP28
Packaging exceptions	150
Packaging non bulk	202
Packaging bulk	242

IATA

UN number	UN1268
UN proper shipping name	Petroleum products, n.o.s. (naphtha, benzene)

Transport hazard class(es)

Class	3
Subsidiary risk	-
Label(s)	3
Packing group	II
Environmental hazards	Yes
ERG Code	3H
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IMDG

UN number	UN1268
UN proper shipping name	PETROLEUM PRODUCTS, N.O.S. (naphtha, benzene)
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Label(s)	3
Packing group	II
Environmental hazards	
Marine pollutant	Yes
EmS	F-E, S-E
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not established.
General information	IMDG Regulated Marine Pollutant.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Benzene (CAS 71-43-2)	Cancer Central nervous system Blood Aspiration Skin Eye respiratory tract irritation Flammability

CERCLA Hazardous Substance List (40 CFR 302.4)

Benzene (CAS 71-43-2)	LISTED
Toluene (CAS 108-88-3)	LISTED
Xylene (CAS 1330-20-7)	LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - Yes
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Benzene	71-43-2	0 - 20
Xylene	1330-20-7	0 - 10

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Toluene	108-88-3	0 - 20

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Benzene (CAS 71-43-2)
Toluene (CAS 108-88-3)
Xylene (CAS 1330-20-7)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical Code Number

Toluene (CAS 108-88-3) 6594

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Toluene (CAS 108-88-3) 35 %WV

DEA Exempt Chemical Mixtures Code Number

Toluene (CAS 108-88-3) 594

US state regulations

US. Massachusetts RTK - Substance List

Benzene (CAS 71-43-2)
Toluene (CAS 108-88-3)
Xylene (CAS 1330-20-7)

US. New Jersey Worker and Community Right-to-Know Act

Benzene (CAS 71-43-2)
Toluene (CAS 108-88-3)
Xylene (CAS 1330-20-7)

US. Pennsylvania Worker and Community Right-to-Know Law

Benzene (CAS 71-43-2)
Toluene (CAS 108-88-3)
Xylene (CAS 1330-20-7)

US. Rhode Island RTK

Benzene (CAS 71-43-2)
Toluene (CAS 108-88-3)
Xylene (CAS 1330-20-7)

US. California Proposition 65

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Benzene (CAS 71-43-2)
Toluene (CAS 108-88-3)

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No

Country(s) or region	Inventory name	On inventory (yes/no)*
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 09-June-2015

Revision date -

Version # 01

HMIS® ratings Health: 2*
Flammability: 3
Physical hazard: 0

NFPA ratings



Disclaimer Philadelphia Energy Solutions cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.

Appendix D Well Construction and Boring Logs

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-428**
PAGE 1 OF 1

Stantec

DRILLING: STARTED **9/18/18** COMPLETED: **9/18/18**
INSTALLATION: STARTED **9/18/18** COMPLETED: **9/18/18**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon, Cuttings**

NORTHING (ft): **220253** EASTING (ft): **2682726**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **11.4** TOC ELEV (ft): **11**
INITIAL DTW (ft): **10.2** BOREHOLE DEPTH (ft): **26**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **4** BOREHOLE DIAMETER (in): **8**
LOGGED BY: **D Hopkins** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1			APPARENT FILL [brownish gray fine to coarse sand with some silt/clay/gravel and a trace of cobbles, brick at 3' +/- (moist to wet)]							4" PVC Casing
2										
3		SC	SC; APPARENT PLEISTOCENE ALLUVIUM [Varicolored (olive, pale olive and reddish brown) coarse to fine SAND, come coarse to fine gravel, little clay/silt (thin lenses some to and silt/clay) (gravels are heterogeneous and weathered) (wet; saturated by 10.2' +/-)]							
4										
5					1000			17	5	Bentonite
6										
7										Sand Pack #2 Well Sand
8										
9										
10					1000 S-428(10-10.7)		1	34	10	
11		GM	GM; Varicolored (olive, pale olive and reddish brown) coarse to fine GRAVEL, some to and fine to coarse sand, little silt/clay (few lenses and silt/clay) (gravels are highly weathered and heterogeneous) (saturated with wet lenses)		1000	0.7	6 9 11	33		
12					1000 S-428(12-13)		3 4 7	33		
13						1	10			
14		SW	SW; Olive brown to brownish yellow coarse to fine SAND, some pebble-size to medium gravel, trace silt/clay (stratified with few thin fine sand lenses and common silty gravel lenses) (saturated)		1000 S-428(14-15)		4	66		
15					1000	1	9 9 8	25	15	
16					1000 S-428(16-16.75)		16	4		
17						0.8	11 6 7			
18					1000 S-428(18-18.7)		3	0		4" SCH40 Slotted PVC Casing (0.020in slot size)
19		GM	GM; Yellowish brown coarse to fine GRAVEL, and to some fine to coarse sand, little silt/clay (gravels are heterogeneous, weathered, sub-angular to angular) (wet to saturated)		1000	0.7	1 8 9	0		
20					1000 S-428(20-20.7)		3 5	0	20	
21						0.7	20 25			
22					1000 S-428(22-23)		1	0.8		
23		CL	CL; APPARENT CRETACEOUS ALLUVIUM [Dark red to reddish brown and gray (laminated) SILT/CLAY, trace fine sand (moist)]			1	11 11			End Cap
24					1000		10	- -		
25						0	2 1 WH		25	
26			End of Boring				1			
27										
28										
29										

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-429**
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Stantec

DRILLING: STARTED **9/19/18** COMPLETED: **9/19/18**
INSTALLATION: STARTED **9/19/18** COMPLETED: **9/19/18**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon, Cuttings**

NORTHING (ft): **220526** EASTING (ft): **2682261**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **19.3** TOC ELEV (ft): **21.97**
INITIAL DTW (ft): **17.25** BOREHOLE DEPTH (ft): **28**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **4** BOREHOLE DIAMETER (in): **8**
LOGGED BY: **D Hopkins** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1			APPARENT FILL [well graded SAND/GRAVEL, some silt/clay, brick at 3' +/-] (dry-moist)							4" PVC Casing
2		CL	CL; APPARENT PLEISTOCENE ALLUVIUM [brownish yellow (reddish yellow mottles) clay/silt, trace fine sand (dry-moist)]							
3										
4										
5					1000				5	
6										
7										
8										
9										Bentonite Grout
10		SP	SP; Yellowish brown-brown fine to medium SAND, some rounded gravel (dry-moist)		1000 S-429(10-11.25)	1.25	8 12 13 13	45.6	10	
11										
12					1000 S-429(12-13.25)	1.25	7 25 16 17	80.3		
13										
14					1000 S-429(14-15.25)	1.25	7 14 20 20	246.1		
15		SPG	SPG; Brown to brownish yellow SAND/GRAVEL, trace silt/clay and weathered mudstone fragments at 17.25' +/- (saturated at 17.25)						15	
16					1000 S-429(16-17.25)	1.25	14 17 24 23	775.4		Sand Pack #2 Well Sand
17		SP	SP; Yellowish brown fine-medium SAND, some silt and sub-angular gravel (Cape May alluvium) (saturated)							
18					1000 S-429(18-19.15)	1.15	2 9 17 20	287.3		
19		SC	SC; Brown-brown silty well graded SAND and rounded gravel (saturated)							
20					1000 S-429(20-21)	1	2 6 8 7	947.2	20	4" SCH40 Slotted PVC Casing (0.020in slot size)
21		SP	SP; Brown fine-medium SAND, some gravel (reddish oxidation stains at 22.5' +/-) (saturated)							
22					1000 S-429(22-23.25)	1.25	2 3 8 7	338.2		
23										
24		SP	SP; Brown-brownish yellow well graded quartz SAND (Cretaceous alluvium) (laminations of varying color, fining with depth), some rounded gravel and weathered mudstone fragments (saturated)							
25					1000 S-429(24-25.5)	1.5	2 3 12 26	582.3	25	
26										
27					1000 S-429(26-27.5)	1.5	17 15 8 10	171.5		End Cap
28		CL	CL; Brown SILT/CLAY, some very fine sand (slightly micaceaous)							
29			End of Boring							

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

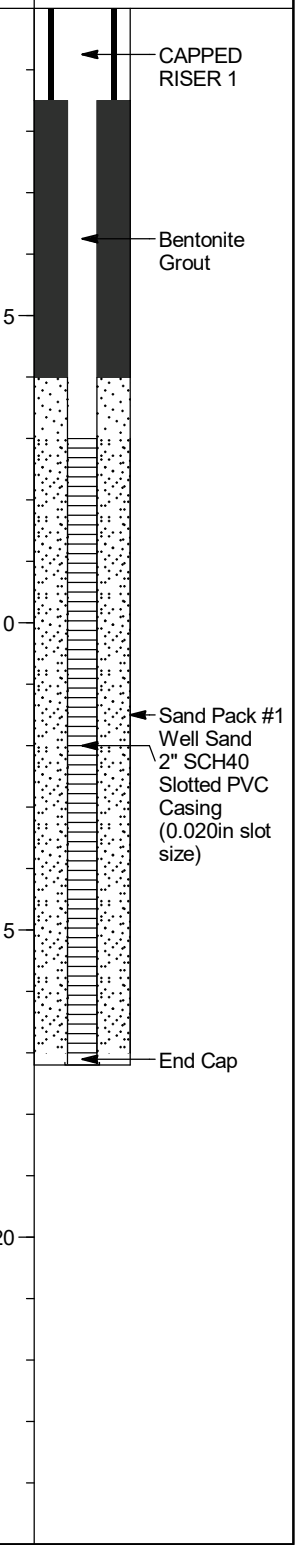
WELL / PROBEHOLE / BOREHOLE NO: **S-430**
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Stantec

DRILLING: STARTED **9/27/18** COMPLETED: **9/27/18**
INSTALLATION: STARTED **9/27/18** COMPLETED: **9/27/18**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Geoprobe 7822 DT**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **220761** EASTING (ft): **2682288**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **9.9** TOC ELEV (ft): **13.09**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **17**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in): **4**
LOGGED BY: **A Klingbeil** CHECKED BY: **J. Kachel**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			NO SAMPLING PERFORMED; WELL SET USING MIHPT-10 LOG							
17			End of Boring							



GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-431**
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Stantec

DRILLING: STARTED **9/27/18** COMPLETED: **9/27/18**
INSTALLATION: STARTED **9/27/18** COMPLETED: **9/27/18**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Geoprobe 7822 DT**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **220624** EASTING (ft): **2682232**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **14** TOC ELEV (ft): **17.52**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **18**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in): **4**
LOGGED BY: **A Klingbeil** CHECKED BY: **J. Kachel**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			NO SAMPLING PERFORMED; WELL SET USING MIHPT-11 LOG							
18			End of Boring							

Well Construction:
- CAPPED RISER 1
- Bentonite Grout
- Sand Pack #1 Well Sand
- 2" SCH40 Slotted PVC Casing (0.020in slot size)
- End Cap

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-432**
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Stantec

DRILLING: STARTED **8/23/18** COMPLETED: **8/23/18**
INSTALLATION: STARTED **8/23/18** COMPLETED: **8/23/18**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Geoprobe 7822 DT**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **220519** EASTING (ft): **2682256**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **19.2** TOC ELEV (ft): **22.02**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **24.5**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1.5** BOREHOLE DIAMETER (in): **4**
LOGGED BY: **A Klingbeil** CHECKED BY: **J. Kachel**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			NO SAMPLING PERFORMED; WELL SET USING MIHPT-08 LOG							
			End of Boring							

Well Construction:
- CAPPED RISER 1
- Bentonite Grout
- Sand Pack #1 Well Sand
- 1.5" SCH40 Slotted PVC Casing (0.020in slot size)
- End Cap

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-433**
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Stantec

DRILLING: STARTED **1/8/20** COMPLETED: **1/8/20**
INSTALLATION: STARTED **1/8/20** COMPLETED: **1/8/20**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon, Cuttings**

NORTHING (ft): **220033** EASTING (ft): **2682192**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **12.2** TOC ELEV (ft): **11.68**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **25**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **4** BOREHOLE DIAMETER (in): **8**
LOGGED BY: **A Klingbeil** CHECKED BY: **S. Kalita**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
0			APPARENT FILL [large cobble stones, bricks, debris with sandy clay/silt (wet)]		1115			0	0	4" PVC Casing; Bentonite and Grout
10		CL	CL; Gray to brownish gray CLAY/SILT, trace fine sand, trace fine to coarse gravel with depth (little organic material, roots) (slightly micaceaous) (trace wood) (moist to damp to dry with depth)		1115	1.8	1 1 2 2	0	10	
11		GM			1115	1.6	WOH/12" 2 5	0		
15			GM; Brownish gray fine to medium GRAVEL and fine to coarse SAND, trace silt (gravel is weathered and mulitcolored) (wet to saturated with depth)		1115	1.1	3 9 13 16	0	15	Sand Pack #1 Well Sand; 4" SCH40 Slotted PVC Casing (0.020in slot size)
19		SP-SM	SP-SM; Brownish gray medium to fine SAND, trace very coarse sand, trace fine gravel, trace to no silt (few gravel lenses) (saturated)		1115	1.3	18 11 9 8	0	20	
21					1115	1	22 12 12 11	0		
24					1115	1.3	7 4 7 10	0	25	End Cap
25			End of Boring							
30									30	
35									35	

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-434**
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Stantec

DRILLING: STARTED **1/7/20** COMPLETED: **1/7/20**
INSTALLATION: STARTED **1/7/20** COMPLETED: **1/7/20**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon, Cuttings**

NORTHING (ft): **219597** EASTING (ft): **2682610**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **10.9** TOC ELEV (ft): **13.1**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **20**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **4** BOREHOLE DIAMETER (in): **8**
LOGGED BY: **A Klingbeil** CHECKED BY: **S Kalita**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1–3			APPARENT FILL [crushed stone underlain by an asphalt layer and stone base]							CAPPED RISER 1
3–8		SM	SM; SAND (dark brown medium-fine to coarse), silt (trace), gravel (little, very coarse to coarse, multicolored), cobbles (trace) (moist)		1000			0		Bentonite and Grout
8–9		CL	CL; CLAY/SILT (reddish yellow), sand (little, fine to coarse), gravel (trace, fine to medium) (strong brown mottles) (damp)		1000		6	0		
9–10		GW-GM	GW-GM; GRAVEL (varicolored coarse to fine), sand (little to some coarse to fine), silt (trace to none) (heterogenous) (damp to moist)		1000	1.2	9	0		
10–11					1000		5	0	10	
11–12		SC			1000	1.5	15	0		
12–13			SC; SAND (light reddish brown to strong brown medium to fine), sand (little, very coarse), clay (trace), gravel (trace, fine with coarse sand) (wet)		1000		3	0		
13–15		GM	GM; SAA (and coarse gravel) (saturated)			0.1	5	0		Sand Pack #1 Well Sand
15–16							4			
16–18		SM	SM; SAND (light brown fine to medium), sand (little to some coarse), gravel (trace, fine to coarse), silt (little to some) (gravel at lower contact) (saturated)		1000		6			
18–19					1000		10	0		
19–20		SC	SC; SAND (light brown-pink- reddish yellow, laminated to finely bedded, fine to very fine), silt (little to none) (finely laminated with clay/silt) (slightly micaceous) (saturated)			1.5	26	0		
20			End of Boring				26		20	End Cap
							32			
							4	0		
							2			
							3	0		
							4			

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-435**
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Stantec

DRILLING: STARTED **1/7/20** COMPLETED: **1/8/20**
INSTALLATION: STARTED **1/8/20** COMPLETED: **1/8/20**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon, Cuttings**

NORTHING (ft): **219886** EASTING (ft): **2682591**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **13.2** TOC ELEV (ft): **15.15**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **25**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **4** BOREHOLE DIAMETER (in): **8**
LOGGED BY: **A Klingbeil** CHECKED BY: **S Kalita**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)
0–4			APPARENT FILL [brownish yellow clay/silt, gravel and sand (damp)]		1100			0
4–8		CL	CL; CLAY/SILT (yellowish brown), sand (trace, fine) (red sandstone gravel at contact) (damp)		1100		4	0
8–13		SW-SM	SW-SM; SAND (white to light gray, coarse), sand (little, very coarse), gravel (trace to little, fine to coarse, heterogeneous), silt (trace to none) (reddish yellow color, cementation @ 13-13.1') (dry)		1100	1.3	8 8 9	0
					1100	0.6	2 6 8 11	0
13–15		GW-GM	GW-GM; GRAVEL (white to varicolored) and SAND (coarse to fine), silt (trace to none) (saturated)		1100	0.7	3 2 6 12	0
15–22		SPG	SPG; SAND (brownish gray, coarse to fine), sand (little, very coarse), gravel (some medium to coarse to fine, heterogeneous), silt (trace to none) (saturated)		1100	0.7	WOH 1 2 4	0
22–25		CL	CL; CLAY/SILT (gray/pink to reddish yellow, laminated to thinnly bedded), few sand lenses (fine, slightly micaceaous) (lignite, trace in shoe) (wet to saturated)		1100	1.6	2 2 1 1	0
25			End of Boring					

Depth (feet): 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

Well Construction:
- 4" PVC Casing
- Bentonite and Grout
- Sand Pack #1 Well Sand
- 4" SCH40 Slotted PVC Casing (0.020in slot size)
- End Cap

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-436**
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Stantec

DRILLING: STARTED **1/6/20** COMPLETED: **1/7/20**
INSTALLATION: STARTED **1/7/20** COMPLETED: **1/7/20**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon, Cuttings**

NORTHING (ft): **219691** EASTING (ft): **2682814**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **11.7** TOC ELEV (ft): **13.9**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **22**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **4** BOREHOLE DIAMETER (in): **8**
LOGGED BY: **A Klingbeil** CHECKED BY: **S Kalita**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)
0			APPARENT FILL [crushed stone/asphalt (water seepage)]		1430			0
9		SC	SC; SAND (strong brown to reddish yellow, coarse to fine), gravel (trace, fine), silt/clay (some) (moist)		1430	1.2	1 1 3 4	0 0
10		SWG	SWG; SAND (varicolored, very coarse to fine), gravel (some to and fine to coarse), silt (trace) (dark olive brown staining with depth) (moist; wet at 11.2' and saturated by 13' bgs +/-)		1430	1.3	9 12 13 12	0
14					1430	1	WOH/12" 4 11	0
18		SC	SC; CLAY/SILT (light brownish gray) and SAND (fine to medium), sand (trace, coarse) (sandy lenses with trace fine gravel) (saturated)		1430	0.3	8 6 5 6	0
20		SM	SM; SAND (light olive gray, fine to very fine), silt (trace) (clay/silt laminations) (saturated)		1430	1.2	1 2 3 4	1
22			End of Boring					

Depth (feet): 5, 10, 15, 20, 25, 30, 35

Well Construction:
- 4" PVC Casing
- Bentonite and Grout
- Sand Pack #1 Well Sand
- 4" SCH40 Slotted PVC Casing (0.020in slot size)
- End Cap

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-437**
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Stantec

DRILLING: STARTED **1/9/20** COMPLETED: **1/9/20**
INSTALLATION: STARTED **1/9/20** COMPLETED: **1/9/20**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon, Cuttings**

NORTHING (ft): **220471** EASTING (ft): **2682425**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **18.5** TOC ELEV (ft): **20.85**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **30**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **4** BOREHOLE DIAMETER (in): **8**
LOGGED BY: **D Hoblitzell** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
0–4			APPARENT FILL [well graded SAND/GRAVEL, some silt/clay, bricks, and trace cobbles, +/- 6" asphalt layer at 4.5' +/- bgs (dry-moist)]		1000			3		4" PVC Casing
4–13		SP-SM	SP-SM; Brownish yellow fine-medium SAND, some subrounded/rounded gravel (moist)		1000 1000	0.8	8 9 3 5	0 0	5 10	Bentonite and Grout
13–15		GM	GM; Dark yellowish brown GRAVEL, some silt (multicolored) (moist)		1000	1.5	6 10 12 3	1		Sand Pack #2 Well Sand 4" SCH40 Slotted PVC Casing (0.020in slot size)
15–22		SM	SM; Strong brown coarse-fine SAND, some silt, some sub-rounded gravel (moist to saturated)		1000	1.3	12 18 20 22	1999	15 20	
22–27		SC	SC; Dark brown fine-medium SAND, some silt/clay, trace sub-rounded gravel (slightly micaceous) (saturated to wet)		1000	0.8 0.7	5 18 21 17 4 6 12 8	1999	25	
27–30		SW	SW; Brown-brownish yellow fine quartz SAND, trace silt (saturated)		1000	1.2	8	1999	30	End Cap
30			End of Boring							

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-438**
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Stantec

DRILLING: STARTED **1/10/20** COMPLETED: **1/10/20**
INSTALLATION: STARTED **1/10/20** COMPLETED: **1/10/20**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Cuttings**

NORTHING (ft): **220484** EASTING (ft): **2682240**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **18.7** TOC ELEV (ft): **21.26**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **25.5**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **4** BOREHOLE DIAMETER (in): **8**
LOGGED BY: **A Klingbeil** CHECKED BY: **S Kalita**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1–39			NO SAMPLING PERFORMED; WELL SET USING UVHP-06 LOG						5, 10, 15, 20, 25, 30, 35	CAPPED RISER 1; Bentonite Grout; Sand Pack #1 Well Sand; 4" SCH40 Slotted PVC Casing (0.020in slot size); End Cap
25			End of Boring							

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-439**
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Stantec

DRILLING: STARTED **1/14/20** COMPLETED: **1/14/20**
INSTALLATION: STARTED **1/14/20** COMPLETED: **1/14/20**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon, Cuttings**

NORTHING (ft): **220607** EASTING (ft): **2682531**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **20** TOC ELEV (ft): **22.55**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **30**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **4** BOREHOLE DIAMETER (in): **8**
LOGGED BY: **A Klingbeil** CHECKED BY: **S Kalita**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1–3			APPARENT FILL [crushed stone, some silt/clay (dry)]							CAPPED RISER 1
4–7		SC	SC; AUGER CUTTINGS [muddy sand, some gravel (dry)]							Bentonite and Grout
8–9		GW-GM	GW-GM; GRAVEL (varicolored, fine to coarse, highly weathered), sand (and to some, very coarse to fine), silt (trace to none) (dry to damp; saturated by 23' bgs)			1	3 9 11 13	0		
10–11						0.8	3 5 12 15	240	10	
12–14						1.4	6 16 21 19	295		Sand Pack #1 Well Sand
15–19						1.1	4 15 20 19	189	15	
20–24						0.8	8 5 10 8	108	20	
25–27		GM	GM; SAA (little silt) (few lenses of coarse sand) (wet to saturated)						25	
28–30						1	2 11 16 23	10 9	30	End Cap
31–32		CL	CL; SILT/CLAY (pinkish gray to reddish yellow, laminated), gravel (trace, fine), sand (some to little, fine) (moist)			1.7	16 15 13 15	0		
33			End of Boring							
35									35	

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-479**
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Stantec

DRILLING: STARTED **12/21/21** COMPLETED: **12/21/21**
INSTALLATION: STARTED **12/21/21** COMPLETED: **12/21/21**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Geoprobe 7822 DT**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Direct Push Macrocore**

NORTHING (ft): **220479** EASTING (ft): **26821250**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **15.8** TOC ELEV (ft): **15.51**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **35**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1.5** BOREHOLE DIAMETER (in): **2**
LOGGED BY: **D Hopkins** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1–12			FILL (brick), sand (very dark gray-dark red brown, silty, fine to medium) (dry to moist)			1		0		1.5" PVC Casing
13–18		SC	SC; SAND (very dark gray to dark red brown, silty, fine to medium), clay (little, some fine grained, dark staining) (wet)			3		0 48 50 250 2430	5 10 15	Bentonite and Grout 1.5" SCH40 Slotted PVC Casing (0.020in slot size) Sand Pack #2 Well Sand
19–20		SP	SP; SAND (dark red brown, poorly graded) (slight staining) (saturated)			3.5		5		
20–22		SW	SW; SAND (dark red brown, well graded), gravel (small) (trace fine grain sediments)					1.9	20	End Cap
22–25		SC	SC; SAND (gray, clayey, fine to very fine)			4.5		32.7 5.1	25	
25–30		CL	CL; SAND (gray to light gray, clayey, fine to very fine), transitioning to clay (sandy, finer to very fine) (saturated)			3		0	30	
30–35		SP	SP; SAND (red brown, poorly graded, very fine) (micaceous, trace fine grain sediments) (saturated)			5		0	35	
35		SC	SC; SAND (very dark brown, clayey, very fine) (saturated) End of Boring							

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-480**
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Stantec

DRILLING: STARTED **12/16/21** COMPLETED: **12/16/21**
INSTALLATION: STARTED **12/16/21** COMPLETED: **12/16/21**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Geoprobe 7822 DT**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **Macrocore Discrete**

NORTHING (ft): **220561** EASTING (ft): **2682726**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **18.9** TOC ELEV (ft): **18.71**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **34**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1.5** BOREHOLE DIAMETER (in): **2**
LOGGED BY: **J Kachel/A Wright** CHECKED BY: **S Kalita**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
0–5			APPARENT FILL [gravel road bed, sandy clay/silt with glass fragments (dry)]		1410			0		1.5" PVC Casing
					1410	3.5		0.2		
					1410			1.5		
5–10		GW	GW; GRAVEL (varicolored, weathered) (3" diameter in last 6 to 8 inches) (dry)		1410			0	5	Bentonite and Grout
					1410			0		
					1410	4		0		
					1410			0		
10–15		CL	CL; CLAY/SILT (gray to bluish gray), gravel (fine to medium, subrounded) (dry)						10	1.5" SCH40 Slotted PVC Casing (0.020in slot size) Sand Pack #2 Well Sand
					1410	4		0.6		
					1410			0.6		
15–20		SP	SP; SAND (brown medium), gravel (trace, fine) (damp)		1410			170	15	
		GW-GM	GW-GM; GRAVEL (varicolored), sand (some fine to coarse) (wet @ 18' bgs)		1410			150		
					1410	3.7		780		
					1410			400		
20–25		SPG	SPG; SAND (brown medium to coarse), and gravel (fine to coarse, rounded to subrounded) (few fines) (saturated)						20	End Cap
						0.5				
									25	
						0				
30–35									30	
		CL	CL; CLAY/SILT (inferred from CD-03 HPT log)		1410	3.5		1		
35–39			End of Boring						35	

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-481**
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Stantec

DRILLING: STARTED **12/20/21** COMPLETED: **12/20/21**
INSTALLATION: STARTED **12/20/21** COMPLETED: **12/20/21**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Geoprobe**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **Macrocore Discrete**

NORTHING (ft): **220288** EASTING (ft): **2682196**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **16.8** TOC ELEV (ft): **16.52**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **35**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1.5** BOREHOLE DIAMETER (in): **2**
LOGGED BY: **A Wright** CHECKED BY: **S Kalita**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1			CLAY (brown, silty, low plasticity), gravel (abundant) (debris)					0		
2			SAND (dark gray, fine to medium), gravel (abundant) (cobbles) (debris)					1.2		
3		CL	CL; CLAY (brown, silty, dense) (low plasticity)			5		0		
4		SW	SW; SAND (light brown to brown, medium), gravel (and cobbles) (becomes more fine at the bottom)					0		
5		SP						0	5	
6			SP; SAND (red brown, very fine) (no gravel) (well sorted) (bottom 2 inches more gray-brown)					0		
7		CL	CL; CLAY (dense brown, compacted) (low plasticity)					0		
8		SW	SW; SAND (light to dark brown, fine to medium) (no gravel) (sand vanes in color)			3.5		0		
9		GP						0		
10		CL	GP; GRAVEL (sandy), gravel (multicolored and cobbles) (becomes more sandy in bottom 4 inches)					0	10	
11		CL						0.2		
12			CL; CLAY (brown, silty) (low plasticity)					0		
13		SP	CL; CLAY (brown, sandy), gravel (some, small) (low plasticity)			3.5		7		
14			SP; SAND (light brown to brown to red brown, medium), gravel (multicolored, abundant, with cobbles) (moist)					30		
15		SP						316	15	
16			SP; SAND (red brown to dark brown, coarse, with gravel)					3300		
17		CL	CL; CLAY (brown, silty, with gravel)					4035		
18		SP	SP; SAND (red brown, medium), gravel (some) (saturated)			5		3800		
19										
20			No Recovery						20	
21										
22										
23										
24										
25									25	
26										
27										
28						0				
29										
30									30	
31										
32										
33										
34										
35			End of Boring						35	
36										
37										
38										
39										

Well Construction:
- 1.5" PVC Casing
- Bentonite and Grout
- 1.5" SCH40 Slotted PVC Casing (0.020in slot size)
- Sand Pack #2 Well Sand
- End Cap

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-482**
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Stantec

DRILLING: STARTED **12/17/21** COMPLETED: **12/17/21**
INSTALLATION: STARTED **12/17/21** COMPLETED: **12/17/21**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Geoprobe 7822 DT**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **Macrocore Discrete**

NORTHING (ft): **220640** EASTING (ft): **2682302**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **19.8** TOC ELEV (ft): **19.53**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **40**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1.5** BOREHOLE DIAMETER (in): **2**
LOGGED BY: **A Wright** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	USCS	Description	Measured Recov. (feet)	Headspace PID (units)
1	CL	CL; CLAY (brown, moist), silt (some) (low plasticity)		0
2				0
3			3.17	
4				
5	CL	CL; CLAY (brown, moist), silt (some) (low plasticity)		
6				0
7				0
8	SW	SW; SAND (brown, medium), gravel (multicolored) (mudstones, green and red stones) (sand becomes more fine and gravel less prevalent in bottom 6 inches of sleeve) (top 12 inches coarser angular sand with larger gravel and fragments)	3.34	0
9				0
10	SM			0
11				
12		SM; SAND (brown, fine), silt (some) (compacted) (moist)		0
13			2.5	
14	SP	SP; SAND (light brown, medium), gravel (with cobbles) (poorly sorted, bottom 12 inches contain red brown clayey sand, some gravel of varying sizes)		30
15	SP			18
16	SP	SP; SAND (gray brown, medium to fine), gravel (some, with pebbles)		22
17				11
18		SP; SAND (red brown, medium), gravel (multicolored) (cobbles, scapolite and mudstones present)	4	29
19				1400
20	SP	SP; SAND (reddish brown, medium), silt (some), gravel, (saturated)		3800
21				
22				600
23	SP	SP; SAND (dark brown to black stained, medium), gravel, (saturated)	5	350
24	SW	SW; SAND (brown, medium to fine), gravel (and pebbles small pieces throughout, becomes less prevalent in bottom 12 inches) (bottom 12 inches show gradient to reddish brown colors)		390
25	SM			800
26		SM; SAND (brown, medium), gravel (little with pebbles), silt (very little) (saturated)		4200
27				16
28	SP	SP; SAND (white/light brown/red brown, medium), gravel (with many cobbles) (crushed mudstones) (green stones)	5	35
29	CL			
30	MH	CL; CLAY (gray, low plasticity), sand (gray clayey in bottom 4 inches and transitioning to red brown), clay (in bottom 2 inches, high plasticity)		0
31	CL			0
32				
33		MH; SILT (brown), sand (fine) (saturated)	5	
34		CL; CLAY (gray sandy), silt (little) (saturated)		
35	SC	SC; SAND (brown clayey, very fine), gravel (very little) (saturated)		4
36	SP	SP; SAND (dark brown, fine) (no gravel) (saturated)		5
37				7
38			5	4
39				
40		End of Boring		
41				

Well Construction:
- 1.5" PVC Casing
- Bentonite and Grout
- 1.5" SCH40 Slotted PVC Casing (0.020in slot size)
- Sand Pack #2 Well Sand
- End Cap

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-483**
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Stantec

DRILLING: STARTED **12/20/21** COMPLETED: **12/20/21**
INSTALLATION: STARTED **12/20/21** COMPLETED: **12/20/21**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Geoprobe**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **Macrocore Discrete**

NORTHING (ft): **219859** EASTING (ft): **2682455**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **12.8** TOC ELEV (ft): **12.44**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **35**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1.5** BOREHOLE DIAMETER (in): **2**
LOGGED BY: **A Wright** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1			FILL (asphalt dust or debris in top few inches)					0		4" PVC Casing
2										
3		CL	CL; CLAY (brown), silt (some) (low plasticity)			2.5		0		
4		SP	(micaceous) (moist)					25		
5		SP	SP; SAND (dark gray stained, medium, some cobbles), gravel (small), sand (in bottom 2 inches, dry, tan or light brownish yellow, fine), gravel (with cobbles)					19 3.4	5	Bentonite and Grout
6										
7		SP	SP; SAND (dark gray stained, medium), gravel (with cobbles)					5.0 0		
8		SP	SP; SAND (light brown, medium), gravel (variable sized) (moist)			3.34		6.5 0		
9										
10		SP	SP; SAND (brown orange, medium), gravel (variable sized) (distinct color from sand above although similar texture)					11	10	Sand Pack #2 Well Sand
11								370		
12			SP; SAND (orangish brown, medium), gravel (variable sized) (color change around 12.5 ft)					4200		
13		SP	(moist)			2.5		140		
14		CL	SP; SAND (brown, gravelly), silt (some) (saturated)					45 30		
15		CH	CL; CLAY (light gray, sandy, fine) (saturated) CH; CLAY (light gray, silty) (high plasticity)					1.2	15	
16										
17		GW	GW; GRAVEL (multicolored in top 6 inches with mudstones in medium sand matrix), sand (brown medium with small gravels)					0		
18						2.92		4.7 0		
19										
20		SW	SW; SAND (brown, medium to coarse), gravel (some, with pebbles in bottom 6 inches) (saturated)					5	20	End Cap
21								0		
22										
23		SP	SP; SAND (red brown, medium), gravel (abundant with cobbles), silt (some) (saturated)			-		0 0		
24										
25		CL	CL; CLAY (brown, sandy), gravels (some) (saturated)					0	25	
26		SM						0		
27		CH	SM; SAND (brown, silty, fine, becomes more coarse in bottom 4 inches) (saturated) CH; CLAY (brown, high plasticity) (saturated)			5		0		
28										
29										
30		CH	CH; CLAY (brown, high plasticity, bottom 1 inch gradient transition into gray clay, same properties) (saturated)					0	30	
31										
32										
33		SP	SP; SAND (dark red to brown, medium)			-		0		
34		SC	SC; SAND (brown clayey, fine, multiple lithologies) sand (orange-yellow, inter coarse)					0 0		
35		CL	(brown clayey sand media to light brown sand, coarse, having brown to gray or white colors)					0	35	
36			CL; CLAY (brown, sandy)							
37			End of Boring							
38										
39										

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-484**
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Stantec

DRILLING: STARTED **12/21/21** COMPLETED: **12/21/21**
INSTALLATION: STARTED **12/21/21** COMPLETED: **12/21/21**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted IR**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Direct Push Macrocore**

NORTHING (ft): **220459** EASTING (ft): **2682317**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **18** TOC ELEV (ft): **17.67**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **30**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **4** BOREHOLE DIAMETER (in): **8**
LOGGED BY: **D Hopkins** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
0								0		
1			SAND (light red brown to white to dark red brown, silty, fine), gravel (quartz, fill), clay (trace) (asphalt at 3 ft bgs) (dry to moist)							4" PVC Casing
2										
3						4.2				
4								5.96		
5		SP	SP; SAND (light red brown to red brown, poorly graded, very fine), gravel (at 6 ft bgs) (dry to moist)					53.4	5	
6										
7										
8						3				
9										
10			(unable to remove sleeve from barrell)						10	4" SCH40 Slotted PVC Casing (0.020in slot size) Bentonite and Grout
11										
12										
13						-				
14										
15		SW	SW; SAND (pale brown to brown yellow to weak red, well graded), gravel (quartz) (dry to moist)					1250	15	
16										
17										
18						4				
19		SW	SW; SAND (weak red clayey, well graded) (moist)					3000		
20		SW						4200	20	
21		SW	SW; SAND (yellow red, fine to medium) (moist to wet)					750		
22			SW; SAND (yellow brown to brown yellow, well graded), gravels (small with rounded quartz) (saturated)					150		Sand Pack #2 Well Sand
23						3				
24								125		
25		SW	SW; SAND (yellow brown, well graded, trace fines) (saturated)					35	25	End Cap
26										
27										
28		SW	SW; SAND (yellow brown, well graded, clayey), gravel, (saturated)			4.5		61		
29										
30		CL	CL; SAND (gray/white/olive/weak red, well graded, muddy), clay (weak red to light brown gray, sandy at 29.8 to 30 ft bgs) (saturated to wet)						30	
31			End of Boring							
32										
33										
34										
35									35	
36										
37										
38										
39										

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-485**
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Stantec

DRILLING: STARTED **12/21/21** COMPLETED: **12/21/21**
INSTALLATION: STARTED **12/21/21** COMPLETED: **12/21/21**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME**
DRILLING METHOD: **HSA; SPLIT SPOON**
SAMPLING EQUIPMENT: **Split Spoon, Cuttings**

NORTHING (ft): **220160** EASTING (ft): **2682448**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **15.8** TOC ELEV (ft): **15.44**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **24**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **4** BOREHOLE DIAMETER (in): **8**
LOGGED BY: **D Hopkins** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
0			APPARENT FILL						0	4" PVC Casing
5			SILT (light brown, sandy) (drilled without spoon recovery)						5	Bentonite and Grout
10		SW	SW; SAND (red brown, silty, well graded, concrete fragments) (dry)			1	7 12 20 27	66.1	10	4" SCH40 Slotted PVC Casing (0.020in slot size)
15		SW	SW; SAND (red brown to yellow brown, silty, well graded), gravels (small) (concrete fragments) (dry)			1.5	8 14 18 18	1999.9	15	Sand Pack #2 Well Sand
20		SW	SW; SAND (red brown, silty, well graded), gravel, (wet, saturated)			0.5	5 7 9	680.2	20	
22		SW	SW; SAND (red brown to yellow brown, silty, well graded, gravel (some, small) (saturated)			2	2 7 11 14	24.1		End Cap
24			End of Boring				3		25	
25									30	
30									35	
35										

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-507**
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Stantec

DRILLING: STARTED **6/27/23** COMPLETED: **6/28/23**
INSTALLATION: STARTED **6/28/23** COMPLETED: **6/28/23**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Boart Longyear LS250**
DRILLING METHOD: **Rotosonic**
SAMPLING EQUIPMENT: **4" Sonic Core Barrel**

NORTHING (ft): **219984** EASTING (ft): **2682403**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **11.69** TOC ELEV (ft): **11.3**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **75**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in): **6**
LOGGED BY: **A. Wright** CHECKED BY: **J. Kachel**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1			Gray SILT with GRAVEL, varied size, cobbles, asphalt FILL					18		2" PVC Casing
3		CL	CL; Brown SILTY CLAY, micaceous, moist					27		
4		SP	SP; Brwon fine SAND with GRAVEL					12		
		CL	CL; Brown SILTY CLAY with GRAVEL, medium plasticity, moist					15	5	
6		SP	SP; Light brown fine SAND with GRAVEL, varied size, cobbles					17		
		SP	SP; Yellowish brown, fine SAND with GRAVEL, multicoloted mudstones, becomes less sandy and more silty with depth					22		
8								18		
9			Lens of CLAY with SILT					20		
10		CL	CL; Brown SILTY CLAY, laminated with light brown sitly clay, wet					648	10	
11		SP	SP; Brown GRAVELLY SAND, fine to medium, little fines, gravels multicolored, rounded					1785		
12								1133		
13			Color becomes desaturated to grayish brown, silt content increasing with depth, saturated					58		
14								64		
15		SP	SP; Brown GRAVELLY SAND, fine and SILT, wet, micaceous					24	15	
16			Small to large cobbles							
17			Becomes medium to coarse					16		
18						5		94		
19		SP	SP; Grayish brown, fine to medium SAND with trace gravel, little silt, wet, color change to yellowish brown at 24.5' and increase in gravel, saturated					32		
20									20	
21								59		
22										
23						5		13		
24								249		
25		SP	SP; Brown, fine SAND with some gravel, wet					172	25	
26		CL	CL; Yellowish brown CLAY with some silt, medium plasticity, plasticity increases with depth					22		
27		SM	SM; Yellowish brown SILTY SAND, medium with trace small gravels, some coarse sand, silt content decreases and color change to stronger eyllowish brown.					0.1		Bentonite
28						5		0.1		
29			3" lens of SILTY CLAY							

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-507**
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Stantec

DRILLING: STARTED **6/27/23** COMPLETED: **6/28/23**
INSTALLATION: STARTED **6/28/23** COMPLETED: **6/28/23**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Boart Longyear LS250**
DRILLING METHOD: **Rotosonic**
SAMPLING EQUIPMENT: **4" Sonic Core Barrel**

NORTHING (ft): **219984** EASTING (ft): **2682403**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **11.69** TOC ELEV (ft): **11.3**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **75**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in): **6**
LOGGED BY: **A. Wright** CHECKED BY: **J. Kachel**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
31		CH	CH; Yellowish brown SILTY CLAY, medium to high plasticity, moist					0.1		
		SP	SP; Yellowish brown, fine SAND with some silt, trace small gravel					0		
32								0		
		CH	CH; Brown to dark greenish-gray, high plasticity CLAY, stark change from yellowish brown to gray at 33'			5				
33										
34								0		
35		SM	SM; 3" Yellowish brown, fine SAND, top 2" silty					0	35	
		CH	CH; 3" Dark greenish gray, high plasticity CLAY							
36		SM	SM; 3" Light gray, very fine SAND with some silt, very micaceous					0		
		CH	CH; 2" Light gray, high plasticity CLAY with fine sand					0		
37		GM	GM; 2" Yellowish brown COBBLES with fine sand and sitl, wet			5				
		SM	SM; 1" Light gray. very fine SAND with some silt, slightly micaceous					0		
38		CH	CH; 5" Dark greenish gray, high plasticity CLAY, bottom 2" yellowish brown							
		SP	SP; Light brown, very fine SAND with SILT, silt content decreases with depth, none present at bottom					0		
39		SP	SP; Yellowish brown, medium SAND with some angular gravels, wet							
		SP	SP; Yellowish brown, very coarse SAND with GRAVEL, little silt			5				
40		SP	SP; Reddish brown, fine to medium SAND, some coarse sand					0	40	
		SP	SP; Dark reddish brown, fine SAND with some medium sand, micaceous, some gravels and trace cobbles, becomes more gravelly and finer sand with depth					0		
41								0		
								0		
42						5				
								0		
43								0		
								0		
44								0		
								0		
45								0	45	
		GP	GP; COBBLES and rounded GRAVEL			5		0		Sand Pack #2 Well Sand
46		SP	SP; Reddish brown, gravelly, fine SAND, gravels multicolored, colorful, wet, becomes more gravelly, size increase with depth. Large cobbles present bottom 1"					0		
								0		
47								0		
								0		
48								0		
								0		
49								0		
								0		
50								0	50	
								0		
51								0		
								0		
52								0		
		SP	SP; Strong brown SILTY SAND, fine to medium, with gravel, colorul, rounded, some caorse sand, angular, large cobbles (5") at 58', saturated			3		0	55	
53								0		
								0		
54								0		
								0		
55								0		
								0		
56								0		
								0		
57								0		
								0		
58		SM	SM; Light brown SILTY SAND with GRAVEL and COBBLES, damp, multicolor round gravel, sand is fine 15%, gravel					0		
59										

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
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Stantec

DRILLING: STARTED **6/27/23** COMPLETED: **6/28/23**
INSTALLATION: STARTED **6/28/23** COMPLETED: **6/28/23**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Boart Longyear LS250**
DRILLING METHOD: **Rotosonic**
SAMPLING EQUIPMENT: **4" Sonic Core Barrel**

NORTHING (ft): **219984** EASTING (ft): **2682403**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **11.69** TOC ELEV (ft): **11.3**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **75**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in): **6**
LOGGED BY: **A. Wright** CHECKED BY: **J. Kachel**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
61		SM							65	2" SCH40 Slotted PVC Casing (0.020in slot size)
62										
63										
64										
65										
66										
67										
68			Yellow-gray SILTY SAND, weathered bedrock with high concentration of mica, compact, damp					0		End Cap
69										
70			Light gray CLAYEY SILT, weathered bedrock, damp with high concentration fo mica flakes					0	70	
71										
72										
73										
74										
75			End of boring						75	
76										
77										
78										
79										
80									80	
81										
82										
83										
84										
85									85	
86										
87										
88										
89										

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-508**
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Stantec

DRILLING: STARTED **6/29/23** COMPLETED: **6/30/23**
INSTALLATION: STARTED **6/30/23** COMPLETED: **6/30/23**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Boart Longyear LS250**
DRILLING METHOD: **Rotosonic**
SAMPLING EQUIPMENT: **4" Sonic Core Barrel**

NORTHING (ft): **220466** EASTING (ft): **2682318**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **15.74** TOC ELEV (ft): **15.31**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **97**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in): **6**
LOGGED BY: **T. Lee** CHECKED BY: **J. Kachel**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1			APPARENT FILL: dark brown/black, dry CLAY with a few angular gravel					1.7		2" PVC Casing
3			Same as above dark black, dry, angular GRAVEL					0		
4		SP	Same as above light gray, damp, angular GRAVEL with fine grain sand					0		
5		GP	SP; Brown, compact, damp, fine grain SAND GP; Brown gray, dry, angular GRAVEL in medium to coarse SAND					0	5	
6		GP	GP; Dark brown, coarse to fine GRAVEL SAND, round multicolor gravel and cobbles					0		
8		SP	SP; Red brown, damp, fine grain SAND					0		
9		SP	SP; Light brown, damp, fine grain SAND with angular GRAVEL					0		
10		GP	GP; Red/brown, damp SANDY GRAVEL iwth multicolor rounded gravel and coarse to fine sand					0	10	
15		GP	GP; Very dense same as above and dry					0		
		SW	SW; Red/brown, damp, coarse to fine, rounded GRAVEL/SAND					30 2286	15	
20		SP	SP; Yellow/brown, damp, medium to fine 20% GRAVELLY SAND, rounded multicolor gravel					2035	20	
22								3145		

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:

S-508

Stantec

DRILLING: STARTED **6/29/23** COMPLETED: **6/30/23**
INSTALLATION: STARTED **6/30/23** COMPLETED: **6/30/23**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Boart Longyear LS250**
DRILLING METHOD: **Rotosonic**
SAMPLING EQUIPMENT: **4" Sonic Core Barrel**

NORTHING (ft): **220466** EASTING (ft): **2682318**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **15.74** TOC ELEV (ft): **15.31**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **97**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in): **6**
LOGGED BY: **T. Lee** CHECKED BY: **J. Kachel**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
26		SP	SP; Dark brown, fine to coarse GRAVELLY SAND, sand round gravel multicolor with cobbles at 29.5 to 30'					30		
27										
28										
29										
30		SP	SP; Same as above with some red grain sand					4.6	30	
31		CL	CL; Red and brown SANDY CLAY with few mica flakes, well hydrated, low plasticity					25		
32		CL	CL; ???? (notes say Grace - maybe should be Gray) SANDY CLAY with mica flakes and low plasticity					35		
33										
34		SP	SP; Gray, coarse to medium grain SAND with mica flakes and some clay					3		
35		CL	CL; Gray SANDY CLAY with vains of multicolor, fine SAND at 35.2' to 35.7' and 37.5' to 37.7'					87	35	
36								420		Bentonite
37								60		
38								132		
39										
40		SC	SC; Light brown tan SAND with some clay, fine grain sand saturated					6	40	
41										
42										
43										
44										
45		SP	SP; Damp, brown tan, fine grain SAND					0	45	
46										
47										
48										
49										

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-508**
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Stantec

DRILLING: STARTED **6/29/23** COMPLETED: **6/30/23**
INSTALLATION: STARTED **6/30/23** COMPLETED: **6/30/23**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Boart Longyear LS250**
DRILLING METHOD: **Rotosonic**
SAMPLING EQUIPMENT: **4" Sonic Core Barrel**

NORTHING (ft): **220466** EASTING (ft): **2682318**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **15.74** TOC ELEV (ft): **15.31**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **97**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in): **6**
LOGGED BY: **T. Lee** CHECKED BY: **J. Kachel**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
50		SP	SP; Fine grain SAND, orange brown					0		
51										
52										
53										
54										
55		SP-SM / GP	SP-SM; Gray, fine grain SAND with some silt GP; Red brown SANDY GRAVEL, damp, gravel, coarse to medium sand, coarse to fine multicolor gravel with few cobbles					0 0	55	
56										
57										
58										
59										
60		SC	SC; Gray and brown, fine SAND with some clay					0		
		GP-GM	GP-GM; SILTY GRAVEL, medium to coarse with multicolor gravel and few cobbles, damp					0 0	60	
61										
62										
63										
64		SP-SC	SP-SC; Dark brown, coarse grain SAND, round with CLAY					0		
65		CL-ML	CL-ML; Dark brown, oversaturated SILTY CLAY with cobbles and coarse multicolor gravel					0	65	
66										
67		SP	SP; Orange, brown, coarse grain SAND with coarse to fine multicolor gravel and some clay, saturated					0		
68										
69										
70		GP	GP; Brown, saturated, medium to coarse GRAVEL SAND with multicolor gravel adn cobbles					0	70	Sand Pack #2 Well Sand
71										
72										
73										
74		SP	SP; Brown, damp SAND, coarse to medium with mica flakes					0		

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-508**
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Stantec

DRILLING: STARTED **6/29/23** COMPLETED: **6/30/23**
INSTALLATION: STARTED **6/30/23** COMPLETED: **6/30/23**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Boart Longyear LS250**
DRILLING METHOD: **Rotosonic**
SAMPLING EQUIPMENT: **4" Sonic Core Barrel**

NORTHING (ft): **220466** EASTING (ft): **2682318**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **15.74** TOC ELEV (ft): **15.31**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **97**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in): **6**
LOGGED BY: **T. Lee** CHECKED BY: **J. Kachel**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
76		SP	SP; Dark tan, coarse to fine SAND with coarse to medium multicolor gravel					0		
77		SP	SP; Dark gray, coarse to medium SAND with multicolor gravel and cobbles, damp					0		
79		SP	SP; Light gray SAND, damp, fine with few mica flakes/black flakes					0		
80		SP	SP; Same as above					0	80	2" SCH40 Slotted PVC Casing (0.020in slot size)
85		SP	SP; Tan/gray SANDY GRAVEL with cobbles, gravel is rounded, damp					0	85	
87			Brown gray WEATHERED BEDROCK, waxy texture with mica flakes					0		End Cap
			Gray WEATHERED BEDROCK, waxy texture with mica					0		
90									90	
92			Dark gray WEATHERED BEDROCK crumbles, easily waxy texture with mica					0		
95									95	
97			End of boring							

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-509**
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Stantec

DRILLING: STARTED **6/28/23** COMPLETED: **6/29/23**
INSTALLATION: STARTED **6/29/23** COMPLETED: **6/29/23**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Boart Longyear LS250**
DRILLING METHOD: **Rotosonic**
SAMPLING EQUIPMENT: **4" Sonic Core Barrel**

NORTHING (ft): **220182** EASTING (ft): **2682556**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **18.17** TOC ELEV (ft): **17.85**
INITIAL DTW (ft): **14.9** BOREHOLE DEPTH (ft): **90**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in): **6**
LOGGED BY: **A. Wright/T. Lee** CHECKED BY: **J. Kachel**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
0			Light gray CONCRETE FILL, 6"					0		2" PVC Casing
1			APPARENT FILL: sand, silt, clay and stone mixture							
2						0.5				
3										
4										
5		SP	SP; Dark brown SITLY SAND with medium to coarse gravel, damp					0	5	
6										
7		GC	GC; Light brown CLAY with gravel, medium to coarse, angular					0		
8		CL	CL; Dry, reddish brown SANDY CLAY, fine					0		
9		SP	SP; Dry, reddish brown SAND with some round gravel					0		
10		SP	SP; Dark red brown, multicolor gravel with SILTY SAND, medium gravel, fine sand, damp					0	10	
11		GP	GP; Reddish brown, multicolor GRAVELwith SILTY SAND, medium gravel and few cobbles					30		
12										
13										
14										
15		GP	GP; Soil is impacted					469	15	▽
16										
17										
18		CL	CL; Orange brown, damp SANDY CLAY, clay sand is coarse to fine					22		
19										
20									20	
21		SM	SM; Damp, olive gray SILTY SAND, fine to coarse sand with multicolor fine gravel 10%					21.7		
22										
23										
24										

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-509**
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Stantec

DRILLING: STARTED **6/28/23** COMPLETED: **6/29/23**
INSTALLATION: STARTED **6/29/23** COMPLETED: **6/29/23**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Boart Longyear LS250**
DRILLING METHOD: **Rotosonic**
SAMPLING EQUIPMENT: **4" Sonic Core Barrel**

NORTHING (ft): **220182** EASTING (ft): **2682556**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **18.17** TOC ELEV (ft): **17.85**
INITIAL DTW (ft): **14.9** BOREHOLE DEPTH (ft): **90**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in): **6**
LOGGED BY: **A. Wright/T. Lee** CHECKED BY: **J. Kachel**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
		SM	SM; Red brown SILTY SAND with fine coarse, sand and gravel					6.4		
26										
27										
28										
29		SM	SM; Fine gray SILTY SAND with a lens of gray silty clay 2" at 29.5' and a lens of red clay at 29.8'					0		
30		CH	CH; Red CLAY lens, wet with medium fine sand					0	30	
		SP	SP; Yellow brown SAND, coarse to medium					0		
31		SC	damp					0		
32			SC; Red SAND with some clay, clay increases with depth, sandy clay lens at 32'							
		SW	SW; Light gray, coarse SAND with a lens of gray clay at 33.5' to 33.7', gray sand continues to 35'					0		
33										
34										
35		SW	SW; Light brown, satuarated, coarse to medium SAND with some silt					0	35	
36										Bentonite
37		CH	CH; Red brown CLAY with high plasticity					0		
38		SM	SM; Saturated, coarse grain SAND, round with some clay, light brown tan					0		
		SC	SC; Light brown, fine AND with some clay, very					0		
39		SM	saturated low plasticity					0		
			SM; Deep brown SILTY SAND, saturated, medium grain sand							
40		CH	CH; Multicolor, high plasticity CLAY					0	40	
		SM	SM; Medium to coarse, red SILTY CLAY with cobbles					0		
41										
		CL	CL; Gray brown SANDY CLAY, fine sand, damp					0		
42										
43										
		SW	SW; Yellow brown, fine to medium SAND with fine gravel, damp					0		
44										
45		GW	GW; Red brown, coarse to medium SAND and GRAVEL, damp					0	45	
46		GM	GM; Red, coarse fine SILTY SAND, damp with some gravel and cobbles increasing with depth					0		
47										
48										
49										

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-509**
PAGE 3 OF 4

Stantec

DRILLING: STARTED **6/28/23** COMPLETED: **6/29/23**
INSTALLATION: STARTED **6/29/23** COMPLETED: **6/29/23**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Boart Longyear LS250**
DRILLING METHOD: **Rotosonic**
SAMPLING EQUIPMENT: **4" Sonic Core Barrel**

NORTHING (ft): **220182** EASTING (ft): **2682556**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **18.17** TOC ELEV (ft): **17.85**
INITIAL DTW (ft): **14.9** BOREHOLE DEPTH (ft): **90**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in): **6**
LOGGED BY: **A. Wright/T. Lee** CHECKED BY: **J. Kachel**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
		GM	GM; Same as above					0		
55		SW	SW; Medium to fine, yellow brown SAND					0	55	
		SW	SW; Red brown GRAVEL SAND with increasing gravel and cobbles with depth, round					0		
60									60	
62		SP	SP; Brown, coarse, gray SAND with medium gravel, multicolor, round, damp					0		
63		GM	GM; Gray brown, fine SAND with coarse gravel and cobbles, damp, round, multicolor					0		
65		SM	SM; Light brown, fine gray SAND, saturated					0	65	
		SM	SM; with some cobbles					0		
70		SP	SP; Reddish brown SAND with some mica and fine gravel sand					0	70	
72		SP SM SM	SP; Dark gray band of coarse gray SAND, damp, rounded sand with mica flakes, few SM; Cobbles, coarse, multicolor GRAVEL with deep brown coarse grain sand SM; Same as above					0 0 0		Sand Pack #2 Well Sand
74		SM	SM; Light brown, saturated SANDY SILT with multicolor gravel					0		

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **S-509**
PAGE 4 OF 4

Stantec

DRILLING: STARTED **6/28/23** COMPLETED: **6/29/23**
INSTALLATION: STARTED **6/29/23** COMPLETED: **6/29/23**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Boart Longyear LS250**
DRILLING METHOD: **Rotosonic**
SAMPLING EQUIPMENT: **4" Sonic Core Barrel**

NORTHING (ft): **220182** EASTING (ft): **2682556**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **18.17** TOC ELEV (ft): **17.85**
INITIAL DTW (ft): **14.9** BOREHOLE DEPTH (ft): **90**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in): **6**
LOGGED BY: **A. Wright/T. Lee** CHECKED BY: **J. Kachel**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
76		SM	SM; Same as above					0		
77		CL	CL; Gray, medium plasticity CLAY					0		
78		GC	GC; Light brown CLAY with gravel and decreasing clay with depth, coarse to fine gravel					0		
79										
80		GC	GC; Same as above					0	80	2" SCH40 Slotted PVC Casing (0.020in slot size)
81		SP	SP; Yellow brown, medium gray SAND, round, saturated					0		
82										
83										
84										
85		GP	GP; Medium to coarse SAND and GRAVEL was mica flakes rounded, yellow brown sand, multicolor gravel					0	85	
86										
87										
88			Yellow brown, weathered BEDROCK, waxy texture, mica flakes					0		End Cap
89										
90			Gray weathered BEDROCK, waxy texture, mica flakes End of boring					0	90	
91										
92										
93										
94										
95									95	
96										
97										
98										
99										

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **UDEX-AS-01**
PAGE 1 OF 1

Stantec

DRILLING: STARTED **5/20/24** COMPLETED: **5/20/24**
INSTALLATION: STARTED **5/20/24** COMPLETED: **5/20/24**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft): **220574** EASTING (ft): **2682403**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **24**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1.5** BOREHOLE DIAMETER (in):
LOGGED BY: **C. Lee** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			No sampling performed							1.5" Stainless Steel Casing
22		SP	SP; SAND (medium brown, coarse), gravel (some, angular) (saturated)				8 8 13 14	30		Grout
24			End of Boring							Sand
										1.5" Stainless Steel Screen

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-AS-02**

Stantec

DRILLING: STARTED **5/21/24** COMPLETED: **5/21/24**
INSTALLATION: STARTED **5/21/24** COMPLETED: **5/21/24**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft): **220582** EASTING (ft): **2682380**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **24**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1.5** BOREHOLE DIAMETER (in):
LOGGED BY: **C. Lee** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			No sampling performed							1.5" Stainless Steel Casing
22		SP	SP; SAND (medium brown, coarse), gravel (some, multicolored, rounded) (saturated)				4 8 11 14	382 1974		Grout Sand 1.5" Stainless Steel Screen
24			End of Boring							

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-AS-03**

Stantec

DRILLING: STARTED **5/21/24** COMPLETED: **5/21/24**
INSTALLATION: STARTED **5/21/24** COMPLETED: **5/21/24**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft): **220555** EASTING (ft): **2682391**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **26**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1.5** BOREHOLE DIAMETER (in):
LOGGED BY: **C. Lee** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			No sampling performed							1.5" Stainless Steel Casing
22		GP	GP; GRAVEL with sandy clay (some)				13	896		Clay
23		GP	GP; GRAVEL (medium), sand (some, medum brown) (saturated)			0.41	12 6	88		
24		SP	SP; SAND (medium brown, coarse), gravel (few, small) (saturated)				6 8	193		1.5" Stainless Steel Screen
25		SM	SM; SILTY SAND (red brown), gravel (medium, angular)			2	16 22	40		Sand
26			End of Boring				30	3		

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-AS-04**

Stantec

DRILLING: STARTED **5/22/24** COMPLETED: **5/22/24**
INSTALLATION: STARTED **5/22/24** COMPLETED: **5/22/24**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft): **220543** EASTING (ft): **2682418**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **24**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1.5** BOREHOLE DIAMETER (in):
LOGGED BY: **C. Lee** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			No sampling performed							
22		SP	SP; SAND (medium brown), gravel (some, multicolor, round, small to large with depth) (saturated)			2	5 5 13 13	2436.9 142.7		
24			End of Boring							

Well Construction: 1.5" Stainless Steel Casing; Grout; Clay; Sand; 1.5" Stainless Steel Screen

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-AS-05**

Stantec

DRILLING: STARTED **5/22/24** COMPLETED: **5/22/24**
INSTALLATION: STARTED **5/22/24** COMPLETED: **5/22/24**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft): **220566** EASTING (ft): **2682423**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **24**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1.5** BOREHOLE DIAMETER (in):
LOGGED BY: **C. Lee** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			No sampling performed							1.5" Stainless Steel Casing
22		SP	SP; SAND (medium brown, coarse), gravel (some, multicolor, round) (saturated)			2	4 11 15 17	2500		Sand
23			(reddish brown in bottom 1")							1.5" Stainless Steel Screen
24			End of Boring					27		

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-AS-06**

Stantec

DRILLING: STARTED **5/23/24** COMPLETED: **5/23/24**
INSTALLATION: STARTED **5/23/24** COMPLETED: **5/23/24**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft): **220468** EASTING (ft): **2682317**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **24**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1.5** BOREHOLE DIAMETER (in):
LOGGED BY: **C. Lee** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			No sampling performed							1.5" Stainless Steel Casing
20		SP	SP; SAND (medium brown), silt (some), gravel (some, multicolor, round) (saturated)				6	1312	20	Clay
21							7	26.3		
22			1" lense of weathered rock (red brown)				8 13	2300		Sand 1.5" Stainless Steel Screen
23							7 11 13 14			
24			End of Boring					95		

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-AS-07**

Stantec

DRILLING: STARTED **5/23/24** COMPLETED: **5/23/24**
INSTALLATION: STARTED **5/23/24** COMPLETED: **5/23/24**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft): **220474** EASTING (ft): **2682292**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **22**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1.5** BOREHOLE DIAMETER (in):
LOGGED BY: **C. Lee** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			No sampling performed							1.5" Stainless Steel Casing
20		SP	SP; SAND (medium brown, coarse), gravel (some, multicolor) (saturated)			1	3 3 1 1	1407.5	20	Clay Sand
22			End of Boring					407		1.5" Stainless Steel Screen

Grout

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-AS-08**

Stantec

DRILLING: STARTED **5/28/24** COMPLETED: **5/28/24**
INSTALLATION: STARTED **5/28/24** COMPLETED: **5/28/24**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft): **220466** EASTING (ft): **2682336**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **22**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1.5** BOREHOLE DIAMETER (in):
LOGGED BY: **C. Lee** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			No sampling performed							1.5" Stainless Steel Casing
20		SP	SP; SAND (medium brown, coarse), gravel (some, multicolor, round) (saturated)			2	3 9 9 14	2126.2	20	Clay Sand 1.5" Stainless Steel Screen
22			End of Boring					265		

Grout

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-AS-09**

Stantec

DRILLING: STARTED **5/29/24** COMPLETED: **5/29/24**
INSTALLATION: STARTED **5/29/24** COMPLETED: **5/29/24**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft): **220439** EASTING (ft): **2682333**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **22**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1.5** BOREHOLE DIAMETER (in):
LOGGED BY: **C. Lee** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			No sampling performed							1.5" Stainless Steel Casing
20		SP	SP; SAND (dark brown, coarse), gravel (multicolor, round) (saturated)			2	4 8 8 15	2156	20	Grout
22			(medium brown) End of Boring					199		Clay Sand 1.5" Stainless Steel Screen

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **UDEX-AS-10**
PAGE 1 OF 1

Stantec

DRILLING: STARTED **5/29/24** COMPLETED: **5/29/24**
INSTALLATION: STARTED **5/29/24** COMPLETED: **5/29/24**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft): **220450** EASTING (ft): **2682306**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **22**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1.5** BOREHOLE DIAMETER (in):
LOGGED BY: **C. Lee** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			No sampling performed							1.5" Stainless Steel Casing
20		SP	SP; SAND (dark brown, coarse), gravel (multicolor, round) (saturated)			2	5 10 15 17	2302 283	20	Clay Sand 1.5" Stainless Steel Screen
22			End of Boring							

Grout

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **UDEX-AS-11**
PAGE 1 OF 1

Stantec

DRILLING: STARTED **1/21/25** COMPLETED: **1/21/25**
INSTALLATION: STARTED **1/21/25** COMPLETED: **1/21/25**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft): **220482** EASTING (ft): **2682448**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **21.5** BOREHOLE DEPTH (ft): **25**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in):
LOGGED BY: **C. Lee** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			No sampling performed							2" Stainless Steel Casing
23		SP	SP; SAND (fine), gravel (tan, angular) (dry)				32	4241		
24		GP	GP; Crushed ROCK (light gray) (dry)			1	23			
		SP	SP; SAND (medium brown, coarse), gravel (multicolor, small) (wet)				16			
25			End of Boring				14	2047		
										Grout
										Bentonite
										Sand
										2" Stainless Steel Screen

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **UDEX-AS-12**
PAGE 1 OF 1

Stantec

DRILLING: STARTED **1/22/25** COMPLETED: **1/22/25**
INSTALLATION: STARTED **1/22/25** COMPLETED: **1/22/25**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft): **220471** EASTING (ft): **2682435**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **25**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in):
LOGGED BY: **C. Lee** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)
			No sampling performed					
23		SP	SP; SAND (fine), gravel (tan, angular) (dry)				47	4042
24		GP	GP; Crushed ROCK (light gray) (dry)			0.75	22 16 12	
25			End of Boring					3192

Depth (feet): 5, 10, 15, 20, 25

Well Construction:
- 2" Stainless Steel Casing
- Grout
- Bentonite
- Sand
- 2" Stainless Steel Screen

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-AS-13**

Stantec

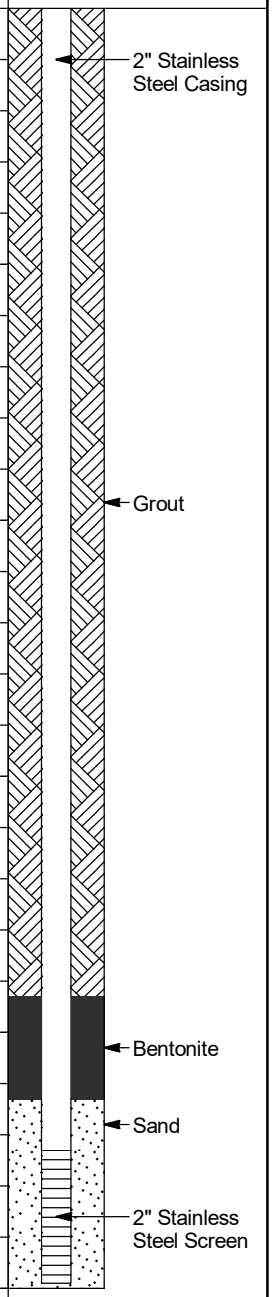
DRILLING: STARTED **1/28/25** COMPLETED: **1/28/25**
INSTALLATION: STARTED **1/28/25** COMPLETED: **1/28/25**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft): **220489** EASTING (ft): **2682415**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **25**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in):
LOGGED BY: **C. Lee** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)
			No sampling performed					
23		SP	SP; SAND (medium gray, fine), gravel (angular) (damp)				26	2808
24		GP	GP; GRAVEL (gray, crushed)			1.16	5	2654
		SP	SP; SAND (dark gray, coarse), silt (little), gravel (some, multicolor) (saturated)				13	
25			End of Boring				5	430

Depth (feet): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29

Well Construction



GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-AS-14**

Stantec

DRILLING: STARTED **1/28/25** COMPLETED: **1/28/25**
INSTALLATION: STARTED **1/28/25** COMPLETED: **1/28/25**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft): **220456** EASTING (ft): **2682423**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **25**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in):
LOGGED BY: **C. Lee** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			No sampling performed							
23		SP	SP; SAND (gray brown, coarse), silt (little), gravel (multicolor, round, small) (saturated)			1.58	7 10 16 25	1078 2570		
25			End of Boring							

Well Construction: 2" Stainless Steel Casing; Grout; Bentonite; Sand; 2" Stainless Steel Screen

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-AS-15**

Stantec

DRILLING: STARTED **1/28/25** COMPLETED: **1/28/25**
INSTALLATION: STARTED **1/28/25** COMPLETED: **1/28/25**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft): **220465** EASTING (ft): **2682396**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **25**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in):
LOGGED BY: **C. Lee** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			No sampling performed							
23		SP	SP; SAND (dark brown, coarse), silt (little), gravel (multicolor) (saturated)			1	2 1 1 1	298		
25			End of Boring					2680		

Well Construction: 2" Stainless Steel Casing; Grout; Bentonite; Sand; 2" Stainless Steel Screen

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **UDEX-AS-16**
PAGE 1 OF 1

Stantec

DRILLING: STARTED **1/29/25** COMPLETED: **1/29/25**
INSTALLATION: STARTED **1/29/25** COMPLETED: **1/29/25**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft): **220648** EASTING (ft): **2682308**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **25**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in):
LOGGED BY: **C. Lee** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			No sampling performed							2" Stainless Steel Casing
23		SM	SM; SILTY SAND (medium brown), gravel (some, multicolor) (saturated)			2	1 4 5 9	2655		
24		SM	SM; SILTY SAND (medium brown, fine), mica flakes (some) (damp)							
25			End of Boring					203		

Grout
Bentonite
Sand
2" Stainless Steel Screen

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-AS-17**

Stantec

DRILLING: STARTED **1/29/25** COMPLETED: **1/29/25**
INSTALLATION: STARTED **1/29/25** COMPLETED: **1/29/25**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft): **220645** EASTING (ft): **2682301**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **25**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in):
LOGGED BY: **C. Lee** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			No sampling performed							
23		SP	SP; SAND (medium brown, fine to coarse), gravel (some, multicolor), silt (some) (saturated)				3 3 8 10	665 432		
25			End of Boring							

Well Construction: 2" Stainless Steel Casing; Grout; Bentonite; Sand; 2" Stainless Steel Screen

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-AS-18**

Stantec

DRILLING: STARTED **1/30/25** COMPLETED: **1/30/25**
INSTALLATION: STARTED **1/30/25** COMPLETED: **1/30/25**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft): **220608** EASTING (ft): **2682306**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **25**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in):
LOGGED BY: **C. Lee** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			No sampling performed							
23		GW	GW; GRAVEL (black), silt (some product, odor)			0.33		4199		
25			End of Boring							

Well Construction: 2" Stainless Steel Casing; Grout; Bentonite; Sand; 2" Stainless Steel Screen

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-AS-19**

Stantec

DRILLING: STARTED **1/30/25** COMPLETED: **1/31/25**
INSTALLATION: STARTED **1/31/25** COMPLETED: **1/31/25**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft): **220603** EASTING (ft): **2682288**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **25**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in):
LOGGED BY: **C. Lee** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)
			No sampling performed					
23		GM	GM; GRAVEL and SAND (dark brown, coarse), silt (some) (wet)				22	3753
24		SM	SM; SILTY SAND (tan, fine), gravel			0.75	42 22 14	
25			End of Boring					1211

Well Construction: 2" Stainless Steel Casing; Grout; Bentonite; Sand; 2" Stainless Steel Screen

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **UDEX-AS-20**
PAGE 1 OF 1

Stantec

DRILLING: STARTED **1/31/25** COMPLETED: **1/31/25**
INSTALLATION: STARTED **1/31/25** COMPLETED: **1/31/25**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft): **220619** EASTING (ft): **2682294**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **25**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **2** BOREHOLE DIAMETER (in):
LOGGED BY: **C. Lee** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			No sampling performed							
23		SM	SM; SILTY CLAYEY SAND (brown), gravel (few small) (wet)			1.1	5	2621		
24		SM	SM; SILTY SAND (medium brown, coarse), gravel (rounded) (wet)				14 10 8			
25			End of Boring					2634		

Well Construction: 2" Stainless Steel Casing; Grout; Bentonite; Sand; 2" Stainless Steel Screen

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **UDEX-BH-21-01**
PAGE 1 OF 1

Stantec

DRILLING: STARTED **2/25/21** COMPLETED: **2/25/21**
INSTALLATION: STARTED **2/25/21** COMPLETED: **2/25/21**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Geoprobe 7822 DT**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **Macrocore Discrete**

NORTHING (ft): **219975** EASTING (ft): **2682449**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **9** BOREHOLE DEPTH (ft): **20**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **J. Kachel** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)
			Air Knife						
5		SW	SW; SAND (grayish brown, fine)						5
6		SPG	SPG; SAND and GRAVEL (yellow to gray to brown, few fines, tight) (wet)					87	
7						2		108	
8									
9			(wet)					20	▽
10		SPG	SPG; SAA (grayish brown to dark dark), gravel (some, very coarse) (wet)						10
11									
12								885	
13						2		1685	
14			(dark gray)						
15		SPG	SPG; SAA (less very coarse gravel)					340	15
16									
17		SP	SP; SAND (tan, grayish brown, fine)					166	
18									
19									
20			End of Boring					287	20
21									
22									
23									
24									

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **UDEX-EW-01**
PAGE 1 OF 1

DRILLING: STARTED **2/16/21** COMPLETED: **2/17/21**
INSTALLATION: STARTED **2/17/21** COMPLETED: **2/17/21**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon, Cuttings**

NORTHING (ft): **220608** EASTING (ft): **2682523**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **20**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **A Klingbeil, Dana H.** CHECKED BY: **J. Kachel**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			Air Knife							Cuttings 6" PVC Casing
5		SC	SC; SAND (greenish brown to ??? yellow, coarse to fine), gravel (trace), clay/silt (moist)			0.7	1 1 6 9	0 0	5	Hole Plug
7		SC	SC; SAA (moist)				6 10	0		
8		GM	GM; GRAVEL (reddish brown) sand (fine to coarse), silt (little) (moist) (gravel hererogeneous, red mudstone and quartz)			1.2	13 21	0		
9		GM	GM; SAA (damp)					164		
10						1.4	31 15 15 16		10	Bentonite
13		GM	GM; SAA (moist)				40 22 27 28	160		Sand Pack #2 Well Sand
15		GM	GM; SAA (moist)				27 38 49 38	103	15	6" SCH40 Slotted PVC Casing (0.020in slot size)
18		GM	GM; SAA (reddish yellow) (moist)					232		
19						1.9				End Cap
20			End of Boring						20	

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-EW-02**

Stantec

DRILLING: STARTED **2/24/21** COMPLETED: **2/25/21**
INSTALLATION: STARTED **2/25/21** COMPLETED: **2/25/21**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted IR/Geoprobe 7822DT**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Direct Push Macrocore**

NORTHING (ft): **220292** EASTING (ft): **2682214**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **15**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **J. Kachel** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			Air Knife							6" PVC Casing
5		SP	SP; SAND (gray, fine), gravel (some medium at base)					1	5	Bentonite
7		SP	SP; SAND (orange to gray, fine to medium), gravel (fine to medium, rounded) (moist)			3		1		Sand Pack #2 Well Sand
10		SP	SP; SAA (orangish brown to gray to reddish brown to orange) (fine in last 1'), gravel (little) (moist)			2		1 2 45	10	6" SCH40 Slotted PVC Casing (0.020in slot size)
15			End of Boring					800	15	End Cap
20									20	

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-EW-03**

Stantec

DRILLING: STARTED **2/24/21** COMPLETED: **2/24/21**
INSTALLATION: STARTED **2/24/21** COMPLETED: **2/24/21**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted IR/Geoprobe 7822DT**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Direct Push Macrocore**

NORTHING (ft): **220633** EASTING (ft): **2682302**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **18**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **J. Kachel** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1			Air Knife; APPARENET FILL {possible re-worked Cape May to possible real}							6" PVC Casing
2										
3										
4										
5									5	Bentonite
6		SW	SW; SAND (coarse) gravel (some, fine to medium, trace from 7-8') (2" red mudstone clast at 8')					0		
7								0		
8		SP-SM	SP-SM; SAND to SILT grading to SAND (fine) gravel (trace) (gray to yellowish brown) (moist to dry)			3.5		3.3		
9								36		
10		SPG	SPG; SAND (Cape May, fine) to gravel (coarse) (light grayish tan)						10	
11								2.8		Sand Pack #2 Well Sand
12			(orangish brown)			3		20.7		
13			(broken quatzire cobble)					135		
14		SPG	SPG; SAA (dry to moist) (wet at bottom)					12.3		
15								17.8	15	6" SCH40 Slotted PVC Casing (0.020in slot size)
16						3		59.5		
17								1728		End Cap
18			End of Boring					1128		
19										
20									20	
21										
22										
23										
24										

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

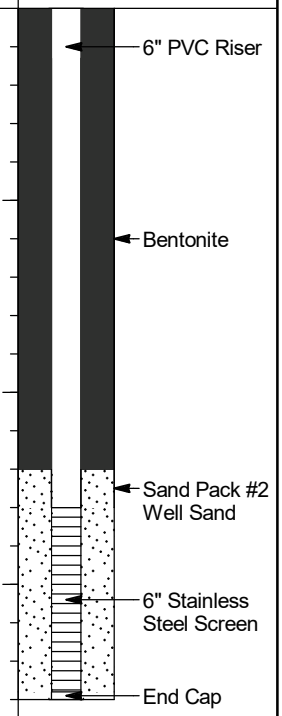
WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-EW-04**

Stantec

DRILLING: STARTED **2/2/22** COMPLETED: **2/2/22**
INSTALLATION: STARTED **2/2/22** COMPLETED: **2/2/22**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **220574** EASTING (ft): **2682279**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **18**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **M. Vitale** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1–18			No logging or sampling performed						1–18	6" PVC Riser; Bentonite; Sand Pack #2 Well Sand; 6" Stainless Steel Screen; End Cap
18			End of Boring							
19–39									19–39	



GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **UDEX-EW-05**
PAGE 1 OF 1

Stantec

DRILLING: STARTED **2/1/22** COMPLETED: **2/1/22**
INSTALLATION: STARTED **2/1/22** COMPLETED: **2/1/22**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **220509** EASTING (ft): **2682242**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **16**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **M. Vitale** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1–16			No logging or sampling performed						1–16	6" PVC Riser; Bentonite; Sand Pack #2 Well Sand; 6" Stainless Steel Screen; End Cap
16			End of Boring							
17–39									20–35	

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-EW-06**

Stantec

DRILLING: STARTED **2/2/22** COMPLETED: **2/2/22**
INSTALLATION: STARTED **2/2/22** COMPLETED: **2/2/22**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **220439** EASTING (ft): **2682218**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **15**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **M. Vitale** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1–15			No logging or sampling performed						1–15	6" PVC Riser; Bentonite; Sand Pack #2 Well Sand; 6" Stainless Steel Screen; End Cap
15			End of Boring							
16–39									20–35	

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **UDEX-EW-07**
PAGE 1 OF 1

Stantec

DRILLING: STARTED **2/4/22** COMPLETED: **2/4/22**
INSTALLATION: STARTED **2/4/22** COMPLETED: **2/4/22**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **220371** EASTING (ft): **2682188**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **15**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **M. Vitale** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1–15			No logging or sampling performed						0–15	6" PVC Riser; Bentonite; Sand Pack #2 Well Sand; 6" Stainless Steel Screen; End Cap
15			End of Boring							
16–39										

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-EW-08**

Stantec

DRILLING: STARTED **2/9/22** COMPLETED: **2/9/22**
INSTALLATION: STARTED **2/9/22** COMPLETED: **2/9/22**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **220283** EASTING (ft): **2682308**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **10**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **M. Vitale** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1			No logging or sampling performed							6" PVC Riser
2										Bentonite
3										
4										
5									5	Sand Pack #2 Well Sand
6										
7										
8										6" Stainless Steel Screen
9										
10			End of Boring						10	End Cap
11										
12										
13										
14										
15									15	
16										
17										
18										
19										
20									20	
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33										
34										
35									35	
36										
37										
38										
39										

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-EW-09**

Stantec

DRILLING: STARTED **2/9/22** COMPLETED: **2/9/22**
INSTALLATION: STARTED **2/9/22** COMPLETED: **2/9/22**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **220300** EASTING (ft): **2682409**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **9.5**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **M. Vitale** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1			No logging or sampling performed							6" PVC Riser
2										Bentonite
3										
4										Sand Pack #2 Well Sand
5									5	
6										
7										6" Stainless Steel Screen
8										
9										End Cap
10			End of Boring						10	
11										
12										
13										
14										
15									15	
16										
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32										
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35									35	
36										
37										
38										
39										

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-EW-10**

Stantec

DRILLING: STARTED **2/9/22** COMPLETED: **2/9/22**
INSTALLATION: STARTED **2/9/22** COMPLETED: **2/9/22**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **220306** EASTING (ft): **2682511**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **9.5**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **M. Vitale** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1			No logging or sampling performed							6" PVC Riser
2										Bentonite
3										
4										Sand Pack #2 Well Sand
5									5	
6										
7										6" Stainless Steel Screen
8										
9										End Cap
10			End of Boring						10	
11										
12										
13										
14										
15									15	
16										
17										
18										
19										
20									20	
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35									35	
36										
37										
38										
39										

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **UDEX-EW-11**
PAGE 1 OF 1

Stantec

DRILLING: STARTED **1/27/22** COMPLETED: **1/27/22**
INSTALLATION: STARTED **1/27/22** COMPLETED: **1/27/22**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **220391** EASTING (ft): **2682437**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **15**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **M. Vitale** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1–15			No logging or sampling performed						1–15	6" PVC Riser; Bentonite; Sand Pack #2 Well Sand; 6" Stainless Steel Screen; End Cap
15			End of Boring							

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-EW-12**

Stantec

DRILLING: STARTED **2/1/22** COMPLETED: **2/1/22**
INSTALLATION: STARTED **2/1/22** COMPLETED: **2/1/22**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **220432** EASTING (ft): **2682511**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **15**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **M. Vitale** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1–14			No logging or sampling performed						1–14	6" PVC Riser; Bentonite; Sand Pack #2 Well Sand; 6" Stainless Steel Screen; End Cap
15			End of Boring						15	
16–39									16–39	

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

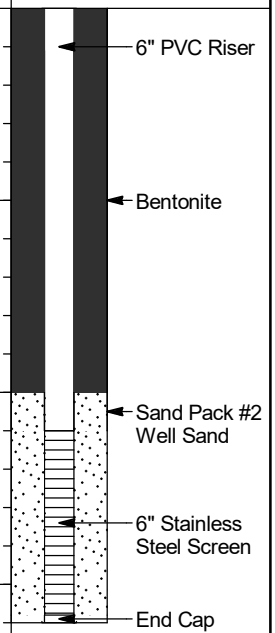
WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-EW-13**

Stantec

DRILLING: STARTED **2/7/22** COMPLETED: **2/7/22**
INSTALLATION: STARTED **2/7/22** COMPLETED: **2/7/22**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **220518** EASTING (ft): **2682524**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **16**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **M. Vitale** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1–16			No logging or sampling performed							
16			End of Boring							



GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-EW-14**

Stantec

DRILLING: STARTED **2/4/22** COMPLETED: **2/4/22**
INSTALLATION: STARTED **2/4/22** COMPLETED: **2/4/22**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **220562** EASTING (ft): **2682444**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **17**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **M. Vitale** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1			No logging or sampling performed							6" PVC Riser
5									5	Bentonite
10									10	Sand Pack #2 Well Sand
15									15	6" Stainless Steel Screen
17			End of Boring							End Cap
20									20	
25									25	
30									30	
35									35	

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-EW-15**

Stantec

DRILLING: STARTED **2/3/22** COMPLETED: **2/3/22**
INSTALLATION: STARTED **2/3/22** COMPLETED: **2/3/22**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **220198** EASTING (ft): **2682227**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **13**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **M. Vitale** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1			No logging or sampling performed							6" PVC Riser
2										
3										Bentonite
4										
5									5	
6										
7										Sand Pack #2 Well Sand
8										
9										
10									10	6" Stainless Steel Screen
11										
12										End Cap
13			End of Boring							
14										
15									15	
16										
17										
18										
19										
20									20	
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35									35	
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37										
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39										

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-EW-16**

Stantec

DRILLING: STARTED **2/10/22** COMPLETED: **2/10/22**
INSTALLATION: STARTED **2/10/22** COMPLETED: **2/10/22**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **220167** EASTING (ft): **2682320**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **11**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **M. Vitale** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1			No logging or sampling performed							6" PVC Riser
2										Bentonite
3										
4										
5									5	Sand Pack #2 Well Sand
6										
7										
8										6" Stainless Steel Screen
9										
10									10	
11			End of Boring							End Cap
12										
13										
14										
15									15	
16										
17										
18										
19										
20									20	
21										
22										
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35									35	
36										
37										
38										
39										

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-EW-17**

Stantec

DRILLING: STARTED **2/3/22** COMPLETED: **2/3/22**
INSTALLATION: STARTED **2/3/22** COMPLETED: **2/3/22**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **220125** EASTING (ft): **2682253**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **13**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **M. Vitale** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1			No logging or sampling performed							6" PVC Riser
2										
3										Bentonite
4										
5									5	
6										
7										Sand Pack #2 Well Sand
8										
9										
10									10	6" Stainless Steel Screen
11										
12										End Cap
13			End of Boring							
14										
15									15	
16										
17										
18										
19										
20									20	
21										
22										
23										
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25									25	
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GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-EW-18**

Stantec

DRILLING: STARTED **2/10/22** COMPLETED: **2/10/22**
INSTALLATION: STARTED **2/10/22** COMPLETED: **2/10/22**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **220086** EASTING (ft): **2682335**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **10**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **M. Vitale** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1			No logging or sampling performed							6" PVC Riser
2										Bentonite
3										
4										
5									5	Sand Pack #2 Well Sand
6										
7										
8										6" Stainless Steel Screen
9										
10			End of Boring						10	End Cap
11										
12										
13										
14										
15									15	
16										
17										
18										
19										
20									20	
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PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-EW-19**

Stantec

DRILLING: STARTED **2/4/22** COMPLETED: **2/4/22**
INSTALLATION: STARTED **2/4/22** COMPLETED: **2/4/22**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **220046** EASTING (ft): **2682265**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **11**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **M. Vitale** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1			No logging or sampling performed							6" PVC Riser
2										Bentonite
3										
4										
5									5	Sand Pack #2 Well Sand
6										
7										
8										6" Stainless Steel Screen
9										
10									10	
11			End of Boring							End Cap
12										
13										
14										
15									15	
16										
17										
18										
19										
20									20	
21										
22										
23										
24										
25									25	
26										
27										
28										
29										
30									30	
31										
32										
33										
34										
35									35	
36										
37										
38										
39										

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-EW-20**

Stantec

DRILLING: STARTED **2/10/22** COMPLETED: **2/10/22**
INSTALLATION: STARTED **2/10/22** COMPLETED: **2/10/22**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **219995** EASTING (ft): **2682319**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **10**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **M. Vitale** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1			No logging or sampling performed							6" PVC Riser
2										Bentonite
3										
4										
5									5	Sand Pack #2 Well Sand
6										
7										
8										6" Stainless Steel Screen
9										
10			End of Boring						10	End Cap
11										
12										
13										
14										
15									15	
16										
17										
18										
19										
20									20	
21										
22										
23										
24										
25									25	
26										
27										
28										
29										
30									30	
31										
32										
33										
34										
35									35	
36										
37										
38										
39										

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-EW-21**

Stantec

DRILLING: STARTED **2/9/22** COMPLETED: **2/9/22**
INSTALLATION: STARTED **2/9/22** COMPLETED: **2/9/22**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **219930** EASTING (ft): **2682383**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **10**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **M. Vitale** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1			No logging or sampling performed							6" PVC Riser
2										Bentonite
3										
4										
5									5	Sand Pack #2 Well Sand
6										
7										
8										6" Stainless Steel Screen
9										
10			End of Boring						10	End Cap
11										
12										
13										
14										
15									15	
16										
17										
18										
19										
20									20	
21										
22										
23										
24										
25									25	
26										
27										
28										
29										
30									30	
31										
32										
33										
34										
35									35	
36										
37										
38										
39										

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-EW-22**

Stantec

DRILLING: STARTED **2/8/22** COMPLETED: **2/8/22**
INSTALLATION: STARTED **2/8/22** COMPLETED: **2/8/22**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **219858** EASTING (ft): **2682451**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **11**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **M. Vitale** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			No logging or sampling performed							6" PVC Riser; Bentonite; Sand Pack #2 Well Sand; 6" Stainless Steel Screen; End Cap
			End of Boring							

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-EW-23**

Stantec

DRILLING: STARTED **2/8/22** COMPLETED: **2/8/22**
INSTALLATION: STARTED **2/8/22** COMPLETED: **2/8/22**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-55**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Auger Cuttings**

NORTHING (ft): **219943** EASTING (ft): **2682487**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **11**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **M. Vitale** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1			No logging or sampling performed							6" PVC Riser
2										Bentonite
3										
4										
5									5	Sand Pack #2 Well Sand
6										
7										
8										6" Stainless Steel Screen
9										
10									10	
11			End of Boring							End Cap
12										
13										
14										
15									15	
16										
17										
18										
19										
20									20	
21										
22										
23										
24										
25									25	
26										
27										
28										
29										
30									30	
31										
32										
33										
34										
35									35	
36										
37										
38										
39										

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-EW-24**

Stantec

DRILLING: STARTED **1/29/25** COMPLETED: **1/29/25**
INSTALLATION: STARTED **1/29/25** COMPLETED: **1/29/25**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted CME-75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft): **220421** EASTING (ft): **2682432**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **13**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **6** BOREHOLE DIAMETER (in): **12**
LOGGED BY: **C. Lee** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			No log or sampling information.							
9			APPARENT FILL [crushed rock, angular gravel, some fine sand] (wet)				10	0.0		
10		SP	SP; SAND (red brown, fine), gravel (round), silt (little) (damp)			1.7	18 6 6	1.5		
11							7	0.9		
12						1.4	6 9 16	0.0		
13			End of Boring							

Well Construction: 6" PVC Riser; Grout; Bentonite; Sand Pack #2 Well Sand; 6" Stainless Steel Screen; End Cap

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **UDEX-UVHP-01**
PAGE 1 OF 1

DRILLING: STARTED **5/14/19** COMPLETED: **5/14/19**
INSTALLATION: STARTED **5/14/19** COMPLETED: **5/14/19**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Groprobe 6620 DT**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **Direct Push**

NORTHING (ft): **220399** EASTING (ft): **2682238**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **19.36** BOREHOLE DEPTH (ft): **29.7**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **A Klingbeil** CHECKED BY: **J. Kachel**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)
			Hydrovac to 6' - SAND select BACKFILL						
4–8		SW-SM	SW-SM; SAND (reddish yellow to strong brown, medium to coarse), gravel (some very coarse, trace fine to medium) (heterogeneous) (moist), silt (fine, coarsens with depth)			1.1		0.0	5
8		CL	CL; SILTY CLAY (light gray to reddish yellow)					0.0	
9		SM	SM; SAND (reddish yellow, fine), stily (trace to little), mica (slight)					0.0	
10		CL	CL; SILTY CLAY (dark gray, sandy) (moist)			2.5			10
11		SP-SM	SP-SM; SAND (yellow to grayish brown, coarse, fine with depth), silt (trace) (moist)						
12		CH	CH; SILTY CLAY (light gray), sand (trace fine) (moist)					4	
12		GM	GM; SAND and GRAVEL (very coarse sand and fine to medium gravel), little silt, (damp) (coarse gravel in shoe)						
13–15		GM	GM; SAA (sand and silt and clay) (weathered) (appearance) (heterogeneous) (damp to moist)			2.3			15
16		GM	GM; SAA (few sand lenses), silt (little) (moist to wet)					257	
17								72	
18		SP-SM	SP-SM; SAND (strong brown, coarse to fine, little very coarse), pebbles (trace), silt (trace) (saturated)			3.3			
19		SP-SM	SP-SM; SAND (fine, trace medium to coarse), silt (trace)						▽
20			No Recovery						20
21–23						0.0			
24		GW-GM	GW-GM; GRAVEL (reddish brown to strong brown, coarse to medium), sand (some to trace, coarse), silt (trace) (saturated)					18	
25		GM							25
26		CL	CL; SILTY CLAY (reddish yellow to gray)			2.3		38	
27–29									
30			End of Boring						30
31–34									

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **UDEX-UVHP-07**
PAGE 1 OF 1

DRILLING: STARTED **5/15/19** COMPLETED: **5/15/19**
INSTALLATION: STARTED **5/15/19** COMPLETED: **5/15/19**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Groprobe 7822 DT**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **Direct Push**

NORTHING (ft): **220647** EASTING (ft): **2682309**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **34**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **A Klingbeil** CHECKED BY: **J. Kachel**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)
1			APPARENT FILL						
2									
3									
4									
5									5
6		SM	SM; SAND (reddish yellow to grayish brown, fine), clay (little to some clay/silt)(micaceous) (moist to wet), gravel at bottom contact			1.8		0.0	
7		SM	SM; SAND (reddish yellow, coarse to fine, little very coarse), pebbles (trace), gravel (little, fine to medium) (heterogenous) (subangular) (damp)					0.0	
8		SM	SM; SAA (damp to dry)						
9									
10		SC	SC; SAND (brownish gray, very fine), clayey silt (some to trace) (micaceous) (moist to wet)			2.6			10
11		SP-SM	SP-SM; SAND (pale green to brownish gray, fine to coarse), sand (trace coarse) (damp)						
12		SP-SM	SP-SM; SAA (coarsens down to mostly very coarse), gravel (little fine) (damp)					0.0	
13		GM	GM; GRAVEL (very coarse, fine to coarse), sand (fine to coarse) (weathered), silt (trace to little) (damp)					6.7	
14						2.8			
15									15
16		GM	GM; SAA (moist)					7	
17		SM	SM; SAND (reddish yellow, fine to medium), silt (trace) (laminated) (moist to wet)					420	
18		GM	GM; GRAVEL (reddish brown, very coarse) (moist, wet lenses)			2.8		476	
19									
20		GM	GM; SAA (saturated at 20.8')					1126	20
21		SM	SM; SAND (brownish gray, silty, fine to medium), gravel (trace) (saturated)					117	
22		GM	GM; SA 20-21 (wet)			3.0		411	
23		SP-SM	SP-SM; SAND (brownish gray, medium to coarse to fine), gravel (trace to no, fine) (saturated)					200 115	
24		SP-SM	SP-SM; SAA (saturated) (runny)					9.5	
25									25
26		GM	GM; GRAVEL (very coarse, vericolored) (wet)			3.5		5	
27									
28									
29		SP-SM	SP-SM; SAND (strong brown, fine), trace silt (saturatged)					38	
30		CL-ML	CL-ML; CLAY/SILT (light gray) (micaceous) (reddish yellow laminations of very fine to fine sand) (moist to damp)					1	30
31									
32			End of Boring						
33									
34									

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **UDEX-UVHP-08**
PAGE 1 OF 1

Stantec

DRILLING: STARTED **5/15/19** COMPLETED: **5/15/19**
INSTALLATION: STARTED **5/15/19** COMPLETED: **5/15/19**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Groprobe 7822 DT**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **Direct Push**

NORTHING (ft): **220568** EASTING (ft): **2682403**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **20**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **A Klingbeil** CHECKED BY: **J. Kachel**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)
			APPARENT FILL						
5		SM	SM; SAND (greenish gray, fine to medium), silt (little coarse, trace to no), gravel (coarsens with depth, some fine) (damp)			1.7		3.2	5
8		GP-GM	GP-GM; GRAVEL (very coarse fine to medium), sand (some, fine to coarse), silt (trace to medium coarse) (damp)					0.0	
9		SP-SM	SP-SM; SAND (light brown to brown, very fine to fine, trace medium to coarse) (loose), gravel (few stringers), silt (trace to no) (micaceous) (damp)					0.0	
10						2.7			10
12		GW-GM	GW-GM; GRAVEL (very coarse, fine to medium), sand (small to trace fine to coarse), silt (trace to no) (damp)					0.7	
14						3.7		1.9	
15		SP-SM	SP-SM; SAND (reddish brown to strong brown, medium to coarse), silt (trace to little fine, trace very coarse)					42	15
16		GM	GM; GRAVEL (very coarse) and SAND (fine to coarse as above) (soft layers, dense where gravel weathered to clay/silt matrix) (moist) (no saturation)					8.4	
18						3.2		862	
19								1581	
								787	
20			End of Boring - Refusal						20

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **UDEX-VP-1A**
PAGE 1 OF 1

Stantec

DRILLING: STARTED **2/23/21** COMPLETED: **2/23/21**
INSTALLATION: STARTED **2/23/21** COMPLETED: **2/23/21**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted IR**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Direct Push Macrocore**

NORTHING (ft): **220620** EASTING (ft): **2682522**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **25**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1** BOREHOLE DIAMETER (in): **4**
LOGGED BY: **J. Kachel** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			Air Knife							
5			No Sampling							
8		GW-SW	GW-SW; GRAVEL (Cape May, coarse) to SAND (multicolored, medium), silt (trace, few fines), mudstone clasts (moist)			2		39		
12		GW-SW	GW-SW; SAA, mostly sand, gravel (some, fine to coarse, rounded), silt (trace) (moist)			4		27 36 73 63		
16		GW-SW	GW-SW; SAA (light gray), gravel (very few coarse) (moist)			4		88 76 48		
18		GW-SW	GW-SW; SAA (orangish brown)							
20		GW-SW	GW-SW; SAA			3				
24		SW	SW; SAND (dark brown grading to black, fine) (wet)							
25			End of Boring							

Bentonite
#2 Sand
4" Plastic Screen and 1/4" Plastic Tubing
4" Plastic Screen and 1/4" Plastic Tubing

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **UDEX-VP-1B**
PAGE 1 OF 1

Stantec

DRILLING: STARTED **2/17/21** COMPLETED: **2/23/21**
INSTALLATION: STARTED **2/23/21** COMPLETED: **2/23/21**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted IR**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Direct Push Macrocore MC5**

NORTHING (ft): **220602** EASTING (ft): **2682502**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **18**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1** BOREHOLE DIAMETER (in): **4**
LOGGED BY: **A Klingbeil, Dana H.** CHECKED BY: **J. Kachel**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			Air Knife							
5			No Sampling						5	Bentonite
10		SP	SP; SAND (grayish brown to reddish yellow, fine to medium), gravel (little coarse, little fine) SILT (trace to no) (damp)					11.3	10	#2 Sand; 4" Plastic Screen and 1/4" Plastic Tubing
12		GM	GM; SILTY GRAVEL (very coarse), silt (some to trace), silt (trace to little lenses) (damp)			3.2		19.9		
14		GW-GM	GW-GM; GRAVEL (reddish ???, fine to very coarse), sand (some coarse to fine), silt (trace to little) (damp to moist)					14		
15								32.6	15	
18			End of Boring							4" Plastic Screen and 1/4" Plastic Tubing
20									20	

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-VP-1C**

Stantec

DRILLING: STARTED **2/23/21** COMPLETED: **2/24/21**
INSTALLATION: STARTED **2/24/21** COMPLETED: **2/24/21**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted IR**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Direct Push Macrocore**

NORTHING (ft): **220572** EASTING (ft): **2682530**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **19**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1** BOREHOLE DIAMETER (in): **4**
LOGGED BY: **J. Kachel** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			Air Knife							
5			No Sampling						5	Bentonite
9		SPG	SPG; FILL [sandy gravel]					22.5		#2 Sand
10		SW	SW; SAND (fine) (moist)					1.6	10	4" Plastic Screen and 1/4" Plastic Tubing
11		SP	SP; SAND (fine to medium, no fines) (moist)			2.5		9.3		
12								23.9		
13		SP	SP; SAND (Cape May, multicolored, fine), gravel (coarse), (moist), mudstone clasts (red)					36.8		
14		SP	SP; SAA (moist)					19.5		
15								23.8	15	
16			(0.5' sandy lens)			3.3		288		
17								87		
18								186		4" Plastic Screen and 1/4" Plastic Tubing
19			(0.5' sandy lens) End of Boring					236		
20									20	

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-VP-2A**

Stantec

DRILLING: STARTED **2/24/21** COMPLETED: **2/26/21**
INSTALLATION: STARTED **2/26/21** COMPLETED: **2/26/21**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted IR/Geoprobe 7822DT**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Direct Push Macrocore**

NORTHING (ft): **220294** EASTING (ft): **2682205**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **20**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1** BOREHOLE DIAMETER (in): **4**
LOGGED BY: **J. Kachel** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			Air Knife							
5		CL-ML	CL-ML; SILTY CLAY (Cape May), gravel (little)					0	5	
6		SP	SP; SAND (fine to medium), gravel (some, varicolored)							
		SP	SP; SAND (grayish brown with brown bands, fine)					0		
7						2.8				
8		SP	SP; SAND (fine to medium), gravel (some, varicolored)							
10		SP	SP; SAA (light grayish brown with orange brown intervals), clayey lens (moist)					2	10	
12						3.2				
13								7		
15		SP	SP; SAA (dark black)					6	15	
16								>1000		
17			Sand with gravel lens (fine)			3.5				
18								>1000		
20			End of Boring					497	20	

Bentonite
#2 Sand
4" Plastic Screen and 1/4" Plastic Tubing

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO:
PAGE 1 OF 1 **UDEX-VP-2B**

Stantec

DRILLING: STARTED **2/24/21** COMPLETED: **2/26/21**
INSTALLATION: STARTED **2/26/21** COMPLETED: **2/26/21**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted IR/Geoprobe 7822DT**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Direct Push Macrocore**

NORTHING (ft): **220275** EASTING (ft): **2682241**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **15**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1** BOREHOLE DIAMETER (in): **4**
LOGGED BY: **J. Kachel** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			Air Knife							
5		SC	SC; SAND (Cape May, light gray grading to orangish brown, fine to coarse), gravel (fine)			2.5		0 7	5	Bentonite #2 Sand 4" Plastic Screen and 1/4" Plastic Tubing
10		SC	SC; SAA (fine)					42 5	10	
12		SC	SC; SAND (broken quartz fragments)							
13		SC	SC; SAND (Cape May, light gray grading to orangish brown, fine to coarse), gravel (fine)					7		
15			End of Boring					648	15	
20									20	

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **UDEX-VP-2C**
PAGE 1 OF 1

Stantec

DRILLING: STARTED **2/24/21** COMPLETED: **2/26/21**
INSTALLATION: STARTED **2/26/21** COMPLETED: **2/26/21**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted IR/Geoprobe 7822DT**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Direct Push Macrocore**

NORTHING (ft): **220243** EASTING (ft): **2682196**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **17**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1** BOREHOLE DIAMETER (in): **4**
LOGGED BY: **J. Kachel** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			Air Knife							
5		SC	SC; SAND (Cape May, gray grading to grayish brown, fine to coarse), gravel (multicolored)					3	5	Bentonite
						2		6		#2 Sand; 4" Plastic Screen and 1/4" Plastic Tubing
10			No Recovery					27	10	
15		SP	SP; SAND (fine), 0.2" LNAPL			0.5			15	
17			End of Boring							
20									20	

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **UDEX-VP-3A**
PAGE 1 OF 1

Stantec

DRILLING: STARTED **2/24/21** COMPLETED: **2/24/21**
INSTALLATION: STARTED **2/24/21** COMPLETED: **2/24/21**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted IR/Geoprobe 7822DT**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Direct Push Macrocore**

NORTHING (ft): **220643** EASTING (ft): **2682306**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **25**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1** BOREHOLE DIAMETER (in): **4**
LOGGED BY: **J. Kachel** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			Air Knife							
5		ML	ML; SILT (red and gray layered), mudstone clast at 6' (red)							
6		SP	SP; SAND (brownish gray, fine to medium), gravel (some, fine to medium, rounded) (few to no fines) (wet)					0.5		
7						2.5		8.2		
8								10.3		#2 Sand
9		SP	SP; SAA					14.8		4" Plastic Screen and 1/4" Plastic Tubing
10								51.8	10	
11			(light grayish tan) (moist)			3		9.9		
12			(orangish brown)					216		
13		SP	SP; SAA (orangish brown)					91.8		
14								109		
15						2.2		240	15	
16								276		
17		SP	SP; SAA (wet)					558		
18								250		
19						3.2		475		
20								1299	20	
21			(fine sand) No Recovery					2670		
22										
23						0				
24										
25			End of Boring						25	

Bentonite

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **UDEX-VP-3B**
PAGE 1 OF 1

Stantec

DRILLING: STARTED **2/24/21** COMPLETED: **2/25/21**
INSTALLATION: STARTED **2/25/21** COMPLETED: **2/25/21**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted IR/Geoprobe 7822DT**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Direct Push Macrocore**

NORTHING (ft): **220602** EASTING (ft): **2682288**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **20**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1** BOREHOLE DIAMETER (in): **4**
LOGGED BY: **J. Kachel** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			Air Knife							
5		SP	SP; SAND (Cape May, multicolored, fine to medium), gravel (coarse) (dry)					190	5	
7						2.3		0		
8		ML	ML; SILT (gray, soft) (moist)							
10								0	10	
10		SP	SP; SAND (Cape May, medium gray), ??? (some, brown), gravel (trace, fine)					0		
12		SP	SP; SAND (multicolored, fine to coarse), gravel (fine to coarse) (moist)			2.5		0		
15								0	15	
15								0		
16		SP	SP; SAND (clean fine), mudstone clast at 17'							
17		SP	SP; SAND (orange, fine to coarse), gravel (fine to coarse) (moist)			3		0		
20			End of Boring					0	20	

Bentonite
#2 Sand
4" Plastic Screen and 1/4" Plastic Tubing

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

PROJECT: **PESRM UDEX Release**
LOCATION: **Former PES Refinery**
PROJECT NUMBER: **195603450**

WELL / PROBEHOLE / BOREHOLE NO: **UDEX-VP-3C**
PAGE 1 OF 1

Stantec

DRILLING: STARTED **2/24/21** COMPLETED: **2/25/21**
INSTALLATION: STARTED **2/25/21** COMPLETED: **2/25/21**
DRILLING COMPANY: **Parratt Wolff**
DRILLING EQUIPMENT: **Truck-Mounted IR**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Direct Push Macrocore**

NORTHING (ft): **220592** EASTING (ft): **2682330**
LATITUDE: LONGITUDE:
GROUND ELEV (ft): **--** TOC ELEV (ft): **--**
INITIAL DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **25**
STATIC DTW (ft): WELL DEPTH (ft):
WELL CASING DIAMETER (in): **1** BOREHOLE DIAMETER (in): **4**
LOGGED BY: **J. Kachel** CHECKED BY: **A Klingbeil**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			Air Knife							
5		SP	SP; SAND (Cape May, multicolored light grayish, fine to medium) (dry to moist)					10.3	5	Bentonite
						2.3		0		
								0		#2 Sand
								0		4" Plastic Screen and 1/4" Plastic Tubing
10								0	10	
								5.6		
12		CH	CH; CLAY (reddish gray) (plastic) (moist)			3.4		20.8		
13		SP	SP; SAND (Cape May, orangish brown, fine) (dry to moist)					49.2		
								54		
15								0	15	
								0		
17			Less gravel 17-18'			3.2		0		
								5		
								10		
20									20	
								847		
22			(wet)			2.5				
								36.7		
25			End of Boring					87	25	
26										
27										

GEO FORM 304 213403039_UDEX_2023.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/25

LOG of BORING and MONITORING WELL CONSTRUCTION DETAILS

Project : Chevron/Philadelphia Refinery

Boring/Well No. - BF99

Project No. 113-950-032

Date M.W. completed 10/21/86

Supervising D & M Geologist David Wagner

Location -	Chevron Refinery
Driller -	Lambert, Inc.
Drilling Completed -	10/21/86
Type of Rig -	Hollow Stem Auger

CONSTRUCTION DATA

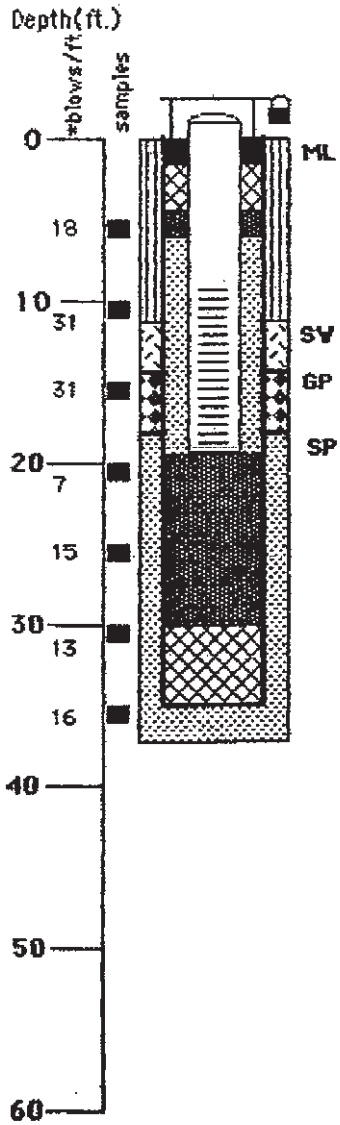
Borehole Diam. -	10"
Borehole Depth -	35'
Casing/Screen Type -	PVC
Casing Diam. -	4"
Casing Depth -	19.5'
Screen Setting -	9.5' - 19.5'
Slot Width -	0.02"
Type of Seal -	Bentonite
Type of Filterpack -	#2 Sand
Type of Grout -	

MEASUREMENTS(NGVD)

Top of Casing Elevation -	13.37'
Static Water Level Elevation -	2.28'
Date Measured -	1/14/87
Surface Elevation -	12.62'

TEST DATA

Pump Type -	
Depth to Intake (ft) -	
Satic Water Level (ft) -	
Pumping Water Level (ft) -	
Drawdown (ft) -	
Length of Test (Hrs) -	



Description

Silt with little to some fine sand, trace clay, medium brown, medium dense, moist; organics

Fine to coarse sand with little fine gravel, medium brown, dense, moist; strong petroleum odor

Fine gravel with little fine to coarse sand, trace silt, medium brown, dense, saturated; strong petroleum odor

Fine to medium sand with trace silt, light brown, loose, saturated

Grading to orange-brown

Trace to little clay and gravel; weak petroleum odor

Fine to coarse sand with trace fine gravel, trace silt, orange-brown, medium dense, saturated

WELL CONSTRUCTION KEY

- FILTER PACK
- BENTONITE SEAL
- BENTONITE GROUT
- CAVE IN MATERIAL
- CONCRETE

Notes:

* Blows taken using a 140 lb hammer falling 30 inches.

** All soils classified by visual inspection.

DAMES & MOORE

BF-103R

LOG of BORING and MONITORING WELL CONSTRUCTION DETAILS

Project : Chevron/Philadelphia Refinery

Boring/Well No. - BF103

Project No. 113-950-032

Date M.W. completed 10/8/86

Supervising D & M Geologist David Wagner

Location -	Chevron Refinery
Driller -	Lambert, Inc.
Drilling Completed -	10/8/86
Type of Rig -	Hollow Stem Auger

CONSTRUCTION DATA

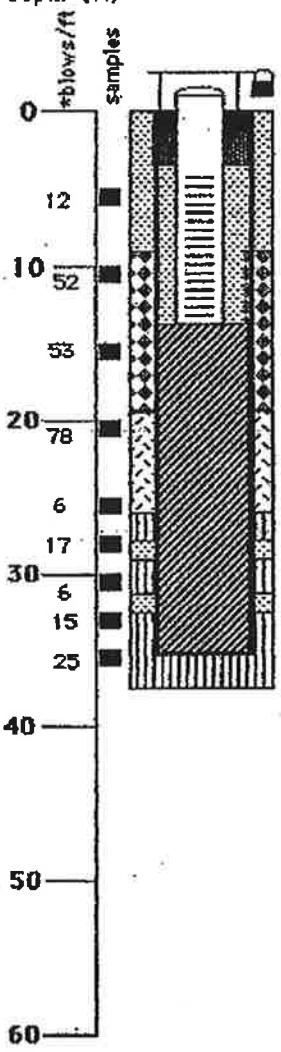
Borehole Diam. -	10"
Borehole Depth -	35'
Casing/Screen Type -	PVC
Casing Diam. -	4"
Casing Depth -	14'
Screen Setting -	4' - 14'
Slot Width -	0.02"
Type of Seal -	Bentonite
Type of Filterpack -	#2 Sand
Type of Grout -	Bentonite

MEASUREMENTS(NGVD)

Top of Casing Elevation -	16.73'
Static Water Level Elevation -	2.09'
Date Measured -	1/14/87
Surface Elevation -	13.88'

TEST DATA

Pump Type -	
Depth to Intake (ft) -	
Satic Water Level (ft) -	
Pumping Water Level (ft) -	
Drawdown (ft) -	
Length of Test (Hrs) -	



Depth (ft)	Description
SP	Fine to medium sand, some silt, little fine gravel, brownish-black, medium dense, saturated; brick fragments
GP	Fine gravel with little to some fine to coarse sand, trace silt, light brown, very dense, moist
SW	Fine to coarse sand with trace to little silt, little fine gravel, light brown, very dense, saturated
ML	26'-28' Silt with little fine to medium sand, little clay, gray, grading to reddish-brown toward bottom of spoon, medium stiff, saturated; wood fragments
SP	
ML	
SP	
ML	
	28'-29' Fine to medium sand with trace to little silt, little clay, trace coarse sand, light brown, medium dense, saturated
	29'-31' Silt with little fine to medium sand, trace clay, brownish-gray, medium stiff, saturated
	31'-32' Fine to medium sand with trace to little silt, little clay, trace coarse sand, light brown, loose, saturated
	32'-37' Silt with little clay, trace to little fine sand, gray, soft, saturated

WELL CONSTRUCTION KEY

- FILTER PACK
- BENTONITE SEAL
- BENTONITE GROUT
- CAVE IN MATERIAL
- CONCRETE

Notes:

* Blows taken using a 140 lb hammer falling 30 inches.

** All soils classified by visual inspection.

DAMES & MOORE

MONITORING WELL LOG: C-129 D

PROJECT:	**Sunoco-Philadelphia Refinery**	DRILLING CO.:	**ECDI**
SITE LOCATION:	**AOI-7**	DRILLING METHOD:	**Hollow Stem Auger & Mud Rotary**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Tiffani Doerr/Shaun Sikes**	SCREEN/RISER DIAMETER:	**4-inch**
DATES DRILLED:	**6/22/10-6/25/10**	WELLBORE DIAMETER:	**6.25"**
TOTAL DEPTH:	**66'**	ELEVATION:	**NA**

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0			Clean gravel in top 6" - then black clay and gravel with large brick, asphalt, concrete and wood fill. Water with sheen to ~3' during clearing.	Hand cleared to 8'		
-5						
-10	0.0		(BC=12-21-18-12) 10" Recovery - wet, brn/red sand, gravels and brick (fill)		Grout/bentonite slurry (0'-47')	
	0.0					
	0.0		(BC=8-10-12-8) 12" Recovery - fill to 12.5'. Rest is black/dk brown fine SAND, trace clay, with gravel and brick near 14'.			
	0.0					
	0.1		(BC=10-7-9-12) Coarse mixed sands, trace sandy clay, black to dark brown.			
-15	0.0					
	1.0		(BC=9-15-18-21) 16'-17' same as above. At 17' - Dark gray/brown sandy CLAY, sl micaceous.			
	0.9					
	0.0		(BC=2-2-1-2) Same as above - 19'-20' is fine to med gray/brn Clayey Sand.			
	0.0					
-20	0.0		(BC=3-2-1-1) Same Clayey Sand grading to gray/dk gray CLAY with trace sand, sl micaceous.			
	0.0					

MONITORING WELL LOG: C-129 D

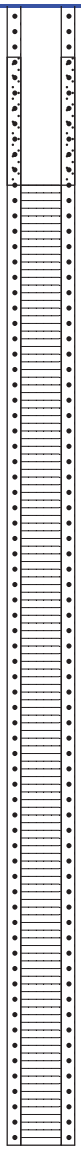
Aquaterra Technologies, Inc.

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
	0.0		(BC=1-2-2-1) Same to 22.5' - then dk brn fine-med Sands with trace clay.			
	0.0					
	0.0		(BC=3-2-2-1) Dark gray/brn CLAY with trace sand.			
-25	0.0					
	0.0		(BC=2-2-2-1) Same with trace organics.			
	0.0					
	0.0		(BC=3-2-1-2) Same as above.			
	0.0					
-30	0.0		(BC=1-1-1-2) Same as above, increased sand content with depth.			
	0.0					
	0.0		(BC=1-1-2-3) Same as above, trace organics, sl micaceous.			
	0.0					
	0.0		(BC=4-8-9-5) Same to 35'. At 35' transition to red/brown fine SAND and GRAVEL.			
-35	0.0					
			(BC=5-5-8-12) No recovery except minor amt reddish-gray clayey fine sand with fine gravel in tip of spoon.			
			(BC=3-8-7-8) Same as above, few fines/clay, few gravels (multi-colored gravels).			
	0.0					
-40			(BC=9-9-8-14) Same as above, clayey fine sand w/ few fine gravels.			
	0.0					
-45			(BC=28-42-100/5) 8" Recovery - 1" of green SILT/fine SAND & 1" of reddish sandy CLAY, then large broken green siltstone and sandstone fragments.			
	0.0				#00 Sand (47'-49')	

MONITORING WELL LOG: C-129 D

Aquaterra Technologies, Inc.

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
-50			(BC=8-14-22-24) Very little recovery - lg gravel (1-2") in pieces and little sand.		#1 Sand (49'-66') Screen (51'-66')	
-55	0.0		(BC=18-17-42-50/2) 6" Recovery - fine-coarse SAND from reddish to yellow.			
-60			Same as above	Mud rotary terminal depth = 69'		
-65			Same as above.			



LOG of BORING and MONITORING WELL CONSTRUCTION DETAILS

Project : Chevron/Philadelphia Refinery

Boring/Well No. - C50D

Project No. 113-950-032

Date M.W. completed 11/4/86

Supervising D & M Geologist David Wagner

Location -	Chevron Refinery
Driller -	Lambert, Inc.
Drilling Completed -	11/4/86
Type of Rig -	Hollow Stem Auger

CONSTRUCTION DATA

Borehole Diam. -	10"
Borehole Depth -	27'
Casing/Screen Type -	PVC
Casing Diam. -	4"
Casing Depth -	26'
Screen Setting -	16' - 26'
Slot Width -	0.02"
Type of Seal -	Bentonite
Type of Filterpack -	#2 Sand
Type of Grout -	

MEASUREMENTS(NGVD)

Top of Casing Elevation -	13.76'
Static Water Level Elevation -	1.43'
Date Measured -	12/22/86
Surface Elevation -	10.97'

TEST DATA

Pump Type -	
Depth to Intake (ft) -	
Satic Water Level (ft) -	
Pumping Water Level (ft) -	
Drawdown (ft) -	
Length of Test (Hrs) -	

Depth (ft)	#blows/ft	samples		Description
0			CL	Clay with some silt, blackish-gray, very soft, saturated; micaceous; organics; petroleum odor
2		■		SHELBY TUBE taken from 7' to 9'
10	2	■	ML	Increased silt; silt with some clay; strong petroleum odor
	40	■	SW	Little to some fine sand
20	11	■		Fine to coarse sand with some fine gravel, medium brown, dense, saturated
	16	■	SP	Increasing gravel; sand and gravel, trace silt and clay
	16	■		Decreased fine gravel; fine to medium sand with trace to little gravel; petroleum odor
30				
40				
50				
60				

WELL CONSTRUCTION KEY

- FILTER PACK
- BENTONITE SEAL
- BENTONITE GROUT
- CAVE IN MATERIAL
- CONCRETE

Notes:

* Blows taken using a 140 lb hammer falling 30 inches.

** All soils classified by visual inspection.

DAMES & MOORE

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BORING LOG

Sheet 1 of 2

Project No. 6445-051-100 Date - Start 3/1/94 0915 Finish 3/3/94 1000 Boring 569D

Project Name Sun Philadelphia Refinery Drilling Co. Empire Drilling Co.

Location adjacent to warehouse - South Yard Drilling Method hollow stem auger

Total Depth 64' Inspector M. Irani Reviewer

Remarks well constructed @ ~63' due to running sands at bottom of boring

Depth Feet	Sample Type & No.	Blows per 6 In.	Depth Range	Rec.	PID ~~Explosimeter~~	Lithologic Description	Equipment Installed
	SS.1	10-15-6-11	~~0-1'~~ 1'-3'		0.5	0-6" asphalt + ballast stone, dk. brown sandy silt	
3'						brown sandy silt w/gravel + quartz pebbles, moist	
	SS.2	3-5-5-6	~~3'-5'~~		0		
4'			3'-5'			brown clayey silt, moist, minor gravel	
	SS.3	4-2-3-9	5'-7'		0		
6'						brown silt, some clay, wet,	
						brown sand w/gravels & pebbles @ last 6" of spoon, very coarse and brownish red	
8'	SS.4	9-20-15-17	7'-9'	poor (4")	0.5	same brown/reddish brown sand w/abundant quartz	
9'						gravels + pebbles	
	SS.5	6-7-6-23	9'-11'	poor	0	poor recovery, orange brown silty clay, moist w/gravels	
11'							
	SS.6	23-38-29-38	11'-13'		0.5	11'-12' brown clayey silt w/gravels	
						-weathered white quartz cobble @ 12' (~3" zone)	
13'						12'-13' mottled sand w/quart gravels + pebbles, coarse,	
	SS.7	50/5	13'-15'		0	some rock frags.	
15'						very coarse brown sand w/abundant qtz gravel + pebbles, wet	
	SS.8	19-24-17-19	15'-17'		0.5	-same w/abundant rock frags	
17'						same, w/ little gravel and pebbles @ 18'-19'	
	SS.9	19-12-9-7	17'-19'		0		
19'							
	SS.10	3-6-7-19	19'-21'		0	-same sand, beginning to run, spoon sample @ 21'-23'	
21'						to not representative	
	SS.11	NA	21'-23'		0	- same sand w/gravel + pebbles (quartz)	
23'	SS.12	15-15-15-16	21'-23'				
25'							
	SS.13	15-10-9-6	25'-27'		0	same, color change to orange brown + reddish brown @ ~26'	
27'							
	SS.14	0-10-14-14	27'-29'		0	same, back to brown	
29'							
	SS.15	3-6-4-6	29'-31'		0	orange brown clay @ 30' interbedded w/ same sand (3" layer of sand)	
31'							
	SS.16	3-6-8-11	31'-33'		0	31'-32' same sand	
33'					~~0~~	32'-33' grayish brown silty clay	
	SS.17	0-56-5	33'-35'		NR	- grayish brown clay interbedded w/ same sand	
35'							
	SS.18	3-6-11-9	35'-37'			-same, interbedded, mostly sand in this spoon	
37'							
	SS.19	12-6-8-15	37'-39'			- all sand, very coarse and large, abundant qtz gravels, large qtz cobble lodged in sampler nose	
39'		22-22-29-30	39'-41'				
	SS.20					- color change to orange brown sand, dk. reddish brown @ [illegible] inches	

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BORING LOG

Sheet 1 of 2

Project No. _____ Date - Start _____ Finish _____ Boring 569D

Project Name _____ Drilling Co. _____

Location _____ Drilling Method _____

Total Depth _____ Inspector _____ Reviewer _____

Remarks _____

Depth Feet	Sample Type & No.	Sample Blows per 6 In.	Sample Depth Range	Sample Rec.	Graphic Log	Lithologic Description	Equipment Installed
41'	SS.21	M-18-19-22	41'-43'			same, frequent color changes, no clay	
43'							
45'	SS.22	12-15-17-N	45'-45'			same sand, no clay	
47'	SS.23	9-8-13-13	45'-47'			same	
50'							
52'	SS.24	0-11-27-50/4	50'-52'			same	
55'							
57'	SS.25	19-28-31-29	55'-57'			same	
60'	SS.26	28-39-50/4	60'-62'			same	
62'							
64'	SS.27	75/0	64-66			auger refusal @ 64', no recovery, end boring	

screen 54'-64'
sand to 49' (running sands)

DTW = 29.5' @ 1250
" ~ 29.35' @ 1340

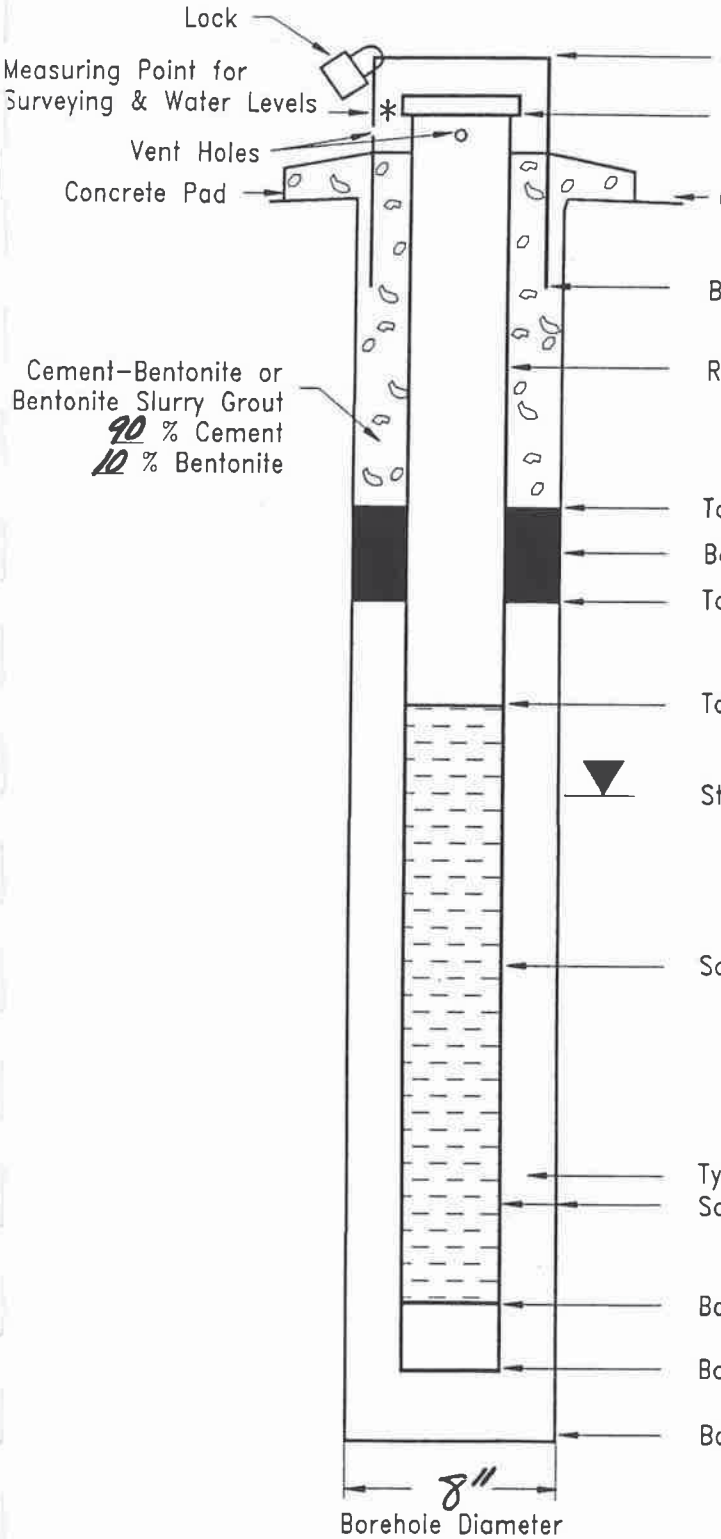
M890278

Project No: 6445-051 Client: Sun Site: Philadelphia Refinery WELL No: 569D

Well Location: adjacent to warehouse Date Installed: 3/2/94

Contractor: Empire Drilling Co. Method: hollow stem auger Inspector: M. Irani

MONITORING WELL CONSTRUCTION DETAIL



		Depth from G.S. (feet)	Elevation (NGVD)
Top of Steel Guard Pipe		~2.5'	
Top of Riser Pipe		~2'	
Ground Surface (G.S.)		0.00	
Bottom of Steel Guard Pipe			
Riser Pipe:			
Length	56'		
Inside Diameter (ID)	2"		
Type of Material	SCH 40 PVC		
Top of Bentonite Seal		~45'	
Bentonite Seal Thickness	3"		
Top of Sand		49'	
Top of Screen		54'	
Stabilized Water Level			
Screen:			
Length	10'		
Inside Diameter (ID)	2"		
Slot Size	0.01"		
Type of Material	SCH 40 PVC		
Type/Size of Sand	Morie #1		
Sand Pack Thickness	3"		
Bottom of Screen		64'	
Bottom of Tail Pipe:			
Length	6"		
Bottom of Borehole		64'	

Approved:

* Describe Measuring Point: Top of PVC casing

Mark J. Irani 3/2/94
Signature Date

ENSR®

MONITORING WELL LOG: S-280 D

PROJECT:	Sunoco-Philadelphia Refinery	DRILLING CO.:	ECDI
SITE LOCATION:	AOI-3	DRILLING METHOD:	Hollow Stem Auger & Mud Rotary
JOB NO.:		SAMPLING METHOD:	Split Spoon
LOGGED BY:	Tiffani Doerr/Shaun Sikes	SCREEN/RISER DIAMETER:	4-inch
DATES DRILLED:	5/11/10-5/14/10	WELLBORE DIAMETER:	6.25"
TOTAL DEPTH:	61'	ELEVATION:	NA

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0			Fill Material	Hand cleared to 10'		
			Surface to 1' - black/brown sandy gravel.			
			Brick layer from 1.5' to 2.5'.			
-5				PID malfunction, limited field sceening data		
			Rest of fill to 10' is large gravel w/ sandy and clay, brown, no odors.			
-10			(BC=6-8-9-6) Orange-brown and gray brown very fine sandy SILT, trace round gravels		Grout/bentonite slurry (0'-49')	
			(BC=8-10-12-15) Same as above, all orange-brown color from 12'-13', all gray-brown color 13'-14'.			
-15			(BC=8-12-12-15) Same as above, Orange brown SAND and GRAVEL, angular to subround, few fines.			
			(BC=8-12-16-15) Tight sand and gravel, overall orange brown color, gravels multicolored up to 0.5 inch.			

MONITORING WELL LOG: S-280 D

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
			(BC=10-13-10-14) Same as above			
-20			(BC=11-12-15-13) Same as above, less gravel and more sand, brown in color, moist			
			(BC=6-8-6-7) Orange brown fine SAND.			
			Light gray-brown, very fine sandy CLAY, wet.			
			(BC=6-9-15-15) Red-brown SAND and GRAVEL with fine to coarse sand and gravel up to 1 inch, some clays			
-25			(BC=7-10-12-13) Same as above			
			(BC=6-8-5-5) Light brown to orange-brown slightly plastic, fine SAND.			
-30	0.2		(BC=12-10-11-13) Medium brown, medium SAND and GRAVEL, slight odor (chemical). Gray fine CLAY lenses.			
	0.6					
	0.5		(BC=24-23-31-40) Same as above, same gray fine silt/clay lense holding odor. All else, red brown, medium-coarse sand with some gravel			
	0.5					
	0.2		(BC=24-23-31-40) Same as above, grades to brown-orange fine SAND, plastic silty fine sand			
-35	0.1					
	0.1		(BC=16-27-11-12) Orange-gray CLAY with some fine sand			
	0.3		(BC=5-4-4-6) Same as above			
			(BC=2-2-3-5) Dark gray clay with trace fine sand, trace organics			
-40						

MONITORING WELL LOG: S-280 D

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
	0.1		(BC=3-2-3-4) Same as above, dark gray clay			
	0.3		Few fine sandy layers and trace organics, organic odor			
			(BC=2-2-1-4) Gray fine sandy clay, some silt, trace organics, grading into gray fine sand, some clay with trace silt			
-45			(BC=1-2-5-7) Gray fine sandy clay, some silt grading into light-dark brown fine sand with trace fine subrounded gravel			
			(BC=4-4-3-3) Gray fine clayey SAND, some silt with fine coarse subrounded gravel, trace amounts of course brown sand			
			(BC=2-3-2-3) Orange-gray alternating fine sands, slightly plastic, trace subrounded gravels			
-50			(BC=1-1-1-1) Gray, loose fine sand more plastic clays than above, no gravel		#00 Sand (47'-49')	
			(BC=7-7-12-12) Same as above, more clay content		#1 Sand (49'-61')	
			(BC=7-9-12-12) Dark gray loose sand with mica flakes throughout, trace clay and fine subrounded, subangular gravel, degrading into dark gray fine silty sand with trace clay, moist			
-55			(BC=7-12-21-30) Dark gray-brown fine SAND and GRAVEL, trace silt, moist to wet			
			(BC=25-23-18-25) Red-brown medium dense sand, some fine to coarse subrounded gravel, mica flakes throughout, trace rounded quartzite, wet	Rods broke during rheeming - lost roller bit and >20' rods down hole.	Screen (51'-61')	
-60			(BC=12-30-41-16) Red-brown medium dense fine to coarse sand, some fine to coarse subangular gravel	Grout hole up to 61' and install well.		
			Very stiff CLAY			

MONITORING WELL LOG: S-280 D

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Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
-65			(BC=25-17-21-17) Reddish-brown to yellowish-brown medium dense fine to coarse SAND, some fine to coarse subrounded GRAVEL, wet			
-70			(BC=27-28-43-51) Same as above, roller bit past tough gravel layer, large quartzite in spoon.			
-75			(BC=5-15-14-10) Light brown-gray coarse sand with fine gravel, no odor			
-80			(BC=60-58-59-50/1) Green-gray large quartzite grading into coase sand with gravel, green and red silty fine sand lense, decomposed rock			

MONITORING WELL LOG: S-280 D

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
-85			(BC=46-120/5) Large, pink-gray-yellow quartzite, coarse sand layer, overall gray appearance			
-90			(BC=58-66) @ 92' White clay and muscovite with white quartz fragments, top of weathered bedrock, wissahickon schist.	Mud rotary terminal depth = 93'		

MONITORING WELL LOG: S-283

PROJECT:	**Sunoco-Philadelphia Refinery**	DRILLING CO.:	**Parratt Wolff**
SITE LOCATION:	**AOI-3**	DRILLING METHOD:	**Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**4"**
DATES DRILLED:	**5/17/2010**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**24'**	ELEVATION:	**N/A**

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0				Hand cleared to 8'		
			Cleared to 8' - Fill: orange brown silty sand with gravel, few large brick/concrete block. Dry.			
-5					9' PVC Riser	
	0.0		60% recovery - Orange, medium sand with medium gravel, no odor		Bentonite 4.5-6.5'	
	0.0				Sand 6.5-24'	
-10	0.0		60% recovery - Orange, medium sand with large gravel assorted colors, moist, no odor			
	0.0					
	0.0		70% recovery - Orange medium sand with layer of coarse sand, moist, no odor, micaceous (13') layer of red sand throughout			
	0.0					
	1.6		40% recovery - Same as above,			

MONITORING WELL LOG: S-283

Aquaterra Technologies, Inc.

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
-15	2.6		wet (15') Orange/gray, medium sand with medium gravel, odor, wet, SPH shine on soil			
	0.0		100% recovery - Orange/gray, medium to coarse sand with gravel, wet, odor, staining downward (17') Orange, micaceous			
	0.0					
	5.5		Grayish orange, medium to coarse sand with small gravel, micaceous, wet, odor (19') Orange medium sand with small gravel, no odor			
	1.8					
-20	1.0		70% recovery - Brownish orange medium to coarse sand, wet, odor, coarsing downward (21') Orange, coarse sand with medium gravel, wet, no odor, micaceous		15' PVC Screen	
	0.2					
	0.8		90% recovery - Orange, medium sand, micaceous, wet, odor, few large gravel			
	0.0					

MONITORING WELL LOG: S-284 D

PROJECT:	**Sunoco-Philadelphia Refinery**	DRILLING CO.:	**ECDI**
SITE LOCATION:	**AOI-3**	DRILLING METHOD:	**Hollow Stem Auger & Mud Rotary**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Tiffani Doerr/Shaun Sikes**	SCREEN/RISER DIAMETER:	**4-inch**
DATES DRILLED:	**5/17/10-5/24/10**	WELLBORE DIAMETER:	**6.25"**
TOTAL DEPTH:	**78'**	ELEVATION:	**NA**

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0			Fill Material to 10' - Light brown sandy clay and gravel, some brick and larger concrete block fill.	Hand cleared to 8'		
-5						
-10			(BC=10-12-13-8) 6" Recovery - Loose, saturated, olive-brn, coarse SAND w/ GRAVEL up to 1/2". Various color and composition, sub-round, strong odor.		Grout/bentonite slurry (0'-59')	
	147		(BC=6-8-9-8) No Recovery - lg green qtzite gravel in tip of spoon.			
-15	33.7		(BC=4-5-7-9) 6" Recovery - same as above w/clay lense, slight odor.			
			(BC=7-7-8-9) No Recovery - loose sands and gravel?			

MONITORING WELL LOG: S-284 D

Aquaterra Technologies, Inc.

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
	0.6		(BC=10-12-10-16) 12" Recovery - same in top 6". Bottom 6" yellow-brn med sand getting coarser w/few small gravles at bottom.			
	0.4					
-20	0.0		(BC=5-3-3-4) Top 2" orange very fine sandy CLAY, bottom 20" medium gray clay w/thin very fine lt gray sand layers.			
	0.1					
	0.0		(BC=4-3-6-6) Gray CLAY, some organics.			
	0.0					
	0.0		(BC=4-7-7-5) Same as above, slightly brown hue to CLAY, more organics.			
-25	0.0					
	7.1		(BC=5-7-12-10) 8" Recovery - top 1" gray sand w/few fine gravels, rest is orange medium SAND.			
	4.7		(BC=9-11-21-13) Same as above, but coarser SAND, dense, dark orange to red-brn w/ trace fine Gravels.			
	0.3					
-30			(BC=6-24-28-16) 3" Recovery - orange med-coarse SAND, one 2"+ gravel in tip of spoon.			
	0.0					
	0.0		(BC=4-5-8-12) Dark gray soft CLAY, trace red-brn fine sand, trace organics, moist.			
	0.0					
	0.0		(BC=10-12-12-12) 16" Recovery - reddish brn to orange medium dense fine-coarse SAND, trace sub-rounded qtz gravels, wet.			
-35	0.0					
	0.0		(BC=46-24-7-7) 4" Recovery - dark gray-brn, coarse subangular to subrounded			

MONITORING WELL LOG: S-284 D

Aquaterra Technologies, Inc.

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
	0.0		GRAVEL (possible fall-in).			
	0.0		(BC=6-16-21-19) 6" Recovery - same as above.			
	0.0					
-40	146		(BC=19-11-10-10) 12" Recovery - black stained fine-coarse SAND w/ trace sub-round gravel, petroleum odor. Lower half same composition, but orange, no staining or odors.			
	0.0					
	0.6		(BC=17-28-14-10) Same as above - fine-med sand, orange-lt brn.			
	1.4					
-45	60.5		(BC=19-16-14-13) 9" Recovery - Lt brn med-coarse SAND w/trace fine sub-round gravels, chemical odor.			
	2.2		(BC=12-13-13-14) 6" Recovery - Lg qtzite gravel in tip of spoon. Finer lt brn sand grading into coarse sand w/ some fine gravels.			
	9.0		(BC=12-15-15-17) 12" Recovery - Med-coarse SAND w/trace fine gravels, lt brn at top, orange at bottom - petroleum odors in top 6".			
	1.6					
-50	0.3		(BC=4-17-46-15) 8" Recovery - No odor, orange-brn med-coarse SAND and GRAVEL (up to 1/2"). Few red-brn clayey fine sand lenses.			
	0.5		(BC=14-29-34-39) 12" Recovery - coarse SAND and some GRAVEL (fine to 1"), very dense, orange. Fine red-brn clayey sand nodule - completely degraded gravel.			
	0.4					
-55	1.4		(BC=29-55-50-27) 6" Recovery - same as above, slight petroleum odor.			
	0.0		(BC=15-17-29-21) 6" Recvoery - same as above, no odor.			

MONITORING WELL LOG: S-284 D

Aquaterra Technologies, Inc.

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
			(BC=5-12-39-31) 6" Recovery - same as above, less gravel (trace round, <1/2"), more fines (silt & clay in sand matrix).			
	0.0				#00 Sand (59'-61')	
-60						
					#1 Sand (61'-78')	
			Drill to 65' - driller noted 2 tough drilling layers through gravels.			
					Screen (63'-78')	
-65	0.0		(BC=56-102-17-24) 10" Recovery - Fine orange-brn SAND, some gravel in top 3".			
	0.0					
-70			(BC=9-52-46-43) 4" Recovery - orange-brn SAND and GRAVEL (50/50), no odor.			
	0.1					
-75			Cuttings: orange sand and gravel (up to 1/2") quartz.			

MONITORING WELL LOG: S-284 D

Aquaterra Technologies, Inc.

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
-80			Same as above. Top of weathered schist at 81.5' - collected spoon - 2" recovery - white clay and qtz grains with mica flakes (up to 1/4").	Mud Rotary terminal depth = 82'		

LANGAN

Log of Boring **S-382** Sheet 1 of 2

Project: Sunoco PES Facility	Project No.: 25746012
Location: Philadelphia, Pa	Elevation and Datum: --
Drilling Company: Total Quality Drilling	Date Started: 7/26/13 / Date Finished: 8/2/13
Drilling Equipment: Stainless Steel Hand Auger, Hydrovac Truck, Split Spoon, Hollow Stem Auger	Completion Depth: 28 ft / Rock Depth: NE
Size and Type of Bit	Number of Samples: Disturbed 8 / Undisturbed / Core
Casing Diameter (in): 4 / Casing Depth (ft)	Water Level (ft.): First ▽ 10 / Completion ▼ / 24 HR. ▼
Casing Hammer / Weight (lbs) / Drop (in)	Drilling Foreman: Mike Kavlunas
Sampler: Hand Auger, Split Spoon	Inspecting Engineer: Yavuz Gungor
Sampler Hammer / Weight (lbs) / Drop (in)	

Material Symbol	Elev. (ft)	Sample Description	PID Reading (ppm)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40
		Gravel FILL		0		HA	12		
		Brown gravelly SILT, some sand (dry)	1.7	1	1	HA	6		
						HA	6		
				2		HA	12		
		Brown silty SAND (dry)		3	2	HA	12		
		Light brown SAND (dry)	0.0	4		HA	12		
			0.1	5	3	HA	12		
		Brown fine to coarse SAND (moist)		6	4	HA	12		
				7		HA	12		
				8		HA	12		
				9		HA	12		
		▽		10					
		Stiff gray silty CLAY (wet)	0.0	11		SS	14	0 0 0 0	
		Brown sandy GRAVEL (moist)	0.0	12		SS	18	0 0 0 0	
				13					
		Silty CLAY, some sandy gravel (moist)	0.0	14		SS	6	0 0 0 0	
				15					
		Brown SAND, some gravel, trace silt (wet)		16		SS	NR	0 0 0 0	
				17					
				18		SS	16	0 0 0 0	
			0.0	19					
				20					

Remarks

(Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)

Began boring at 10:30 on 7/26/13.

Collected sample AOI3_S-382_1.5-2_72613 at 10:50.

Collected sample AOI3_S-382_3-4_72613 at 11:00.

Collected sample AOI3_S-382_5-6_72613 at 11:09.

Collected sample AOI3_S-382_6-7_72613 at 12:10.

Paused boring at 9 ft bgs on 7/26/13. Resumed boring at 8:00 on 8/1/13.

No blow counts recorded during the split spoon sampling.

Perched groundwater observed at 10 ft bgs.

\\LANGAN.COM\DATA\DYL\DATA6\257460\1\ENGINEERING DATA\ENVIRONMENTAL\GINT\SUNOCO PES SITEWIDE-MERGED.GPJ ... 6/21/2016 11:08:52 AM ... Report: Log - LANGAN

LANGAN

Log of Boring **S-382** Sheet 2 of 2

Project	Project No.
Sunoco PES Facility	25746012
Location	**Elevation and Datum**
Philadelphia, Pa	--

MATERIAL SYMBOL	Elev. (ft)	Sample Description	PID Reading (ppm)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			0.0	20		SS	18	0 0 0 0	0	
			0.0	21		SS	24	0 0 0 0	0	
			0.0	22		SS	20	0 0 0 0	0	
			0.0	23		SS	16	0 0 0 0	0	
				24						
				25						
				26						
				27						
				28						Ended boring at 28 ft bgs at 10:00 on 8/1/13.
				29						
				30						
				31						
				32						
				33						
				34						
				35						
				36						
				37						
				38						
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				40						
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				45						

\\LANGAN.COM\DATA\DYL\DATA6\25746001\ENGINEERING DATA\ENVIRONMENTAL\GINT\SUNOCO PES SITEWIDE-MERGED.GPJ ... 6/21/2016 11:08:52 AM ... Report: Log - LANGAN

LANGAN

WELL CONSTRUCTION SUMMARY

Well No. S-382

Project: Sunoco PES Facility	Project No.: 25746012
Location: Philadelphia, Pa	Elevation And Datum: --
Drilling Agency: Total Quality Drilling	Date Started: 8/1/2013 / Date Finished: 8/1/2013
Drilling Equipment: Hollow Stem Auger	Driller: Mike Kavalunas
Size And Type of Bit:	Inspector: Pat Troy

Method of Installation

Well S-382 was installed using an 8-inch diameter hollow stem auger on 8/1/2013. The boring was advanced to 28 ft bgs and 15 ft screen and 15 ft of riser were installed. Filter sand was installed to 11 ft bgs. and bentonite seal was installed to 1 ft bgs. Then the well casing was installed and concreted in place.

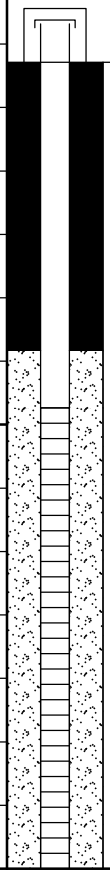
Method of Well Development

Type of Casing: PVC / Diameter: 4 inch	Type of Backfill Material:
Type of Screen: PVC / Diameter: 4 inch	Type of Seal Material: Bentonite
Borehole Diameter: 8 inch	Type of Filter Material: Filter Sand

	Elevation	Depth
Top of Casing		
Top of Seal		0' bgs
Top of Filter		10' bgs
Top of Screen		12' bgs
Bottom of Filter		28' bgs
Bottom of Well		28' bgs
Screen Length: 16.0'		Slot Size: 0.020

GROUNDWATER ELEVATIONS (ft)
(Measured from the Top of Casing)

Elevation	DTW	Date



Soil / Rock Classification	Depth (ft)
Fill	
USCS Silt	
USCS Silty Sand USCS Well-graded Sand	
USCS Well-graded Sand	
	10
USCS Low Plasticity Clay	12
USCS Well-graded Sandy Gravel	
USCS Low Plasticity Clay	
USCS Poorly-graded Sand with Silt	
	28

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PROJECT: **Philly AOI-3 Logs 2015**
LOCATION: **Philly AOI-3**
PROJECT NUMBER:

WELL / PROBEHOLE / BOREHOLE NO: **S-411** PAGE 1 OF 1

DRILLING / INSTALLATION:
STARTED **10/7/15** COMPLETED: **10/21/15**
DRILLING COMPANY: **Total Quality Drillling**
DRILLING EQUIPMENT: **HSA**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft):
EASTING (ft):
LAT:
LONG:
GROUND ELEV (ft):
TOC ELEV (ft):
INITIAL DTW (ft): **Not Encountered**
WELL DEPTH (ft): **30.0**
STATIC DTW (ft): **Not Encountered**
BOREHOLE DEPTH (ft): **30.0**
WELL CASING DIA. (in): **4**
BOREHOLE DIA. (in): **12**
LOGGED BY: **NS**
CHECKED BY: **TD**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
			SANDY CLAY ; dark brown; fine to medium-grained; moist; Fill (bricks, concrete pieces)		S-411 _0-2 1415			0.0		
					S-411@ 2-4'			0.0		
5			**SILTY CLAY** ; gray and orangeish brown; moist; mottled; Utility clearing completed to a depth of 8' bgs via backhoe.		S-411@ 4-6'			0.0	5	1-8.5' bgs: Bentonite
					S-411@ 6-8'			0.0		
			SANDY CLAY LITTLE SAND ; grayish brown; fine to medium-grained; moist		S-411@ 8-10'	2		0.0		
10					Geotech Sample 1030	2			10	
			SAND SOME GRAVEL ; brown; fine to medium-grained; moist; subrounded; (Trenton)		S-411@ 12-14'	0.5		5.9		
15					Geotech Sample 1200	2			15	
			SAND SOME GRAVEL ; brown; fine to medium-grained; moist		S-411@ 16-18'	0.7		52.7		
			No Recovery			0				
20			**SAND AND GRAVEL** ; reddish brown; fine to medium-grained; moist to wet; subrounded		S-411@ 20-22'	0.6		0.0	20	8.5-30' bgs: Sand 10-30' bgs: 30-slot PVC Screen
					S-411@ 22-24'	0.5		0.0		
25					S-411@ 24-26'	2		0.0	25	
					S-411@ 26-28'	0.4		0.0		
			SAND LITTLE GRAVEL ; orangeish brown; fine to medium-grained; saturated; subrounded		S-411@ 28-30'	1.1		0.0		
30			Borehole terminated at 30 feet.						30	
35									35	

GEO FORM 304 PHILLY AOI-3 LOGS 2015.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 1/27/16

PROJECT: **Philly AOI-3 Logs 2015**
LOCATION: **Philly AOI-3**
PROJECT NUMBER:

WELL / PROBEHOLE / BOREHOLE NO: **S-412** PAGE 1 OF 1

DRILLING / INSTALLATION:
STARTED **10/13/15** COMPLETED: **10/19/15**
DRILLING COMPANY: **Total Quality Drillling**
DRILLING EQUIPMENT: **HSA**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft):
EASTING (ft):
LAT:
LONG:
GROUND ELEV (ft):
TOC ELEV (ft):
INITIAL DTW (ft): **Not Encountered**
WELL DEPTH (ft): **30.0**
STATIC DTW (ft): **Not Encountered**
BOREHOLE DEPTH (ft): **30.0**
WELL CASING DIA. (in): **4**
BOREHOLE DIA. (in): **12**
LOGGED BY: **NS/LM**
CHECKED BY: **TD**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
			SANDY GRAVEL LITTLE SILT ; brown; medium to coarse-grained; dry; subangular; Fill (bricks, debris)		0915 S-412 _0-2			1		
			SANDY SILT LITTLE GRAVEL ; yellowish brown; fine to medium-grained; loose; dry; subangular		S-412@ 2-4'			0.0		
5					S-412@ 4-6'			0.0	5	1-8' bgs: Bentonite
			SAND LITTLE GRAVEL AND SILT ; yellowish brown; fine to medium-grained; moist; subrounded; Utility clearing completed to a depth of 8' bgs via backhoe.		S-412@ 6-8'			1		
			SANDY SILT ; brown to gray		S-412@ 8-10'			0.0		
10			**SAND** ; gray; Alluvial shelby tube collected		Geotech Sample			8.2	10	
			GRAVEL ; gray; Trenton shelby tube collected		Geotech Sample			11.7		
			SILT AND GRAVEL ; brownish gray; wet		S-412 _14-16			641.7		
15			**GRAVEL AND SILT** ; reddish brown		S-412@ 16-18'			503	15	
			GRAVELLY SILT AND SAND ; reddish brown		S-412@ 18-20'			330.1		8-30' bgs: Sand 10-30' bgs: 30-slot PVC Screen
20			**SILTY SAND** ; reddish brown		S-412@ 20-22'			150.7	20	
			SILTY SAND WITH GRAVEL ; reddish brown		S-412@ 22-24'			136		
25			**SILTY SAND** ; reddish brown		S-412@ 24-26'			207	25	
			SAND AND GRAVEL ; reddish orange and tannish brown		S-412@ 26-28'			40		
			SANDY SILT ; grayish orange		S-412@ 28-30'			56		
30			Borehole terminated at 30 feet.						30	
35									35	

GEO FORM 304 PHILLY AOI-3 LOGS 2015.GPJ STANITEC ENVIRO TEMPLATE 010509.GDT 1/27/16

PROJECT: **Philly AOI-3 Logs 2015**
LOCATION: **Philly AOI-3**
PROJECT NUMBER:

WELL / PROBEHOLE / BOREHOLE NO: **S-414** PAGE 1 OF 1

DRILLING / INSTALLATION:
STARTED **10/7/15** COMPLETED: **10/16/15**
DRILLING COMPANY: **Total Quality Drillling**
DRILLING EQUIPMENT: **HSA**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split Spoon**

NORTHING (ft):
LAT:
GROUND ELEV (ft):
INITIAL DTW (ft): **Not Encountered**
STATIC DTW (ft): **Not Encountered**
WELL CASING DIA. (in): **4**
LOGGED BY: **NS**

EASTING (ft):
LONG:
TOC ELEV (ft):
WELL DEPTH (ft): **30.0**
BOREHOLE DEPTH (ft): **30.0**
BOREHOLE DIA. (in): **12**
CHECKED BY: **TD**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
			SANDY GRAVEL LITTLE SILT ; brown; medium to coarse-grained; dry; subangular; Fill		1200 S-414 _0-2			19		
			SILT LITTLE CLAY LITTLE SAND ; dark brown; fine to medium-grained; moist		S-414@ 2-4'			1		
5			**SANDY SILT LITTLE CLAY** ; gray; fine to medium-grained; moist		S-414@ 4-6'			9	5	1-8.5' bgs: Bentonite
			SAND AND GRAVEL ; reddish brown; fine to coarse-grained; moist; subrounded; Utility clearing completed to a depth of 8' bgs via backhoe.		S-414@ 6-8'			9		
			CLAYEY SAND ; brown; fine to medium-grained; moist		S-414@ 8-10'	0.2		6.4		
10			**SAND LITTLE GRAVEL** ; light tan; fine to medium-grained; moist; subrounded		S-414@ 10-12'	0.5		1303.7	10	
			SAND LITTLE GRAVEL ; dark reddish brown; fine to medium-grained; moist		S-414@ 12-14'	0.2		298.4		
15					S-414@ 14-16'	0.2		259.3	15	
					S-414@ 16-18'	0.9		2834		
					S-414@ 18-20'	0.5		705		8.5-30' bgs: Sand 10-30' bgs: 30-slot PVC Screen
20			**SAND AND GRAVEL** ; grayish brown; fine to medium-grained; moist to wet; subrounded; (Trenton)		1315 S-414 _20-22	1.3		2853	20	
					S-414@ 22-24'	0.3		258.6		
25					S-414@ 24-26'	0.4		67.9	25	
					S-414@ 26-28'	0.5		48.7		
					S-414@ 28-30'	1		16.2		
30			Borehole terminated at 30 feet.						30	
35									35	

GEO FORM 304 PHILLY AOI-3 LOGS 2015.GPJ STANITEC ENVIRO TEMPLATE 010509.GDT 1/27/16

Appendix E Groundwater Laboratory Reports

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ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

PES c/o Stantec
1060 Andrew Drive
Suite 140
West Chester PA 19380

Report Date: March 07, 2019 21:45

Project: PES Reformate GWs

Account #: 42093
Group Number: 2031386
PO Number: PES REFORMATE
State of Sample Origin: PA

Electronic Copy To	PES c/o Stantec	Attn: Andrew Bradley
Electronic Copy To	PES c/o Stantec	Attn: Andrew Klingbeil

Respectfully Submitted,

Amek Carter
Specialist

(717) 556-7252

To view our laboratory's current scopes of accreditation please go to https://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/certifications-and-accreditations-eurofins-lancaster-laboratories-environmental/ . Historical copies may be requested through your project manager.



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SAMPLE INFORMATION

Client Sample Description	Sample Collection Date/Time	ELLE#
S-283_20190226 Grab Groundwater	02/26/2019 09:05	9995284
S-430_20190226 Grab Groundwater	02/26/2019 10:15	9995285
S-431_20190226 Grab Groundwater	02/26/2019 11:00	9995286
S-429_20190226 Grab Groundwater	02/26/2019 12:10	9995287
S-382_20190226 Grab Groundwater	02/26/2019 13:10	9995288
S-414_20190226 Grab Groundwater	02/26/2019 14:15	9995289
TRIP BLANK Water	02/21/2019	9995290

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Sample Description: **S-283_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 09:05

PES c/o Stantec
ELLE Sample #: WW 9995284
ELLE Group #: 2031386
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	
10335	Acetone	67-64-1	N.D.		160	200
10335	Benzene	71-43-2	380,000		400	2000
10335	Bromodichloromethane	75-27-4	N.D.		40	200
10335	Bromoform	75-25-2	N.D.		400	200
10335	Bromomethane	74-83-9	N.D.		100	200
10335	2-Butanone	78-93-3	N.D.		200	200
10335	Carbon Disulfide	75-15-0	N.D.		60	200
10335	Carbon Tetrachloride	56-23-5	N.D.		40	200
10335	Chlorobenzene	108-90-7	N.D.		40	200
10335	Chloroethane	75-00-3	N.D.		60	200
10335	Chloroform	67-66-3	N.D.		40	200
10335	Chloromethane	74-87-3	N.D.		60	200
10335	Cyclohexane	110-82-7	N.D.		400	200
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.		200	200
10335	Dibromochloromethane	124-48-1	N.D.		80	200
10335	1,2-Dibromoethane	106-93-4	N.D.		60	200
10335	1,2-Dichlorobenzene	95-50-1	N.D.		40	200
10335	1,3-Dichlorobenzene	541-73-1	N.D.		40	200
10335	1,4-Dichlorobenzene	106-46-7	N.D.		40	200
10335	Dichlorodifluoromethane	75-71-8	N.D.		60	200
10335	1,1-Dichloroethane	75-34-3	N.D.		40	200
10335	1,2-Dichloroethane	107-06-2	N.D.		400	200
10335	1,1-Dichloroethene	75-35-4	N.D.		40	200
10335	cis-1,2-Dichloroethene	156-59-2	N.D.		40	200
10335	trans-1,2-Dichloroethene	156-60-5	N.D.		40	200
10335	1,2-Dichloropropane	78-87-5	N.D.		40	200
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.		40	200
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.		40	200
10335	Ethylbenzene	100-41-4	97	J	40	200
10335	Freon 113	76-13-1	N.D.		400	200
10335	2-Hexanone	591-78-6	N.D.		600	200
10335	Isopropylbenzene	98-82-8	N.D.		60	200
10335	Methyl Acetate	79-20-9	N.D.		120	200
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		40	200
10335	4-Methyl-2-pentanone	108-10-1	N.D.		100	200
10335	Methylcyclohexane	108-87-2	120	J	40	200
10335	Methylene Chloride	75-09-2	170	J B	40	200
10335	Styrene	100-42-5	N.D.		40	200
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.		40	200
10335	Tetrachloroethene	127-18-4	N.D.		40	200
10335	Toluene	108-88-3	84,000		400	2000
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.		80	200
10335	1,1,1-Trichloroethane	71-55-6	N.D.		40	200
10335	1,1,2-Trichloroethane	79-00-5	N.D.		40	200
10335	Trichloroethene	79-01-6	N.D.		40	200
10335	Trichlorofluoromethane	75-69-4	N.D.		80	200
10335	Vinyl Chloride	75-01-4	N.D.		80	200
10335	Xylene (Total)	1330-20-7	240	J	100	200

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Sample Description: **S-283_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 09:05

PES c/o Stantec
ELLE Sample #: WW 9995284
ELLE Group #: 2031386
Matrix: Groundwater

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190641AA	03/05/2019 16:13	Jennifer K Howe	200
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190641AA	03/05/2019 16:36	Jennifer K Howe	2000
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190641AA	03/05/2019 16:12	Jennifer K Howe	200
01163	GC/MS VOA Water Prep	SW-846 5030B	2	Y190641AA	03/05/2019 16:35	Jennifer K Howe	2000

Sample Description: **S-430_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 10:15

PES c/o Stantec
ELLE Sample #: WW 9995285
ELLE Group #: 2031386
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	
10335	Acetone	67-64-1	N.D.		160	200
10335	Benzene	71-43-2	160,000		400	2000
10335	Bromodichloromethane	75-27-4	N.D.		40	200
10335	Bromoform	75-25-2	N.D.		400	200
10335	Bromomethane	74-83-9	N.D.		100	200
10335	2-Butanone	78-93-3	N.D.		200	200
10335	Carbon Disulfide	75-15-0	N.D.		60	200
10335	Carbon Tetrachloride	56-23-5	N.D.		40	200
10335	Chlorobenzene	108-90-7	N.D.		40	200
10335	Chloroethane	75-00-3	N.D.		60	200
10335	Chloroform	67-66-3	N.D.		40	200
10335	Chloromethane	74-87-3	N.D.		60	200
10335	Cyclohexane	110-82-7	N.D.		400	200
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.		200	200
10335	Dibromochloromethane	124-48-1	N.D.		80	200
10335	1,2-Dibromoethane	106-93-4	N.D.		60	200
10335	1,2-Dichlorobenzene	95-50-1	N.D.		40	200
10335	1,3-Dichlorobenzene	541-73-1	N.D.		40	200
10335	1,4-Dichlorobenzene	106-46-7	N.D.		40	200
10335	Dichlorodifluoromethane	75-71-8	N.D.		60	200
10335	1,1-Dichloroethane	75-34-3	N.D.		40	200
10335	1,2-Dichloroethane	107-06-2	N.D.		400	200
10335	1,1-Dichloroethene	75-35-4	N.D.		40	200
10335	cis-1,2-Dichloroethene	156-59-2	N.D.		40	200
10335	trans-1,2-Dichloroethene	156-60-5	N.D.		40	200
10335	1,2-Dichloropropane	78-87-5	N.D.		40	200
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.		40	200
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.		40	200
10335	Ethylbenzene	100-41-4	40	J	40	200
10335	Freon 113	76-13-1	N.D.		400	200
10335	2-Hexanone	591-78-6	N.D.		600	200
10335	Isopropylbenzene	98-82-8	N.D.		60	200
10335	Methyl Acetate	79-20-9	N.D.		120	200
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		40	200
10335	4-Methyl-2-pentanone	108-10-1	N.D.		100	200
10335	Methylcyclohexane	108-87-2	N.D.		40	200
10335	Methylene Chloride	75-09-2	150	J B	40	200
10335	Styrene	100-42-5	N.D.		40	200
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.		40	200
10335	Tetrachloroethene	127-18-4	N.D.		40	200
10335	Toluene	108-88-3	59,000		40	200
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.		80	200
10335	1,1,1-Trichloroethane	71-55-6	N.D.		40	200
10335	1,1,2-Trichloroethane	79-00-5	N.D.		40	200
10335	Trichloroethene	79-01-6	N.D.		40	200
10335	Trichlorofluoromethane	75-69-4	N.D.		80	200
10335	Vinyl Chloride	75-01-4	N.D.		80	200
10335	Xylene (Total)	1330-20-7	N.D.		100	200

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Sample Description: **S-430_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 10:15

PES c/o Stantec
ELLE Sample #: WW 9995285
ELLE Group #: 2031386
Matrix: Groundwater

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190642AA	03/05/2019 22:00	Patrick T Herres	200
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190642AA	03/05/2019 22:22	Patrick T Herres	2000
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190642AA	03/05/2019 21:59	Patrick T Herres	200
01163	GC/MS VOA Water Prep	SW-846 5030B	2	Y190642AA	03/05/2019 22:21	Patrick T Herres	2000

Sample Description: **S-431_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 11:00

PES c/o Stantec
ELLE Sample #: WW 9995286
ELLE Group #: 2031386
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	
10335	Acetone	67-64-1	N.D.		160	200
10335	Benzene	71-43-2	590,000		400	2000
10335	Bromodichloromethane	75-27-4	N.D.		40	200
10335	Bromoform	75-25-2	N.D.		400	200
10335	Bromomethane	74-83-9	N.D.		100	200
10335	2-Butanone	78-93-3	N.D.		200	200
10335	Carbon Disulfide	75-15-0	N.D.		60	200
10335	Carbon Tetrachloride	56-23-5	N.D.		40	200
10335	Chlorobenzene	108-90-7	N.D.		40	200
10335	Chloroethane	75-00-3	N.D.		60	200
10335	Chloroform	67-66-3	N.D.		40	200
10335	Chloromethane	74-87-3	N.D.		60	200
10335	Cyclohexane	110-82-7	N.D.		400	200
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.		200	200
10335	Dibromochloromethane	124-48-1	N.D.		80	200
10335	1,2-Dibromoethane	106-93-4	N.D.		60	200
10335	1,2-Dichlorobenzene	95-50-1	N.D.		40	200
10335	1,3-Dichlorobenzene	541-73-1	N.D.		40	200
10335	1,4-Dichlorobenzene	106-46-7	N.D.		40	200
10335	Dichlorodifluoromethane	75-71-8	N.D.		60	200
10335	1,1-Dichloroethane	75-34-3	N.D.		40	200
10335	1,2-Dichloroethane	107-06-2	N.D.		400	200
10335	1,1-Dichloroethene	75-35-4	N.D.		40	200
10335	cis-1,2-Dichloroethene	156-59-2	N.D.		40	200
10335	trans-1,2-Dichloroethene	156-60-5	N.D.		40	200
10335	1,2-Dichloropropane	78-87-5	N.D.		40	200
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.		40	200
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.		40	200
10335	Ethylbenzene	100-41-4	N.D.		40	200
10335	Freon 113	76-13-1	N.D.		400	200
10335	2-Hexanone	591-78-6	N.D.		600	200
10335	Isopropylbenzene	98-82-8	N.D.		60	200
10335	Methyl Acetate	79-20-9	N.D.		120	200
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		40	200
10335	4-Methyl-2-pentanone	108-10-1	N.D.		100	200
10335	Methylcyclohexane	108-87-2	67	J	40	200
10335	Methylene Chloride	75-09-2	150	J B	40	200
10335	Styrene	100-42-5	N.D.		40	200
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.		40	200
10335	Tetrachloroethene	127-18-4	N.D.		40	200
10335	Toluene	108-88-3	59,000		40	200
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.		80	200
10335	1,1,1-Trichloroethane	71-55-6	N.D.		40	200
10335	1,1,2-Trichloroethane	79-00-5	N.D.		40	200
10335	Trichloroethene	79-01-6	N.D.		40	200
10335	Trichlorofluoromethane	75-69-4	N.D.		80	200
10335	Vinyl Chloride	75-01-4	N.D.		80	200
10335	Xylene (Total)	1330-20-7	N.D.		100	200

Sample Description: **S-431_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 11:00

PES c/o Stantec
ELLE Sample #: WW 9995286
ELLE Group #: 2031386
Matrix: Groundwater

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190642AA	03/05/2019 22:44	Patrick T Herres	200
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190642AA	03/05/2019 23:06	Patrick T Herres	2000
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190642AA	03/05/2019 22:43	Patrick T Herres	200
01163	GC/MS VOA Water Prep	SW-846 5030B	2	Y190642AA	03/05/2019 23:05	Patrick T Herres	2000

Sample Description: **S-429_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 12:10

PES c/o Stantec
ELLE Sample #: WW 9995287
ELLE Group #: 2031386
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	
10335	Acetone	67-64-1	N.D.		160	200
10335	Benzene	71-43-2	480,000		400	2000
10335	Bromodichloromethane	75-27-4	N.D.		40	200
10335	Bromoform	75-25-2	N.D.		400	200
10335	Bromomethane	74-83-9	N.D.		100	200
10335	2-Butanone	78-93-3	N.D.		200	200
10335	Carbon Disulfide	75-15-0	N.D.		60	200
10335	Carbon Tetrachloride	56-23-5	N.D.		40	200
10335	Chlorobenzene	108-90-7	N.D.		40	200
10335	Chloroethane	75-00-3	N.D.		60	200
10335	Chloroform	67-66-3	N.D.		40	200
10335	Chloromethane	74-87-3	N.D.		60	200
10335	Cyclohexane	110-82-7	N.D.		400	200
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.		200	200
10335	Dibromochloromethane	124-48-1	N.D.		80	200
10335	1,2-Dibromoethane	106-93-4	N.D.		60	200
10335	1,2-Dichlorobenzene	95-50-1	N.D.		40	200
10335	1,3-Dichlorobenzene	541-73-1	N.D.		40	200
10335	1,4-Dichlorobenzene	106-46-7	N.D.		40	200
10335	Dichlorodifluoromethane	75-71-8	N.D.		60	200
10335	1,1-Dichloroethane	75-34-3	N.D.		40	200
10335	1,2-Dichloroethane	107-06-2	N.D.		400	200
10335	1,1-Dichloroethene	75-35-4	N.D.		40	200
10335	cis-1,2-Dichloroethene	156-59-2	N.D.		40	200
10335	trans-1,2-Dichloroethene	156-60-5	N.D.		40	200
10335	1,2-Dichloropropane	78-87-5	N.D.		40	200
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.		40	200
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.		40	200
10335	Ethylbenzene	100-41-4	N.D.		40	200
10335	Freon 113	76-13-1	N.D.		400	200
10335	2-Hexanone	591-78-6	N.D.		600	200
10335	Isopropylbenzene	98-82-8	N.D.		60	200
10335	Methyl Acetate	79-20-9	N.D.		120	200
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		40	200
10335	4-Methyl-2-pentanone	108-10-1	N.D.		100	200
10335	Methylcyclohexane	108-87-2	63	J	40	200
10335	Methylene Chloride	75-09-2	130	J B	40	200
10335	Styrene	100-42-5	N.D.		40	200
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.		40	200
10335	Tetrachloroethene	127-18-4	N.D.		40	200
10335	Toluene	108-88-3	44,000		40	200
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.		80	200
10335	1,1,1-Trichloroethane	71-55-6	N.D.		40	200
10335	1,1,2-Trichloroethane	79-00-5	N.D.		40	200
10335	Trichloroethene	79-01-6	N.D.		40	200
10335	Trichlorofluoromethane	75-69-4	N.D.		80	200
10335	Vinyl Chloride	75-01-4	N.D.		80	200
10335	Xylene (Total)	1330-20-7	N.D.		100	200

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Sample Description: **S-429_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 12:10

PES c/o Stantec
ELLE Sample #: WW 9995287
ELLE Group #: 2031386
Matrix: Groundwater

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190642AA	03/05/2019 23:28	Patrick T Herres	200
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190642AA	03/05/2019 23:50	Patrick T Herres	2000
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190642AA	03/05/2019 23:27	Patrick T Herres	200
01163	GC/MS VOA Water Prep	SW-846 5030B	2	Y190642AA	03/05/2019 23:49	Patrick T Herres	2000

Sample Description: **S-382_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 13:10

PES c/o Stantec
ELLE Sample #: WW 9995288
ELLE Group #: 2031386
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	
10335	Acetone	67-64-1	N.D.		160	200
10335	Benzene	71-43-2	580,000		400	2000
10335	Bromodichloromethane	75-27-4	N.D.		40	200
10335	Bromoform	75-25-2	N.D.		400	200
10335	Bromomethane	74-83-9	N.D.		100	200
10335	2-Butanone	78-93-3	N.D.		200	200
10335	Carbon Disulfide	75-15-0	N.D.		60	200
10335	Carbon Tetrachloride	56-23-5	N.D.		40	200
10335	Chlorobenzene	108-90-7	N.D.		40	200
10335	Chloroethane	75-00-3	N.D.		60	200
10335	Chloroform	67-66-3	N.D.		40	200
10335	Chloromethane	74-87-3	N.D.		60	200
10335	Cyclohexane	110-82-7	N.D.		400	200
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.		200	200
10335	Dibromochloromethane	124-48-1	N.D.		80	200
10335	1,2-Dibromoethane	106-93-4	N.D.		60	200
10335	1,2-Dichlorobenzene	95-50-1	N.D.		40	200
10335	1,3-Dichlorobenzene	541-73-1	N.D.		40	200
10335	1,4-Dichlorobenzene	106-46-7	N.D.		40	200
10335	Dichlorodifluoromethane	75-71-8	N.D.		60	200
10335	1,1-Dichloroethane	75-34-3	N.D.		40	200
10335	1,2-Dichloroethane	107-06-2	N.D.		400	200
10335	1,1-Dichloroethene	75-35-4	N.D.		40	200
10335	cis-1,2-Dichloroethene	156-59-2	N.D.		40	200
10335	trans-1,2-Dichloroethene	156-60-5	N.D.		40	200
10335	1,2-Dichloropropane	78-87-5	N.D.		40	200
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.		40	200
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.		40	200
10335	Ethylbenzene	100-41-4	N.D.		40	200
10335	Freon 113	76-13-1	N.D.		400	200
10335	2-Hexanone	591-78-6	N.D.		600	200
10335	Isopropylbenzene	98-82-8	N.D.		60	200
10335	Methyl Acetate	79-20-9	N.D.		120	200
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		40	200
10335	4-Methyl-2-pentanone	108-10-1	N.D.		100	200
10335	Methylcyclohexane	108-87-2	49	J	40	200
10335	Methylene Chloride	75-09-2	150	J B	40	200
10335	Styrene	100-42-5	N.D.		40	200
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.		40	200
10335	Tetrachloroethene	127-18-4	N.D.		40	200
10335	Toluene	108-88-3	69,000		400	2000
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.		80	200
10335	1,1,1-Trichloroethane	71-55-6	N.D.		40	200
10335	1,1,2-Trichloroethane	79-00-5	N.D.		40	200
10335	Trichloroethene	79-01-6	N.D.		40	200
10335	Trichlorofluoromethane	75-69-4	N.D.		80	200
10335	Vinyl Chloride	75-01-4	N.D.		80	200
10335	Xylene (Total)	1330-20-7	N.D.		100	200

Sample Description: **S-382_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 13:10

PES c/o Stantec
ELLE Sample #: WW 9995288
ELLE Group #: 2031386
Matrix: Groundwater

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190642AA	03/06/2019 00:12	Patrick T Herres	200
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190642AA	03/06/2019 00:34	Patrick T Herres	2000
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190642AA	03/06/2019 00:11	Patrick T Herres	200
01163	GC/MS VOA Water Prep	SW-846 5030B	2	Y190642AA	03/06/2019 00:33	Patrick T Herres	2000

Sample Description: **S-414_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 14:15

PES c/o Stantec
ELLE Sample #: WW 9995289
ELLE Group #: 2031386
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	Acetone	67-64-1	N.D.	160	200
10335	Benzene	71-43-2	460,000	400	2000
10335	Bromodichloromethane	75-27-4	N.D.	40	200
10335	Bromoform	75-25-2	N.D.	400	200
10335	Bromomethane	74-83-9	N.D.	100	200
10335	2-Butanone	78-93-3	N.D.	200	200
10335	Carbon Disulfide	75-15-0	N.D.	60	200
10335	Carbon Tetrachloride	56-23-5	N.D.	40	200
10335	Chlorobenzene	108-90-7	N.D.	40	200
10335	Chloroethane	75-00-3	N.D.	60	200
10335	Chloroform	67-66-3	N.D.	40	200
10335	Chloromethane	74-87-3	N.D.	60	200
10335	Cyclohexane	110-82-7	N.D.	400	200
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.	200	200
10335	Dibromochloromethane	124-48-1	N.D.	80	200
10335	1,2-Dibromoethane	106-93-4	N.D.	60	200
10335	1,2-Dichlorobenzene	95-50-1	N.D.	40	200
10335	1,3-Dichlorobenzene	541-73-1	N.D.	40	200
10335	1,4-Dichlorobenzene	106-46-7	N.D.	40	200
10335	Dichlorodifluoromethane	75-71-8	N.D.	60	200
10335	1,1-Dichloroethane	75-34-3	N.D.	40	200
10335	1,2-Dichloroethane	107-06-2	N.D.	400	200
10335	1,1-Dichloroethene	75-35-4	N.D.	40	200
10335	cis-1,2-Dichloroethene	156-59-2	N.D.	40	200
10335	trans-1,2-Dichloroethene	156-60-5	N.D.	40	200
10335	1,2-Dichloropropane	78-87-5	N.D.	40	200
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.	40	200
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.	40	200
10335	Ethylbenzene	100-41-4	N.D.	40	200
10335	Freon 113	76-13-1	N.D.	400	200
10335	2-Hexanone	591-78-6	N.D.	600	200
10335	Isopropylbenzene	98-82-8	N.D.	60	200
10335	Methyl Acetate	79-20-9	N.D.	120	200
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	40	200
10335	4-Methyl-2-pentanone	108-10-1	N.D.	100	200
10335	Methylcyclohexane	108-87-2	66 J	40	200
10335	Methylene Chloride	75-09-2	48 J B	40	200
10335	Styrene	100-42-5	N.D.	40	200
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	40	200
10335	Tetrachloroethene	127-18-4	N.D.	40	200
10335	Toluene	108-88-3	55,000	40	200
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.	80	200
10335	1,1,1-Trichloroethane	71-55-6	N.D.	40	200
10335	1,1,2-Trichloroethane	79-00-5	N.D.	40	200
10335	Trichloroethene	79-01-6	N.D.	40	200
10335	Trichlorofluoromethane	75-69-4	N.D.	80	200
10335	Vinyl Chloride	75-01-4	N.D.	80	200
10335	Xylene (Total)	1330-20-7	N.D.	100	200

Sample Description: **S-414_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 14:15

PES c/o Stantec
ELLE Sample #: WW 9995289
ELLE Group #: 2031386
Matrix: Groundwater

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190642AA	03/06/2019 00:56	Patrick T Herres	200
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190642AA	03/06/2019 01:18	Patrick T Herres	2000
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190642AA	03/06/2019 00:55	Patrick T Herres	200
01163	GC/MS VOA Water Prep	SW-846 5030B	2	Y190642AA	03/06/2019 01:17	Patrick T Herres	2000

Sample Description: **TRIP BLANK Water**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/21/2019

PES c/o Stantec
ELLE Sample #: WW 9995290
ELLE Group #: 2031386
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	Acetone	67-64-1	N.D.	0.8	1
10335	Benzene	71-43-2	N.D.	0.2	1
10335	Bromodichloromethane	75-27-4	N.D.	0.2	1
10335	Bromoform	75-25-2	N.D.	2	1
10335	Bromomethane	74-83-9	N.D.	0.5	1
10335	2-Butanone	78-93-3	N.D.	1	1
10335	Carbon Disulfide	75-15-0	N.D.	0.3	1
10335	Carbon Tetrachloride	56-23-5	N.D.	0.2	1
10335	Chlorobenzene	108-90-7	N.D.	0.2	1
10335	Chloroethane	75-00-3	N.D.	0.3	1
10335	Chloroform	67-66-3	N.D.	0.2	1
10335	Chloromethane	74-87-3	N.D.	0.3	1
10335	Cyclohexane	110-82-7	N.D.	2	1
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.	1	1
10335	Dibromochloromethane	124-48-1	N.D.	0.4	1
10335	1,2-Dibromoethane	106-93-4	N.D.	0.3	1
10335	1,2-Dichlorobenzene	95-50-1	N.D.	0.2	1
10335	1,3-Dichlorobenzene	541-73-1	N.D.	0.2	1
10335	1,4-Dichlorobenzene	106-46-7	N.D.	0.2	1
10335	Dichlorodifluoromethane	75-71-8	N.D.	0.3	1
10335	1,1-Dichloroethane	75-34-3	N.D.	0.2	1
10335	1,2-Dichloroethane	107-06-2	N.D.	2	1
10335	1,1-Dichloroethene	75-35-4	N.D.	0.2	1
10335	cis-1,2-Dichloroethene	156-59-2	N.D.	0.2	1
10335	trans-1,2-Dichloroethene	156-60-5	N.D.	0.2	1
10335	1,2-Dichloropropane	78-87-5	N.D.	0.2	1
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.	0.2	1
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.	0.2	1
10335	Ethylbenzene	100-41-4	N.D.	0.2	1
10335	Freon 113	76-13-1	N.D.	2	1
10335	2-Hexanone	591-78-6	N.D.	3	1
10335	Isopropylbenzene	98-82-8	N.D.	0.3	1
10335	Methyl Acetate	79-20-9	N.D.	0.6	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.2	1
10335	4-Methyl-2-pentanone	108-10-1	N.D.	0.5	1
10335	Methylcyclohexane	108-87-2	N.D.	0.2	1
10335	Methylene Chloride	75-09-2	0.2 J B	0.2	1
10335	Styrene	100-42-5	N.D.	0.2	1
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.2	1
10335	Tetrachloroethene	127-18-4	N.D.	0.2	1
10335	Toluene	108-88-3	N.D.	0.2	1
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.4	1
10335	1,1,1-Trichloroethane	71-55-6	N.D.	0.2	1
10335	1,1,2-Trichloroethane	79-00-5	N.D.	0.2	1
10335	Trichloroethene	79-01-6	N.D.	0.2	1
10335	Trichlorofluoromethane	75-69-4	N.D.	0.4	1
10335	Vinyl Chloride	75-01-4	N.D.	0.4	1
10335	Xylene (Total)	1330-20-7	N.D.	0.5	1

Sample Description: **TRIP BLANK Water**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/21/2019

PES c/o Stantec
ELLE Sample #: WW 9995290
ELLE Group #: 2031386
Matrix: Water

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190641AA	03/05/2019 10:21	Jennifer K Howe	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190641AA	03/05/2019 10:20	Jennifer K Howe	1

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Quality Control Summary

Client Name: PES c/o Stantec
Reported: 03/07/2019 21:45

Group Number: 2031386

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	MDL
	ug/l	ug/l
Batch number: Y190641AA	Sample number(s): 9995284,9995290	
Acetone	N.D.	0.8
Benzene	N.D.	0.2
Bromodichloromethane	N.D.	0.2
Bromoform	N.D.	2
Bromomethane	N.D.	0.5
2-Butanone	N.D.	1
Carbon Disulfide	N.D.	0.3
Carbon Tetrachloride	N.D.	0.2
Chlorobenzene	N.D.	0.2
Chloroethane	N.D.	0.3
Chloroform	N.D.	0.2
Chloromethane	N.D.	0.3
Cyclohexane	N.D.	2
1,2-Dibromo-3-chloropropane	N.D.	1
Dibromochloromethane	N.D.	0.4
1,2-Dibromoethane	N.D.	0.3
1,2-Dichlorobenzene	N.D.	0.2
1,3-Dichlorobenzene	N.D.	0.2
1,4-Dichlorobenzene	N.D.	0.2
Dichlorodifluoromethane	N.D.	0.3
1,1-Dichloroethane	N.D.	0.2
1,2-Dichloroethane	N.D.	2
1,1-Dichloroethene	N.D.	0.2
cis-1,2-Dichloroethene	N.D.	0.2
trans-1,2-Dichloroethene	N.D.	0.2
1,2-Dichloropropane	N.D.	0.2
cis-1,3-Dichloropropene	N.D.	0.2
trans-1,3-Dichloropropene	N.D.	0.2
Ethylbenzene	N.D.	0.2
Freon 113	N.D.	2
2-Hexanone	N.D.	3
Isopropylbenzene	N.D.	0.3
Methyl Acetate	N.D.	0.6
Methyl Tertiary Butyl Ether	N.D.	0.2
4-Methyl-2-pentanone	N.D.	0.5
Methylcyclohexane	N.D.	0.2
Methylene Chloride	0.2 J	0.2
Styrene	N.D.	0.2
1,1,2,2-Tetrachloroethane	N.D.	0.2

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: PES c/o Stantec
Reported: 03/07/2019 21:45

Group Number: 2031386

Method Blank (continued)

Analysis Name	Result	MDL
	ug/l	ug/l
Tetrachloroethene	N.D.	0.2
Toluene	N.D.	0.2
1,2,4-Trichlorobenzene	N.D.	0.4
1,1,1-Trichloroethane	N.D.	0.2
1,1,2-Trichloroethane	N.D.	0.2
Trichloroethene	N.D.	0.2
Trichlorofluoromethane	N.D.	0.4
Vinyl Chloride	N.D.	0.4
Xylene (Total)	N.D.	0.5
Batch number: Y190642AA	Sample number(s): 9995285-9995289	
Acetone	N.D.	0.8
Benzene	N.D.	0.2
Bromodichloromethane	N.D.	0.2
Bromoform	N.D.	2
Bromomethane	N.D.	0.5
2-Butanone	N.D.	1
Carbon Disulfide	N.D.	0.3
Carbon Tetrachloride	N.D.	0.2
Chlorobenzene	N.D.	0.2
Chloroethane	N.D.	0.3
Chloroform	N.D.	0.2
Chloromethane	N.D.	0.3
Cyclohexane	N.D.	2
1,2-Dibromo-3-chloropropane	N.D.	1
Dibromochloromethane	N.D.	0.4
1,2-Dibromoethane	N.D.	0.3
1,2-Dichlorobenzene	N.D.	0.2
1,3-Dichlorobenzene	N.D.	0.2
1,4-Dichlorobenzene	N.D.	0.2
Dichlorodifluoromethane	N.D.	0.3
1,1-Dichloroethane	N.D.	0.2
1,2-Dichloroethane	N.D.	2
1,1-Dichloroethene	N.D.	0.2
cis-1,2-Dichloroethene	N.D.	0.2
trans-1,2-Dichloroethene	N.D.	0.2
1,2-Dichloropropane	N.D.	0.2
cis-1,3-Dichloropropene	N.D.	0.2
trans-1,3-Dichloropropene	N.D.	0.2
Ethylbenzene	N.D.	0.2
Freon 113	N.D.	2
2-Hexanone	N.D.	3
Isopropylbenzene	N.D.	0.3
Methyl Acetate	N.D.	0.6
Methyl Tertiary Butyl Ether	N.D.	0.2

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: PES c/o Stantec
Reported: 03/07/2019 21:45

Group Number: 2031386

Method Blank (continued)

Analysis Name	Result ug/l	MDL ug/l
4-Methyl-2-pentanone	N.D.	0.5
Methylcyclohexane	N.D.	0.2
Methylene Chloride	0.2 J	0.2
Styrene	N.D.	0.2
1,1,2,2-Tetrachloroethane	N.D.	0.2
Tetrachloroethene	N.D.	0.2
Toluene	N.D.	0.2
1,2,4-Trichlorobenzene	N.D.	0.4
1,1,1-Trichloroethane	N.D.	0.2
1,1,2-Trichloroethane	N.D.	0.2
Trichloroethene	N.D.	0.2
Trichlorofluoromethane	N.D.	0.4
Vinyl Chloride	N.D.	0.4
Xylene (Total)	N.D.	0.5

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: Y190641AA	Sample number(s): 9995284,9995290								
Acetone	150	156.42	150	158.3	104	106	54-157	1	30
Benzene	20	21.8	20	21.59	109	108	80-120	1	30
Bromodichloromethane	20	20.43	20	20.49	102	102	71-120	0	30
Bromoform	20	18.53	20	18.17	93	91	51-120	2	30
Bromomethane	20	15.12	20	14.87	76	74	53-128	2	30
2-Butanone	150	142.08	150	143.8	95	96	59-135	1	30
Carbon Disulfide	20	21.04	20	20.66	105	103	65-128	2	30
Carbon Tetrachloride	20	20.99	20	20.68	105	103	64-134	1	30
Chlorobenzene	20	21.45	20	21.33	107	107	80-120	1	30
Chloroethane	20	16.35	20	16.36	82	82	55-123	0	30
Chloroform	20	21.39	20	21.03	107	105	80-120	2	30
Chloromethane	20	17.43	20	17.14	87	86	56-121	2	30
Cyclohexane	20	19.72	20	19.6	99	98	68-126	1	30
1,2-Dibromo-3-chloropropane	20	19.67	20	19.82	98	99	47-131	1	30
Dibromochloromethane	20	20.13	20	19.82	101	99	71-120	2	30
1,2-Dibromoethane	20	21.04	20	20.97	105	105	77-120	0	30
1,2-Dichlorobenzene	20	21.74	20	21.56	109	108	80-120	1	30
1,3-Dichlorobenzene	20	21.61	20	21.4	108	107	80-120	1	30
1,4-Dichlorobenzene	20	21.92	20	21.59	110	108	80-120	2	30
Dichlorodifluoromethane	20	14	20	13.88	70	69	41-127	1	30
1,1-Dichloroethane	20	21.15	20	20.98	106	105	80-120	1	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: PES c/o Stantec
Reported: 03/07/2019 21:45

Group Number: 2031386

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
1,2-Dichloroethane	20	20.02	20	20.11	100	101	73-124	0	30
1,1-Dichloroethene	20	23.56	20	23.38	118	117	80-131	1	30
cis-1,2-Dichloroethene	20	22.39	20	21.98	112	110	80-120	2	30
trans-1,2-Dichloroethene	20	22.54	20	22.29	113	111	80-120	1	30
1,2-Dichloropropane	20	21.8	20	22.01	109	110	80-120	1	30
cis-1,3-Dichloropropene	20	20.34	20	20.37	102	102	75-120	0	30
trans-1,3-Dichloropropene	20	19.54	20	19.43	98	97	67-120	1	30
Ethylbenzene	20	21.11	20	20.81	106	104	80-120	1	30
Freon 113	20	22.47	20	22.3	112	111	73-139	1	30
2-Hexanone	100	96.08	100	95.41	96	95	56-135	1	30
Isopropylbenzene	20	20.89	20	20.62	104	103	80-120	1	30
Methyl Acetate	20	19.69	20	19.7	98	98	54-136	0	30
Methyl Tertiary Butyl Ether	20	19.55	20	19.62	98	98	69-122	0	30
4-Methyl-2-pentanone	100	93.6	100	93.22	94	93	62-133	0	30
Methylcyclohexane	20	18.45	20	18.43	92	92	67-121	0	30
Methylene Chloride	20	22.58	20	22.03	113	110	80-120	2	30
Styrene	20	21.08	20	20.76	105	104	80-120	2	30
1,1,2,2-Tetrachloroethane	20	21.56	20	21.62	108	108	72-120	0	30
Tetrachloroethene	20	21.08	20	21.05	105	105	80-120	0	30
Toluene	20	21.39	20	21.04	107	105	80-120	2	30
1,2,4-Trichlorobenzene	20	20.44	20	20.37	102	102	63-120	0	30
1,1,1-Trichloroethane	20	20.63	20	20.84	103	104	67-126	1	30
1,1,2-Trichloroethane	20	22.12	20	22.14	111	111	80-120	0	30
Trichloroethene	20	21.51	20	21.52	108	108	80-120	0	30
Trichlorofluoromethane	20	17.72	20	17.07	89	85	55-135	4	30
Vinyl Chloride	20	17.33	20	17.04	87	85	56-120	2	30
Xylene (Total)	60	63.54	60	62.69	106	104	80-120	1	30
Batch number: Y190642AA	Sample number(s): 9995285-9995289								
Acetone	150	154.86	150	159.67	103	106	54-157	3	30
Benzene	20	21.66	20	22.24	108	111	80-120	3	30
Bromodichloromethane	20	20.12	20	20.96	101	105	71-120	4	30
Bromoform	20	17.71	20	18.13	89	91	51-120	2	30
Bromomethane	20	15.23	20	15.89	76	79	53-128	4	30
2-Butanone	150	140.03	150	145.22	93	97	59-135	4	30
Carbon Disulfide	20	21	20	21.64	105	108	65-128	3	30
Carbon Tetrachloride	20	21.08	20	21.53	105	108	64-134	2	30
Chlorobenzene	20	21.38	20	22.08	107	110	80-120	3	30
Chloroethane	20	15.94	20	16.56	80	83	55-123	4	30
Chloroform	20	21.21	20	21.87	106	109	80-120	3	30
Chloromethane	20	17.28	20	17.89	86	89	56-121	4	30
Cyclohexane	20	19.75	20	20.42	99	102	68-126	3	30
1,2-Dibromo-3-chloropropane	20	19.19	20	19.74	96	99	47-131	3	30
Dibromochloromethane	20	19.75	20	20.45	99	102	71-120	4	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: PES c/o Stantec
Reported: 03/07/2019 21:45

Group Number: 2031386

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
1,2-Dibromoethane	20	20.91	20	21.82	105	109	77-120	4	30
1,2-Dichlorobenzene	20	21.51	20	21.95	108	110	80-120	2	30
1,3-Dichlorobenzene	20	21.25	20	21.86	106	109	80-120	3	30
1,4-Dichlorobenzene	20	21.4	20	22.03	107	110	80-120	3	30
Dichlorodifluoromethane	20	14.65	20	15.19	73	76	41-127	4	30
1,1-Dichloroethane	20	20.83	20	21.44	104	107	80-120	3	30
1,2-Dichloroethane	20	20.19	20	20.63	101	103	73-124	2	30
1,1-Dichloroethene	20	23.31	20	24.29	117	121	80-131	4	30
cis-1,2-Dichloroethene	20	22.3	20	22.74	111	114	80-120	2	30
trans-1,2-Dichloroethene	20	22.57	20	23.3	113	116	80-120	3	30
1,2-Dichloropropane	20	21.72	20	22.63	109	113	80-120	4	30
cis-1,3-Dichloropropene	20	19.79	20	20.55	99	103	75-120	4	30
trans-1,3-Dichloropropene	20	19.22	20	19.88	96	99	67-120	3	30
Ethylbenzene	20	20.84	20	21.45	104	107	80-120	3	30
Freon 113	20	23.08	20	23.6	115	118	73-139	2	30
2-Hexanone	100	94.68	100	98.29	95	98	56-135	4	30
Isopropylbenzene	20	20.53	20	21.1	103	105	80-120	3	30
Methyl Acetate	20	19.36	20	20.4	97	102	54-136	5	30
Methyl Tertiary Butyl Ether	20	19.4	20	20.01	97	100	69-122	3	30
4-Methyl-2-pentanone	100	92.47	100	96.15	92	96	62-133	4	30
Methylcyclohexane	20	18.74	20	19.35	94	97	67-121	3	30
Methylene Chloride	20	22.38	20	23.1	112	115	80-120	3	30
Styrene	20	20.74	20	21.44	104	107	80-120	3	30
1,1,2,2-Tetrachloroethane	20	21.26	20	21.81	106	109	72-120	3	30
Tetrachloroethene	20	20.89	20	21.51	104	108	80-120	3	30
Toluene	20	21.12	20	21.73	106	109	80-120	3	30
1,2,4-Trichlorobenzene	20	20.07	20	20.5	100	102	63-120	2	30
1,1,1-Trichloroethane	20	20.56	20	21.28	103	106	67-126	3	30
1,1,2-Trichloroethane	20	22.35	20	23.12	112	116	80-120	3	30
Trichloroethene	20	21.59	20	22.1	108	111	80-120	2	30
Trichlorofluoromethane	20	17.68	20	17.94	88	90	55-135	2	30
Vinyl Chloride	20	17.56	20	18.08	88	90	56-120	3	30
Xylene (Total)	60	62.83	60	64.6	105	108	80-120	3	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: PES c/o Stantec
Reported: 03/07/2019 21:45

Group Number: 2031386

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: TCL (4.3) 8260 Water
Batch number: Y190641AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
9995284	103	108	103	100
9995290	108	114	102	97
Blank	106	112	104	100
LCS	105	110	106	106
LCSD	104	109	106	105
Limits:	80-120	80-120	80-120	80-120

Analysis Name: TCL (4.3) 8260 Water
Batch number: Y190642AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
9995285	104	108	103	97
9995286	102	102	103	96
9995287	103	103	102	96
9995288	102	102	103	95
9995289	103	104	104	97
Blank	108	113	103	97
LCS	105	107	106	106
LCSD	105	109	106	104
Limits:	80-120	80-120	80-120	80-120

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Environmental Analysis Request/Chain of Custody

eurofins | Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 42093 Group # 203138G Sample # 9995284-90

COC # 565906

Client Information

Client: Stantec | Acct. #: PES

Project Name/#: 213403039 PES Reformate EWS | PWSID #:

Project Manager: Andrew Klingbeil | P.O. #: 213403039

Sampler: Dane Hopkins | Quote #:

State where samples were collected: PA | For Compliance: Yes ☐ No ☐

Matrix

Soil ☐ Sediment ☐ Tissue ☐ | Water ☒ Potable ☐ Ground ☐ NPDES ☐ Surface ☐ | Other: Trip blank

Analysis Requested

Preservation and Filtration Codes

For Lab Use Only: FSC: | SCR#: 239153

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 P=H_3PO_4
F=Field Filtered O=Other

Remarks

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	4	VOCs 8260
S-283-20190226	2/26/19	0905	X		3		X
S-430_20190226		1015	X		3		X
S-431_20190226		1100	X		3		X
S-429-20190226		1210	X		3		X
S-382_20190226		1310	X		3		X
S-414_20190226		1415	X		3		X
TRIP BLANK	2/21/19	—	X		2		X

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: _____

E-mail address: andrew.klingbeil@stantec.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) | Type VI (Raw Data Only)

Type III (Reduced non-CLP) | NJ DKQP | TX TRRP-13

NYSDEC Category A or B | MA MCP | CT RCP

Relinquished by	Date	Time	Received by	Date	Time
Dane	2.25.19	11:21		2.25.19	11:21
	2.25.19	1250			
				2/28/19	12:50

EDD Required? Yes No

If yes, format: EQuIS

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS _____ FedEx _____ Other _____

Temperature upon receipt 1.1 °C

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Sample Administration Receipt Documentation Log

Doc Log ID: 242347

Group Number(s): 2031386

Client: Stantec

Delivery and Receipt Information

Delivery Method:	ELLE Courier	Arrival Timestamp:	02/28/2019 12:50
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	Pennsylvania		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	Yes	VOA Vial Headspace ≥ 6mm:	No
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	6
Samples Intact:	Yes	Trip Blank Type:	HCL
Missing Samples:	No	Air Quality Samples Present:	No
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Juan Carrion (16518) at 15:58 on 02/28/2019

Samples Chilled Details

Thermometer Types: *DT = Digital (Temp. Bottle)* *IR = Infrared (Surface Temp)* *All Temperatures in °C.*

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT42-03	1.1	DT	Wet	Y	Bagged	N

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Lancaster, PA 17605-2425
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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mL**	milliliter(s)
C	degrees Celsius	**MPN**	Most Probable Number
cfu	colony forming units	**N.D.**	non-detect
CP Units	cobalt-chloroplatinate units	**ng**	nanogram(s)
F	degrees Fahrenheit	**NTU**	nephelometric turbidity units
g	gram(s)	**pg/L**	picogram/liter
IU	International Units	**RL**	Reporting Limit
kg	kilogram(s)	**TNTC**	Too Numerous To Count
L	liter(s)	**µg**	microgram(s)
lb.	pound(s)	**µL**	microliter(s)
m3	cubic meter(s)	**umhos/cm**	micromhos/cm
meq	milliequivalents	**MCL**	Maximum Contamination Limit
mg	milligram(s)		

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

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Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value >= the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column >40%. The lower result is reported.
P^	Concentration difference between the primary and confirmation column > 40%. The higher result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report
B	Detection in the Blank
Q0	LCS/LCSD Low
Q1	LCS/LCSD High
Q2	MS/MSD Low
Q3	MS/MSD High
Q7	LCS/LCSD RPD
Q8	DUP RPD
Q9	MS/MSD RPD

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

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ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

PES c/o Stantec
1060 Andrew Drive
Suite 140
West Chester PA 19380

Report Date: March 07, 2019 13:40

Project: PES Reformate GWs

Account #: 42093
Group Number: 2031387
PO Number: PES REFORMATE
State of Sample Origin: PA

Electronic Copy To	PES c/o Stantec	Attn: Andrew Bradley
Electronic Copy To	PES c/o Stantec	Attn: Andrew Klingbeil

Respectfully Submitted,

Amek Carter
Specialist

(717) 556-7252

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SAMPLE INFORMATION

Client Sample Description	Sample Collection Date/Time	ELLE#
C-129D_20190226 Grab Groundwater	02/26/2019 09:11	9995291
S-280D_20190226 Grab Groundwater	02/26/2019 10:15	9995292
S-284D_20190226 Grab Groundwater	02/26/2019 10:59	9995293
S-69D_20190226 Grab Groundwater	02/26/2019 11:55	9995294
C-174_20190226 Grab Groundwater	02/26/2019 12:32	9995295
BF-103R_20190226 Grab Groundwater	02/26/2019 13:30	9995296
S-413_20190226 Grab Groundwater	02/26/2019 14:10	9995297
EB_20190226-01 Grab Water	02/26/2019 14:20	9995298
EB_20190226-02 Grab Water	02/26/2019 14:25	9995299
TRIP BLANK-2 Water	02/21/2019	9995300

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Sample Description: **C-129D_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 09:11

PES c/o Stantec
ELLE Sample #: WW 9995291
ELLE Group #: 2031387
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	
10335	Acetone	67-64-1	11	J	0.8	1
10335	Benzene	71-43-2	0.2	J	0.2	1
10335	Bromodichloromethane	75-27-4	N.D.		0.2	1
10335	Bromoform	75-25-2	N.D.		2	1
10335	Bromomethane	74-83-9	N.D.		0.5	1
10335	2-Butanone	78-93-3	N.D.		1	1
10335	Carbon Disulfide	75-15-0	N.D.		0.3	1
10335	Carbon Tetrachloride	56-23-5	N.D.		0.2	1
10335	Chlorobenzene	108-90-7	N.D.		0.2	1
10335	Chloroethane	75-00-3	N.D.		0.3	1
10335	Chloroform	67-66-3	N.D.		0.2	1
10335	Chloromethane	74-87-3	N.D.		0.3	1
10335	Cyclohexane	110-82-7	N.D.		2	1
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.		1	1
10335	Dibromochloromethane	124-48-1	N.D.		0.4	1
10335	1,2-Dibromoethane	106-93-4	N.D.		0.3	1
10335	1,2-Dichlorobenzene	95-50-1	N.D.		0.2	1
10335	1,3-Dichlorobenzene	541-73-1	N.D.		0.2	1
10335	1,4-Dichlorobenzene	106-46-7	N.D.		0.2	1
10335	Dichlorodifluoromethane	75-71-8	N.D.		0.3	1
10335	1,1-Dichloroethane	75-34-3	N.D.		0.2	1
10335	1,2-Dichloroethane	107-06-2	N.D.		2	1
10335	1,1-Dichloroethene	75-35-4	N.D.		0.2	1
10335	cis-1,2-Dichloroethene	156-59-2	N.D.		0.2	1
10335	trans-1,2-Dichloroethene	156-60-5	N.D.		0.2	1
10335	1,2-Dichloropropane	78-87-5	N.D.		0.2	1
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.		0.2	1
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.		0.2	1
10335	Ethylbenzene	100-41-4	N.D.		0.2	1
10335	Freon 113	76-13-1	N.D.		2	1
10335	2-Hexanone	591-78-6	N.D.		3	1
10335	Isopropylbenzene	98-82-8	N.D.		0.3	1
10335	Methyl Acetate	79-20-9	N.D.		0.6	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	0.3	J	0.2	1
10335	4-Methyl-2-pentanone	108-10-1	N.D.		0.5	1
10335	Methylcyclohexane	108-87-2	N.D.		0.2	1
10335	Methylene Chloride	75-09-2	0.3	J B	0.2	1
10335	Styrene	100-42-5	N.D.		0.2	1
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.		0.2	1
10335	Tetrachloroethene	127-18-4	N.D.		0.2	1
10335	Toluene	108-88-3	N.D.		0.2	1
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.		0.4	1
10335	1,1,1-Trichloroethane	71-55-6	N.D.		0.2	1
10335	1,1,2-Trichloroethane	79-00-5	N.D.		0.2	1
10335	Trichloroethene	79-01-6	N.D.		0.2	1
10335	Trichlorofluoromethane	75-69-4	N.D.		0.4	1
10335	Vinyl Chloride	75-01-4	N.D.		0.4	1
10335	Xylene (Total)	1330-20-7	N.D.		0.5	1

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Sample Description: **C-129D_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 09:11

PES c/o Stantec
ELLE Sample #: WW 9995291
ELLE Group #: 2031387
Matrix: Groundwater

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190641AA	03/05/2019 16:58	Jennifer K Howe	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190641AA	03/05/2019 16:57	Jennifer K Howe	1

Sample Description: **S-280D_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 10:15

PES c/o Stantec
ELLE Sample #: WW 9995292
ELLE Group #: 2031387
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	Acetone	67-64-1	N.D.	0.8	1
10335	Benzene	71-43-2	N.D.	0.2	1
10335	Bromodichloromethane	75-27-4	N.D.	0.2	1
10335	Bromoform	75-25-2	N.D.	2	1
10335	Bromomethane	74-83-9	N.D.	0.5	1
10335	2-Butanone	78-93-3	N.D.	1	1
10335	Carbon Disulfide	75-15-0	N.D.	0.3	1
10335	Carbon Tetrachloride	56-23-5	N.D.	0.2	1
10335	Chlorobenzene	108-90-7	N.D.	0.2	1
10335	Chloroethane	75-00-3	N.D.	0.3	1
10335	Chloroform	67-66-3	N.D.	0.2	1
10335	Chloromethane	74-87-3	N.D.	0.3	1
10335	Cyclohexane	110-82-7	N.D.	2	1
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.	1	1
10335	Dibromochloromethane	124-48-1	N.D.	0.4	1
10335	1,2-Dibromoethane	106-93-4	N.D.	0.3	1
10335	1,2-Dichlorobenzene	95-50-1	N.D.	0.2	1
10335	1,3-Dichlorobenzene	541-73-1	N.D.	0.2	1
10335	1,4-Dichlorobenzene	106-46-7	N.D.	0.2	1
10335	Dichlorodifluoromethane	75-71-8	N.D.	0.3	1
10335	1,1-Dichloroethane	75-34-3	0.6 J	0.2	1
10335	1,2-Dichloroethane	107-06-2	N.D.	2	1
10335	1,1-Dichloroethene	75-35-4	N.D.	0.2	1
10335	cis-1,2-Dichloroethene	156-59-2	N.D.	0.2	1
10335	trans-1,2-Dichloroethene	156-60-5	N.D.	0.2	1
10335	1,2-Dichloropropane	78-87-5	N.D.	0.2	1
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.	0.2	1
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.	0.2	1
10335	Ethylbenzene	100-41-4	N.D.	0.2	1
10335	Freon 113	76-13-1	N.D.	2	1
10335	2-Hexanone	591-78-6	N.D.	3	1
10335	Isopropylbenzene	98-82-8	N.D.	0.3	1
10335	Methyl Acetate	79-20-9	N.D.	0.6	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	0.4 J	0.2	1
10335	4-Methyl-2-pentanone	108-10-1	N.D.	0.5	1
10335	Methylcyclohexane	108-87-2	N.D.	0.2	1
10335	Methylene Chloride	75-09-2	0.2 J B	0.2	1
10335	Styrene	100-42-5	N.D.	0.2	1
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.2	1
10335	Tetrachloroethene	127-18-4	N.D.	0.2	1
10335	Toluene	108-88-3	N.D.	0.2	1
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.4	1
10335	1,1,1-Trichloroethane	71-55-6	N.D.	0.2	1
10335	1,1,2-Trichloroethane	79-00-5	N.D.	0.2	1
10335	Trichloroethene	79-01-6	N.D.	0.2	1
10335	Trichlorofluoromethane	75-69-4	N.D.	0.4	1
10335	Vinyl Chloride	75-01-4	N.D.	0.4	1
10335	Xylene (Total)	1330-20-7	N.D.	0.5	1

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Sample Description: **S-280D_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 10:15

PES c/o Stantec
ELLE Sample #: WW 9995292
ELLE Group #: 2031387
Matrix: Groundwater

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190641AA	03/05/2019 14:01	Jennifer K Howe	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190641AA	03/05/2019 14:00	Jennifer K Howe	1

Sample Description: **S-284D_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 10:59

PES c/o Stantec
ELLE Sample #: WW 9995293
ELLE Group #: 2031387
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	Acetone	67-64-1	2 J	0.8	1
10335	Benzene	71-43-2	0.3 J	0.2	1
10335	Bromodichloromethane	75-27-4	N.D.	0.2	1
10335	Bromoform	75-25-2	N.D.	2	1
10335	Bromomethane	74-83-9	N.D.	0.5	1
10335	2-Butanone	78-93-3	N.D.	1	1
10335	Carbon Disulfide	75-15-0	N.D.	0.3	1
10335	Carbon Tetrachloride	56-23-5	N.D.	0.2	1
10335	Chlorobenzene	108-90-7	N.D.	0.2	1
10335	Chloroethane	75-00-3	N.D.	0.3	1
10335	Chloroform	67-66-3	N.D.	0.2	1
10335	Chloromethane	74-87-3	N.D.	0.3	1
10335	Cyclohexane	110-82-7	4 J	2	1
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.	1	1
10335	Dibromochloromethane	124-48-1	N.D.	0.4	1
10335	1,2-Dibromoethane	106-93-4	N.D.	0.3	1
10335	1,2-Dichlorobenzene	95-50-1	N.D.	0.2	1
10335	1,3-Dichlorobenzene	541-73-1	N.D.	0.2	1
10335	1,4-Dichlorobenzene	106-46-7	N.D.	0.2	1
10335	Dichlorodifluoromethane	75-71-8	N.D.	0.3	1
10335	1,1-Dichloroethane	75-34-3	N.D.	0.2	1
10335	1,2-Dichloroethane	107-06-2	N.D.	2	1
10335	1,1-Dichloroethene	75-35-4	N.D.	0.2	1
10335	cis-1,2-Dichloroethene	156-59-2	N.D.	0.2	1
10335	trans-1,2-Dichloroethene	156-60-5	N.D.	0.2	1
10335	1,2-Dichloropropane	78-87-5	N.D.	0.2	1
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.	0.2	1
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.	0.2	1
10335	Ethylbenzene	100-41-4	N.D.	0.2	1
10335	Freon 113	76-13-1	N.D.	2	1
10335	2-Hexanone	591-78-6	N.D.	3	1
10335	Isopropylbenzene	98-82-8	N.D.	0.3	1
10335	Methyl Acetate	79-20-9	N.D.	0.6	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.2	1
10335	4-Methyl-2-pentanone	108-10-1	N.D.	0.5	1
10335	Methylcyclohexane	108-87-2	74	0.2	1
10335	Methylene Chloride	75-09-2	0.6 J B	0.2	1
10335	Styrene	100-42-5	N.D.	0.2	1
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.2	1
10335	Tetrachloroethene	127-18-4	N.D.	0.2	1
10335	Toluene	108-88-3	N.D.	0.2	1
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.4	1
10335	1,1,1-Trichloroethane	71-55-6	N.D.	0.2	1
10335	1,1,2-Trichloroethane	79-00-5	N.D.	0.2	1
10335	Trichloroethene	79-01-6	N.D.	0.2	1
10335	Trichlorofluoromethane	75-69-4	N.D.	0.4	1
10335	Vinyl Chloride	75-01-4	N.D.	0.4	1
10335	Xylene (Total)	1330-20-7	N.D.	0.5	1

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Sample Description: **S-284D_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 10:59

PES c/o Stantec
ELLE Sample #: WW 9995293
ELLE Group #: 2031387
Matrix: Groundwater

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190641AA	03/05/2019 14:23	Jennifer K Howe	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190641AA	03/05/2019 14:22	Jennifer K Howe	1

Sample Description: **S-69D_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 11:55

PES c/o Stantec
ELLE Sample #: WW 9995294
ELLE Group #: 2031387
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	Acetone	67-64-1	1 J	0.8	1
10335	Benzene	71-43-2	N.D.	0.2	1
10335	Bromodichloromethane	75-27-4	N.D.	0.2	1
10335	Bromoform	75-25-2	N.D.	2	1
10335	Bromomethane	74-83-9	N.D.	0.5	1
10335	2-Butanone	78-93-3	N.D.	1	1
10335	Carbon Disulfide	75-15-0	N.D.	0.3	1
10335	Carbon Tetrachloride	56-23-5	N.D.	0.2	1
10335	Chlorobenzene	108-90-7	N.D.	0.2	1
10335	Chloroethane	75-00-3	N.D.	0.3	1
10335	Chloroform	67-66-3	N.D.	0.2	1
10335	Chloromethane	74-87-3	N.D.	0.3	1
10335	Cyclohexane	110-82-7	N.D.	2	1
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.	1	1
10335	Dibromochloromethane	124-48-1	N.D.	0.4	1
10335	1,2-Dibromoethane	106-93-4	N.D.	0.3	1
10335	1,2-Dichlorobenzene	95-50-1	N.D.	0.2	1
10335	1,3-Dichlorobenzene	541-73-1	N.D.	0.2	1
10335	1,4-Dichlorobenzene	106-46-7	N.D.	0.2	1
10335	Dichlorodifluoromethane	75-71-8	N.D.	0.3	1
10335	1,1-Dichloroethane	75-34-3	N.D.	0.2	1
10335	1,2-Dichloroethane	107-06-2	N.D.	2	1
10335	1,1-Dichloroethene	75-35-4	N.D.	0.2	1
10335	cis-1,2-Dichloroethene	156-59-2	N.D.	0.2	1
10335	trans-1,2-Dichloroethene	156-60-5	N.D.	0.2	1
10335	1,2-Dichloropropane	78-87-5	N.D.	0.2	1
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.	0.2	1
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.	0.2	1
10335	Ethylbenzene	100-41-4	N.D.	0.2	1
10335	Freon 113	76-13-1	N.D.	2	1
10335	2-Hexanone	591-78-6	N.D.	3	1
10335	Isopropylbenzene	98-82-8	N.D.	0.3	1
10335	Methyl Acetate	79-20-9	N.D.	0.6	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	2	0.2	1
10335	4-Methyl-2-pentanone	108-10-1	N.D.	0.5	1
10335	Methylcyclohexane	108-87-2	N.D.	0.2	1
10335	Methylene Chloride	75-09-2	0.3 J B	0.2	1
10335	Styrene	100-42-5	N.D.	0.2	1
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.2	1
10335	Tetrachloroethene	127-18-4	N.D.	0.2	1
10335	Toluene	108-88-3	N.D.	0.2	1
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.4	1
10335	1,1,1-Trichloroethane	71-55-6	N.D.	0.2	1
10335	1,1,2-Trichloroethane	79-00-5	N.D.	0.2	1
10335	Trichloroethene	79-01-6	N.D.	0.2	1
10335	Trichlorofluoromethane	75-69-4	N.D.	0.4	1
10335	Vinyl Chloride	75-01-4	N.D.	0.4	1
10335	Xylene (Total)	1330-20-7	N.D.	0.5	1

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Sample Description: **S-69D_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 11:55

PES c/o Stantec
ELLE Sample #: WW 9995294
ELLE Group #: 2031387
Matrix: Groundwater

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190641AA	03/05/2019 14:45	Jennifer K Howe	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190641AA	03/05/2019 14:44	Jennifer K Howe	1

Sample Description: **C-174_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 12:32

PES c/o Stantec
ELLE Sample #: WW 9995295
ELLE Group #: 2031387
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	Acetone	67-64-1	2 J	0.8	1
10335	Benzene	71-43-2	N.D.	0.2	1
10335	Bromodichloromethane	75-27-4	N.D.	0.2	1
10335	Bromoform	75-25-2	N.D.	2	1
10335	Bromomethane	74-83-9	N.D.	0.5	1
10335	2-Butanone	78-93-3	N.D.	1	1
10335	Carbon Disulfide	75-15-0	N.D.	0.3	1
10335	Carbon Tetrachloride	56-23-5	N.D.	0.2	1
10335	Chlorobenzene	108-90-7	N.D.	0.2	1
10335	Chloroethane	75-00-3	N.D.	0.3	1
10335	Chloroform	67-66-3	N.D.	0.2	1
10335	Chloromethane	74-87-3	N.D.	0.3	1
10335	Cyclohexane	110-82-7	N.D.	2	1
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.	1	1
10335	Dibromochloromethane	124-48-1	N.D.	0.4	1
10335	1,2-Dibromoethane	106-93-4	N.D.	0.3	1
10335	1,2-Dichlorobenzene	95-50-1	N.D.	0.2	1
10335	1,3-Dichlorobenzene	541-73-1	N.D.	0.2	1
10335	1,4-Dichlorobenzene	106-46-7	N.D.	0.2	1
10335	Dichlorodifluoromethane	75-71-8	N.D.	0.3	1
10335	1,1-Dichloroethane	75-34-3	N.D.	0.2	1
10335	1,2-Dichloroethane	107-06-2	N.D.	2	1
10335	1,1-Dichloroethene	75-35-4	N.D.	0.2	1
10335	cis-1,2-Dichloroethene	156-59-2	N.D.	0.2	1
10335	trans-1,2-Dichloroethene	156-60-5	N.D.	0.2	1
10335	1,2-Dichloropropane	78-87-5	N.D.	0.2	1
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.	0.2	1
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.	0.2	1
10335	Ethylbenzene	100-41-4	N.D.	0.2	1
10335	Freon 113	76-13-1	N.D.	2	1
10335	2-Hexanone	591-78-6	N.D.	3	1
10335	Isopropylbenzene	98-82-8	N.D.	0.3	1
10335	Methyl Acetate	79-20-9	N.D.	0.6	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.2	1
10335	4-Methyl-2-pentanone	108-10-1	N.D.	0.5	1
10335	Methylcyclohexane	108-87-2	N.D.	0.2	1
10335	Methylene Chloride	75-09-2	0.5 J B	0.2	1
10335	Styrene	100-42-5	N.D.	0.2	1
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.2	1
10335	Tetrachloroethene	127-18-4	N.D.	0.2	1
10335	Toluene	108-88-3	N.D.	0.2	1
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.4	1
10335	1,1,1-Trichloroethane	71-55-6	N.D.	0.2	1
10335	1,1,2-Trichloroethane	79-00-5	N.D.	0.2	1
10335	Trichloroethene	79-01-6	N.D.	0.2	1
10335	Trichlorofluoromethane	75-69-4	N.D.	0.4	1
10335	Vinyl Chloride	75-01-4	N.D.	0.4	1
10335	Xylene (Total)	1330-20-7	N.D.	0.5	1

Sample Description: **C-174_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 12:32

PES c/o Stantec
ELLE Sample #: WW 9995295
ELLE Group #: 2031387
Matrix: Groundwater

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190641AA	03/05/2019 15:08	Jennifer K Howe	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190641AA	03/05/2019 15:07	Jennifer K Howe	1

Sample Description: **BF-103R_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 13:30

PES c/o Stantec
ELLE Sample #: WW 9995296
ELLE Group #: 2031387
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	Acetone	67-64-1	23	0.8	1
10335	Benzene	71-43-2	N.D.	0.2	1
10335	Bromodichloromethane	75-27-4	N.D.	0.2	1
10335	Bromoform	75-25-2	N.D.	2	1
10335	Bromomethane	74-83-9	N.D.	0.5	1
10335	2-Butanone	78-93-3	N.D.	1	1
10335	Carbon Disulfide	75-15-0	N.D.	0.3	1
10335	Carbon Tetrachloride	56-23-5	N.D.	0.2	1
10335	Chlorobenzene	108-90-7	N.D.	0.2	1
10335	Chloroethane	75-00-3	N.D.	0.3	1
10335	Chloroform	67-66-3	N.D.	0.2	1
10335	Chloromethane	74-87-3	N.D.	0.3	1
10335	Cyclohexane	110-82-7	N.D.	2	1
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.	1	1
10335	Dibromochloromethane	124-48-1	N.D.	0.4	1
10335	1,2-Dibromoethane	106-93-4	N.D.	0.3	1
10335	1,2-Dichlorobenzene	95-50-1	N.D.	0.2	1
10335	1,3-Dichlorobenzene	541-73-1	N.D.	0.2	1
10335	1,4-Dichlorobenzene	106-46-7	N.D.	0.2	1
10335	Dichlorodifluoromethane	75-71-8	N.D.	0.3	1
10335	1,1-Dichloroethane	75-34-3	N.D.	0.2	1
10335	1,2-Dichloroethane	107-06-2	N.D.	2	1
10335	1,1-Dichloroethene	75-35-4	N.D.	0.2	1
10335	cis-1,2-Dichloroethene	156-59-2	N.D.	0.2	1
10335	trans-1,2-Dichloroethene	156-60-5	N.D.	0.2	1
10335	1,2-Dichloropropane	78-87-5	N.D.	0.2	1
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.	0.2	1
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.	0.2	1
10335	Ethylbenzene	100-41-4	N.D.	0.2	1
10335	Freon 113	76-13-1	N.D.	2	1
10335	2-Hexanone	591-78-6	N.D.	3	1
10335	Isopropylbenzene	98-82-8	N.D.	0.3	1
10335	Methyl Acetate	79-20-9	N.D.	0.6	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.2	1
10335	4-Methyl-2-pentanone	108-10-1	N.D.	0.5	1
10335	Methylcyclohexane	108-87-2	N.D.	0.2	1
10335	Methylene Chloride	75-09-2	1 B	0.2	1
10335	Styrene	100-42-5	N.D.	0.2	1
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.2	1
10335	Tetrachloroethene	127-18-4	N.D.	0.2	1
10335	Toluene	108-88-3	N.D.	0.2	1
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.4	1
10335	1,1,1-Trichloroethane	71-55-6	N.D.	0.2	1
10335	1,1,2-Trichloroethane	79-00-5	N.D.	0.2	1
10335	Trichloroethene	79-01-6	N.D.	0.2	1
10335	Trichlorofluoromethane	75-69-4	N.D.	0.4	1
10335	Vinyl Chloride	75-01-4	N.D.	0.4	1
10335	Xylene (Total)	1330-20-7	N.D.	0.5	1

Sample Description: **BF-103R_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 13:30

PES c/o Stantec
ELLE Sample #: WW 9995296
ELLE Group #: 2031387
Matrix: Groundwater

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190641AA	03/05/2019 15:30	Jennifer K Howe	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190641AA	03/05/2019 15:29	Jennifer K Howe	1

Sample Description: **S-413_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 14:10

PES c/o Stantec
ELLE Sample #: WW 9995297
ELLE Group #: 2031387
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	
10335	Acetone	67-64-1	11	J	0.8	1
10335	Benzene	71-43-2	1		0.2	1
10335	Bromodichloromethane	75-27-4	N.D.		0.2	1
10335	Bromoform	75-25-2	N.D.		2	1
10335	Bromomethane	74-83-9	N.D.		0.5	1
10335	2-Butanone	78-93-3	2	J	1	1
10335	Carbon Disulfide	75-15-0	N.D.		0.3	1
10335	Carbon Tetrachloride	56-23-5	N.D.		0.2	1
10335	Chlorobenzene	108-90-7	N.D.		0.2	1
10335	Chloroethane	75-00-3	N.D.		0.3	1
10335	Chloroform	67-66-3	N.D.		0.2	1
10335	Chloromethane	74-87-3	N.D.		0.3	1
10335	Cyclohexane	110-82-7	12		2	1
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.		1	1
10335	Dibromochloromethane	124-48-1	N.D.		0.4	1
10335	1,2-Dibromoethane	106-93-4	N.D.		0.3	1
10335	1,2-Dichlorobenzene	95-50-1	N.D.		0.2	1
10335	1,3-Dichlorobenzene	541-73-1	N.D.		0.2	1
10335	1,4-Dichlorobenzene	106-46-7	N.D.		0.2	1
10335	Dichlorodifluoromethane	75-71-8	N.D.		0.3	1
10335	1,1-Dichloroethane	75-34-3	N.D.		0.2	1
10335	1,2-Dichloroethane	107-06-2	N.D.		2	1
10335	1,1-Dichloroethene	75-35-4	N.D.		0.2	1
10335	cis-1,2-Dichloroethene	156-59-2	N.D.		0.2	1
10335	trans-1,2-Dichloroethene	156-60-5	N.D.		0.2	1
10335	1,2-Dichloropropane	78-87-5	N.D.		0.2	1
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.		0.2	1
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.		0.2	1
10335	Ethylbenzene	100-41-4	0.3	J	0.2	1
10335	Freon 113	76-13-1	N.D.		2	1
10335	2-Hexanone	591-78-6	N.D.		3	1
10335	Isopropylbenzene	98-82-8	17		0.3	1
10335	Methyl Acetate	79-20-9	N.D.		0.6	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.2	1
10335	4-Methyl-2-pentanone	108-10-1	N.D.		0.5	1
10335	Methylcyclohexane	108-87-2	50		0.2	1
10335	Methylene Chloride	75-09-2	1	B	0.2	1
10335	Styrene	100-42-5	N.D.		0.2	1
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.		0.2	1
10335	Tetrachloroethene	127-18-4	N.D.		0.2	1
10335	Toluene	108-88-3	0.2	J	0.2	1
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.		0.4	1
10335	1,1,1-Trichloroethane	71-55-6	N.D.		0.2	1
10335	1,1,2-Trichloroethane	79-00-5	N.D.		0.2	1
10335	Trichloroethene	79-01-6	N.D.		0.2	1
10335	Trichlorofluoromethane	75-69-4	N.D.		0.4	1
10335	Vinyl Chloride	75-01-4	N.D.		0.4	1
10335	Xylene (Total)	1330-20-7	N.D.		0.5	1

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Sample Description: **S-413_20190226 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 14:10

PES c/o Stantec
ELLE Sample #: WW 9995297
ELLE Group #: 2031387
Matrix: Groundwater

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190641AA	03/05/2019 15:51	Jennifer K Howe	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190641AA	03/05/2019 15:50	Jennifer K Howe	1

Sample Description: **EB_20190226-01 Grab Water**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 14:20

PES c/o Stantec
ELLE Sample #: WW 9995298
ELLE Group #: 2031387
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	Acetone	67-64-1	N.D.	0.8	1
10335	Benzene	71-43-2	N.D.	0.2	1
10335	Bromodichloromethane	75-27-4	N.D.	0.2	1
10335	Bromoform	75-25-2	N.D.	2	1
10335	Bromomethane	74-83-9	N.D.	0.5	1
10335	2-Butanone	78-93-3	N.D.	1	1
10335	Carbon Disulfide	75-15-0	N.D.	0.3	1
10335	Carbon Tetrachloride	56-23-5	N.D.	0.2	1
10335	Chlorobenzene	108-90-7	N.D.	0.2	1
10335	Chloroethane	75-00-3	N.D.	0.3	1
10335	Chloroform	67-66-3	1	0.2	1
10335	Chloromethane	74-87-3	N.D.	0.3	1
10335	Cyclohexane	110-82-7	N.D.	2	1
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.	1	1
10335	Dibromochloromethane	124-48-1	N.D.	0.4	1
10335	1,2-Dibromoethane	106-93-4	N.D.	0.3	1
10335	1,2-Dichlorobenzene	95-50-1	N.D.	0.2	1
10335	1,3-Dichlorobenzene	541-73-1	N.D.	0.2	1
10335	1,4-Dichlorobenzene	106-46-7	N.D.	0.2	1
10335	Dichlorodifluoromethane	75-71-8	N.D.	0.3	1
10335	1,1-Dichloroethane	75-34-3	N.D.	0.2	1
10335	1,2-Dichloroethane	107-06-2	N.D.	2	1
10335	1,1-Dichloroethene	75-35-4	N.D.	0.2	1
10335	cis-1,2-Dichloroethene	156-59-2	N.D.	0.2	1
10335	trans-1,2-Dichloroethene	156-60-5	N.D.	0.2	1
10335	1,2-Dichloropropane	78-87-5	N.D.	0.2	1
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.	0.2	1
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.	0.2	1
10335	Ethylbenzene	100-41-4	N.D.	0.2	1
10335	Freon 113	76-13-1	N.D.	2	1
10335	2-Hexanone	591-78-6	N.D.	3	1
10335	Isopropylbenzene	98-82-8	N.D.	0.3	1
10335	Methyl Acetate	79-20-9	N.D.	0.6	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.2	1
10335	4-Methyl-2-pentanone	108-10-1	N.D.	0.5	1
10335	Methylcyclohexane	108-87-2	N.D.	0.2	1
10335	Methylene Chloride	75-09-2	0.3 J B	0.2	1
10335	Styrene	100-42-5	N.D.	0.2	1
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.2	1
10335	Tetrachloroethene	127-18-4	N.D.	0.2	1
10335	Toluene	108-88-3	N.D.	0.2	1
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.4	1
10335	1,1,1-Trichloroethane	71-55-6	N.D.	0.2	1
10335	1,1,2-Trichloroethane	79-00-5	N.D.	0.2	1
10335	Trichloroethene	79-01-6	N.D.	0.2	1
10335	Trichlorofluoromethane	75-69-4	N.D.	0.4	1
10335	Vinyl Chloride	75-01-4	N.D.	0.4	1
10335	Xylene (Total)	1330-20-7	N.D.	0.5	1

Sample Description: **EB_20190226-01 Grab Water**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 14:20

PES c/o Stantec
ELLE Sample #: **WW 9995298**
ELLE Group #: **2031387**
Matrix: Water

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190641AA	03/05/2019 10:43	Jennifer K Howe	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190641AA	03/05/2019 10:42	Jennifer K Howe	1

Sample Description: **EB_20190226-02 Grab Water**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 14:25

PES c/o Stantec
ELLE Sample #: WW 9995299
ELLE Group #: 2031387
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	Acetone	67-64-1	N.D.	0.8	1
10335	Benzene	71-43-2	N.D.	0.2	1
10335	Bromodichloromethane	75-27-4	N.D.	0.2	1
10335	Bromoform	75-25-2	N.D.	2	1
10335	Bromomethane	74-83-9	N.D.	0.5	1
10335	2-Butanone	78-93-3	N.D.	1	1
10335	Carbon Disulfide	75-15-0	N.D.	0.3	1
10335	Carbon Tetrachloride	56-23-5	N.D.	0.2	1
10335	Chlorobenzene	108-90-7	N.D.	0.2	1
10335	Chloroethane	75-00-3	N.D.	0.3	1
10335	Chloroform	67-66-3	1	0.2	1
10335	Chloromethane	74-87-3	N.D.	0.3	1
10335	Cyclohexane	110-82-7	N.D.	2	1
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.	1	1
10335	Dibromochloromethane	124-48-1	N.D.	0.4	1
10335	1,2-Dibromoethane	106-93-4	N.D.	0.3	1
10335	1,2-Dichlorobenzene	95-50-1	N.D.	0.2	1
10335	1,3-Dichlorobenzene	541-73-1	N.D.	0.2	1
10335	1,4-Dichlorobenzene	106-46-7	N.D.	0.2	1
10335	Dichlorodifluoromethane	75-71-8	N.D.	0.3	1
10335	1,1-Dichloroethane	75-34-3	N.D.	0.2	1
10335	1,2-Dichloroethane	107-06-2	N.D.	2	1
10335	1,1-Dichloroethene	75-35-4	N.D.	0.2	1
10335	cis-1,2-Dichloroethene	156-59-2	N.D.	0.2	1
10335	trans-1,2-Dichloroethene	156-60-5	N.D.	0.2	1
10335	1,2-Dichloropropane	78-87-5	N.D.	0.2	1
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.	0.2	1
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.	0.2	1
10335	Ethylbenzene	100-41-4	N.D.	0.2	1
10335	Freon 113	76-13-1	N.D.	2	1
10335	2-Hexanone	591-78-6	N.D.	3	1
10335	Isopropylbenzene	98-82-8	N.D.	0.3	1
10335	Methyl Acetate	79-20-9	N.D.	0.6	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.2	1
10335	4-Methyl-2-pentanone	108-10-1	N.D.	0.5	1
10335	Methylcyclohexane	108-87-2	N.D.	0.2	1
10335	Methylene Chloride	75-09-2	0.4 J B	0.2	1
10335	Styrene	100-42-5	N.D.	0.2	1
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.2	1
10335	Tetrachloroethene	127-18-4	N.D.	0.2	1
10335	Toluene	108-88-3	N.D.	0.2	1
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.4	1
10335	1,1,1-Trichloroethane	71-55-6	N.D.	0.2	1
10335	1,1,2-Trichloroethane	79-00-5	N.D.	0.2	1
10335	Trichloroethene	79-01-6	N.D.	0.2	1
10335	Trichlorofluoromethane	75-69-4	N.D.	0.4	1
10335	Vinyl Chloride	75-01-4	N.D.	0.4	1
10335	Xylene (Total)	1330-20-7	N.D.	0.5	1

Sample Description: **EB_20190226-02 Grab Water**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/26/2019 14:25

PES c/o Stantec
ELLE Sample #: **WW 9995299**
ELLE Group #: **2031387**
Matrix: Water

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190641AA	03/05/2019 11:05	Jennifer K Howe	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190641AA	03/05/2019 11:04	Jennifer K Howe	1

Sample Description: **TRIP BLANK-2 Water**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/21/2019

PES c/o Stantec
ELLE Sample #: WW 9995300
ELLE Group #: 2031387
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	Acetone	67-64-1	N.D.	0.8	1
10335	Benzene	71-43-2	N.D.	0.2	1
10335	Bromodichloromethane	75-27-4	N.D.	0.2	1
10335	Bromoform	75-25-2	N.D.	2	1
10335	Bromomethane	74-83-9	N.D.	0.5	1
10335	2-Butanone	78-93-3	N.D.	1	1
10335	Carbon Disulfide	75-15-0	N.D.	0.3	1
10335	Carbon Tetrachloride	56-23-5	N.D.	0.2	1
10335	Chlorobenzene	108-90-7	N.D.	0.2	1
10335	Chloroethane	75-00-3	N.D.	0.3	1
10335	Chloroform	67-66-3	N.D.	0.2	1
10335	Chloromethane	74-87-3	N.D.	0.3	1
10335	Cyclohexane	110-82-7	N.D.	2	1
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.	1	1
10335	Dibromochloromethane	124-48-1	N.D.	0.4	1
10335	1,2-Dibromoethane	106-93-4	N.D.	0.3	1
10335	1,2-Dichlorobenzene	95-50-1	N.D.	0.2	1
10335	1,3-Dichlorobenzene	541-73-1	N.D.	0.2	1
10335	1,4-Dichlorobenzene	106-46-7	N.D.	0.2	1
10335	Dichlorodifluoromethane	75-71-8	N.D.	0.3	1
10335	1,1-Dichloroethane	75-34-3	N.D.	0.2	1
10335	1,2-Dichloroethane	107-06-2	N.D.	2	1
10335	1,1-Dichloroethene	75-35-4	N.D.	0.2	1
10335	cis-1,2-Dichloroethene	156-59-2	N.D.	0.2	1
10335	trans-1,2-Dichloroethene	156-60-5	N.D.	0.2	1
10335	1,2-Dichloropropane	78-87-5	N.D.	0.2	1
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.	0.2	1
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.	0.2	1
10335	Ethylbenzene	100-41-4	N.D.	0.2	1
10335	Freon 113	76-13-1	N.D.	2	1
10335	2-Hexanone	591-78-6	N.D.	3	1
10335	Isopropylbenzene	98-82-8	N.D.	0.3	1
10335	Methyl Acetate	79-20-9	N.D.	0.6	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.2	1
10335	4-Methyl-2-pentanone	108-10-1	N.D.	0.5	1
10335	Methylcyclohexane	108-87-2	N.D.	0.2	1
10335	Methylene Chloride	75-09-2	0.3 J B	0.2	1
10335	Styrene	100-42-5	N.D.	0.2	1
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.2	1
10335	Tetrachloroethene	127-18-4	N.D.	0.2	1
10335	Toluene	108-88-3	N.D.	0.2	1
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.4	1
10335	1,1,1-Trichloroethane	71-55-6	N.D.	0.2	1
10335	1,1,2-Trichloroethane	79-00-5	N.D.	0.2	1
10335	Trichloroethene	79-01-6	N.D.	0.2	1
10335	Trichlorofluoromethane	75-69-4	N.D.	0.4	1
10335	Vinyl Chloride	75-01-4	N.D.	0.4	1
10335	Xylene (Total)	1330-20-7	N.D.	0.5	1

Sample Description: **TRIP BLANK-2 Water**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/21/2019

PES c/o Stantec
ELLE Sample #: WW 9995300
ELLE Group #: 2031387
Matrix: Water

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190641AA	03/05/2019 11:27	Jennifer K Howe	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190641AA	03/05/2019 11:26	Jennifer K Howe	1

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Quality Control Summary

Client Name: PES c/o Stantec
Reported: 03/07/2019 13:40

Group Number: 2031387

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	MDL
	ug/l	ug/l
Batch number: Y190641AA	Sample number(s): 9995291-9995300	
Acetone	N.D.	0.8
Benzene	N.D.	0.2
Bromodichloromethane	N.D.	0.2
Bromoform	N.D.	2
Bromomethane	N.D.	0.5
2-Butanone	N.D.	1
Carbon Disulfide	N.D.	0.3
Carbon Tetrachloride	N.D.	0.2
Chlorobenzene	N.D.	0.2
Chloroethane	N.D.	0.3
Chloroform	N.D.	0.2
Chloromethane	N.D.	0.3
Cyclohexane	N.D.	2
1,2-Dibromo-3-chloropropane	N.D.	1
Dibromochloromethane	N.D.	0.4
1,2-Dibromoethane	N.D.	0.3
1,2-Dichlorobenzene	N.D.	0.2
1,3-Dichlorobenzene	N.D.	0.2
1,4-Dichlorobenzene	N.D.	0.2
Dichlorodifluoromethane	N.D.	0.3
1,1-Dichloroethane	N.D.	0.2
1,2-Dichloroethane	N.D.	2
1,1-Dichloroethene	N.D.	0.2
cis-1,2-Dichloroethene	N.D.	0.2
trans-1,2-Dichloroethene	N.D.	0.2
1,2-Dichloropropane	N.D.	0.2
cis-1,3-Dichloropropene	N.D.	0.2
trans-1,3-Dichloropropene	N.D.	0.2
Ethylbenzene	N.D.	0.2
Freon 113	N.D.	2
2-Hexanone	N.D.	3
Isopropylbenzene	N.D.	0.3
Methyl Acetate	N.D.	0.6
Methyl Tertiary Butyl Ether	N.D.	0.2
4-Methyl-2-pentanone	N.D.	0.5
Methylcyclohexane	N.D.	0.2
Methylene Chloride	0.2 J	0.2
Styrene	N.D.	0.2
1,1,2,2-Tetrachloroethane	N.D.	0.2

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: PES c/o Stantec
Reported: 03/07/2019 13:40

Group Number: 2031387

Method Blank (continued)

Analysis Name	Result ug/l	MDL ug/l
Tetrachloroethene	N.D.	0.2
Toluene	N.D.	0.2
1,2,4-Trichlorobenzene	N.D.	0.4
1,1,1-Trichloroethane	N.D.	0.2
1,1,2-Trichloroethane	N.D.	0.2
Trichloroethene	N.D.	0.2
Trichlorofluoromethane	N.D.	0.4
Vinyl Chloride	N.D.	0.4
Xylene (Total)	N.D.	0.5

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: Y190641AA	Sample number(s): 9995291-9995300								
Acetone	150	156.42	150	158.3	104	106	54-157	1	30
Benzene	20	21.8	20	21.59	109	108	80-120	1	30
Bromodichloromethane	20	20.43	20	20.49	102	102	71-120	0	30
Bromoform	20	18.53	20	18.17	93	91	51-120	2	30
Bromomethane	20	15.12	20	14.87	76	74	53-128	2	30
2-Butanone	150	142.08	150	143.8	95	96	59-135	1	30
Carbon Disulfide	20	21.04	20	20.66	105	103	65-128	2	30
Carbon Tetrachloride	20	20.99	20	20.68	105	103	64-134	1	30
Chlorobenzene	20	21.45	20	21.33	107	107	80-120	1	30
Chloroethane	20	16.35	20	16.36	82	82	55-123	0	30
Chloroform	20	21.39	20	21.03	107	105	80-120	2	30
Chloromethane	20	17.43	20	17.14	87	86	56-121	2	30
Cyclohexane	20	19.72	20	19.6	99	98	68-126	1	30
1,2-Dibromo-3-chloropropane	20	19.67	20	19.82	98	99	47-131	1	30
Dibromochloromethane	20	20.13	20	19.82	101	99	71-120	2	30
1,2-Dibromoethane	20	21.04	20	20.97	105	105	77-120	0	30
1,2-Dichlorobenzene	20	21.74	20	21.56	109	108	80-120	1	30
1,3-Dichlorobenzene	20	21.61	20	21.4	108	107	80-120	1	30
1,4-Dichlorobenzene	20	21.92	20	21.59	110	108	80-120	2	30
Dichlorodifluoromethane	20	14	20	13.88	70	69	41-127	1	30
1,1-Dichloroethane	20	21.15	20	20.98	106	105	80-120	1	30
1,2-Dichloroethane	20	20.02	20	20.11	100	101	73-124	0	30
1,1-Dichloroethene	20	23.56	20	23.38	118	117	80-131	1	30
cis-1,2-Dichloroethene	20	22.39	20	21.98	112	110	80-120	2	30
trans-1,2-Dichloroethene	20	22.54	20	22.29	113	111	80-120	1	30
1,2-Dichloropropane	20	21.8	20	22.01	109	110	80-120	1	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: PES c/o Stantec
Reported: 03/07/2019 13:40

Group Number: 2031387

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
cis-1,3-Dichloropropene	20	20.34	20	20.37	102	102	75-120	0	30
trans-1,3-Dichloropropene	20	19.54	20	19.43	98	97	67-120	1	30
Ethylbenzene	20	21.11	20	20.81	106	104	80-120	1	30
Freon 113	20	22.47	20	22.3	112	111	73-139	1	30
2-Hexanone	100	96.08	100	95.41	96	95	56-135	1	30
Isopropylbenzene	20	20.89	20	20.62	104	103	80-120	1	30
Methyl Acetate	20	19.69	20	19.7	98	98	54-136	0	30
Methyl Tertiary Butyl Ether	20	19.55	20	19.62	98	98	69-122	0	30
4-Methyl-2-pentanone	100	93.6	100	93.22	94	93	62-133	0	30
Methylcyclohexane	20	18.45	20	18.43	92	92	67-121	0	30
Methylene Chloride	20	22.58	20	22.03	113	110	80-120	2	30
Styrene	20	21.08	20	20.76	105	104	80-120	2	30
1,1,2,2-Tetrachloroethane	20	21.56	20	21.62	108	108	72-120	0	30
Tetrachloroethene	20	21.08	20	21.05	105	105	80-120	0	30
Toluene	20	21.39	20	21.04	107	105	80-120	2	30
1,2,4-Trichlorobenzene	20	20.44	20	20.37	102	102	63-120	0	30
1,1,1-Trichloroethane	20	20.63	20	20.84	103	104	67-126	1	30
1,1,2-Trichloroethane	20	22.12	20	22.14	111	111	80-120	0	30
Trichloroethene	20	21.51	20	21.52	108	108	80-120	0	30
Trichlorofluoromethane	20	17.72	20	17.07	89	85	55-135	4	30
Vinyl Chloride	20	17.33	20	17.04	87	85	56-120	2	30
Xylene (Total)	60	63.54	60	62.69	106	104	80-120	1	30

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: TCL (4.3) 8260 Water
Batch number: Y190641AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
9995291	108	114	103	98
9995292	111	113	102	96
9995293	103	110	108	99
9995294	109	114	102	99
9995295	103	108	106	100
9995296	107	111	103	96
9995297	103	110	106	103
9995298	108	112	103	97
9995299	110	114	103	97
9995300	109	112	103	97
Blank	106	112	104	100

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

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Quality Control Summary

Client Name: PES c/o Stantec
Group Number: 2031387
Reported: 03/07/2019 13:40

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: TCL (4.3) 8260 Water
Batch number: Y190641AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
LCS	105	110	106	106
LCSD	104	109	106	105
Limits:	80-120	80-120	80-120	80-120

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # 42093 Group # 2031387 Sample # 9995-29/-3000

COC # 565907

Client Information

Client: Stantec

Acct. #: PES

Project Name/#: 213405039 PES Reformat GWS ~~Andrew Kilhgbeil~~

PWSID #:

Project Manager: Andrew Kilhgbeil

P.O. #: 213403039

Sampler: Ian Andree / Dane Hopkins

Quote #:

State where samples were collected: PA

For Compliance: Yes ☐ No ☐

Matrix

Soil ☐ Sediment ☐ Tissue ☐ | Water: Potable ☐ Ground ☒ NPDES ☐ Surface ☐ | Other: equipment blank / trip blank

Analysis Requested

Preservation and Filtration Codes

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	#	VOCs 8260
C-129D-20190226	2/26/19	0911	X		3		X
S-280D-20190226	2/26/19	1015	X		3		X
S-284D-20190226	2/26/19	1059	X		3		X
S-69D-20190226	2/26/19	1155	X		3		X
C-174-20190226	2/26/19	1232	X		3		X
BF-103R-20190226	2/26/19	1330	X		3		X
S-413-20190226	2/26/19	1410	X		3		X
EB-20190226-01	2/26/19	1420	X		3		X
EB-20190226-02	2/26/19	1425	X		3		X
TRIP BLANK-2	2/2/19	—	X		2		X

For Lab Use Only

FSC:

SCR#:

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 P=H_3PO_4
F=Field Filtered O=Other

Remarks

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days:

E-mail address: andrew.kilhgbeil@stantec.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
	2.25.19	1121		2.25.19	1121
	2.25.19	1250			
				2/28/19	12:50

EDD Required? Yes No

If yes, format: EQuIS

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS FedEx Other

Temperature upon receipt 1.1 °C

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Sample Administration Receipt Documentation Log

Doc Log ID: 242347

Group Number(s): 2031387

Client: Stantec

Delivery and Receipt Information

Delivery Method:	ELLE Courier	Arrival Timestamp:	02/28/2019 12:50
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	Pennsylvania		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	Yes	VOA Vial Headspace ≥ 6mm:	No
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	6
Samples Intact:	Yes	Trip Blank Type:	HCL
Missing Samples:	No	Air Quality Samples Present:	No
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Juan Carrion (16518) at 15:58 on 02/28/2019

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT42-03	1.1	DT	Wet	Y	Bagged	N

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Lancaster, PA 17605-2425
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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mL**	milliliter(s)
C	degrees Celsius	**MPN**	Most Probable Number
cfu	colony forming units	**N.D.**	non-detect
CP Units	cobalt-chloroplatinate units	**ng**	nanogram(s)
F	degrees Fahrenheit	**NTU**	nephelometric turbidity units
g	gram(s)	**pg/L**	picogram/liter
IU	International Units	**RL**	Reporting Limit
kg	kilogram(s)	**TNTC**	Too Numerous To Count
L	liter(s)	**µg**	microgram(s)
lb.	pound(s)	**µL**	microliter(s)
m3	cubic meter(s)	**umhos/cm**	micromhos/cm
meq	milliequivalents	**MCL**	Maximum Contamination Limit
mg	milligram(s)		

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

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Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value >= the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column >40%. The lower result is reported.
P^	Concentration difference between the primary and confirmation column > 40%. The higher result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report
B	Detection in the Blank
Q0	LCS/LCSD Low
Q1	LCS/LCSD High
Q2	MS/MSD Low
Q3	MS/MSD High
Q7	LCS/LCSD RPD
Q8	DUP RPD
Q9	MS/MSD RPD

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

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ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

PES c/o Stantec
1060 Andrew Drive
Suite 140
West Chester PA 19380

Report Date: March 08, 2019 22:28

Project: PES Reformate GWs

Account #: 42093
Group Number: 2031389
PO Number: PES REFORMATE
State of Sample Origin: PA

Electronic Copy To	PES c/o Stantec	Attn: Andrew Bradley
Electronic Copy To	PES c/o Stantec	Attn: Andrew Klingbeil

Respectfully Submitted,

Amek Carter
Specialist

(717) 556-7252

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SAMPLE INFORMATION

Client Sample Description	Sample Collection Date/Time	ELLE#
BF-99_20190227 Grab Groundwater	02/27/2019 10:15	9995311
BF-106_20190227 Grab Groundwater	02/27/2019 10:50	9995312
S-411_20190227 Grab Groundwater	02/27/2019 08:41	9995313
S-284_20190227 Grab Groundwater	02/27/2019 09:17	9995314
S-412_20190227 Grab Groundwater	02/27/2019 11:23	9995315
S-383_20190227 Grab Groundwater	02/27/2019 11:45	9995316
S-280_20190227 Grab Groundwater	02/27/2019 12:55	9995317
S-428_20190227 Grab Groundwater	02/27/2019 12:15	9995318
EB_20190227-1 Grab Water	02/27/2019 14:30	9995319
EB_20190227-2 Grab Water	02/27/2019 14:40	9995320

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Sample Description: **BF-99_20190227 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/27/2019 10:15

PES c/o Stantec
ELLE Sample #: WW 9995311
ELLE Group #: 2031389
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	
10335	Acetone	67-64-1	11	J	0.8	1
10335	Benzene	71-43-2	100		0.2	1
10335	Bromodichloromethane	75-27-4	N.D.		0.2	1
10335	Bromoform	75-25-2	N.D.		2	1
10335	Bromomethane	74-83-9	N.D.		0.5	1
10335	2-Butanone	78-93-3	N.D.		1	1
10335	Carbon Disulfide	75-15-0	N.D.		0.3	1
10335	Carbon Tetrachloride	56-23-5	N.D.		0.2	1
10335	Chlorobenzene	108-90-7	N.D.		0.2	1
10335	Chloroethane	75-00-3	N.D.		0.3	1
10335	Chloroform	67-66-3	N.D.		0.2	1
10335	Chloromethane	74-87-3	N.D.		0.3	1
10335	Cyclohexane	110-82-7	7		2	1
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.		1	1
10335	Dibromochloromethane	124-48-1	N.D.		0.4	1
10335	1,2-Dibromoethane	106-93-4	N.D.		0.3	1
10335	1,2-Dichlorobenzene	95-50-1	N.D.		0.2	1
10335	1,3-Dichlorobenzene	541-73-1	N.D.		0.2	1
10335	1,4-Dichlorobenzene	106-46-7	N.D.		0.2	1
10335	Dichlorodifluoromethane	75-71-8	N.D.		0.3	1
10335	1,1-Dichloroethane	75-34-3	N.D.		0.2	1
10335	1,2-Dichloroethane	107-06-2	N.D.		2	1
10335	1,1-Dichloroethene	75-35-4	N.D.		0.2	1
10335	cis-1,2-Dichloroethene	156-59-2	N.D.		0.2	1
10335	trans-1,2-Dichloroethene	156-60-5	N.D.		0.2	1
10335	1,2-Dichloropropane	78-87-5	N.D.		0.2	1
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.		0.2	1
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.		0.2	1
10335	Ethylbenzene	100-41-4	0.2	J	0.2	1
10335	Freon 113	76-13-1	N.D.		2	1
10335	2-Hexanone	591-78-6	N.D.		3	1
10335	Isopropylbenzene	98-82-8	7		0.3	1
10335	Methyl Acetate	79-20-9	N.D.		0.6	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.2	1
10335	4-Methyl-2-pentanone	108-10-1	N.D.		0.5	1
10335	Methylcyclohexane	108-87-2	81		0.2	1
10335	Methylene Chloride	75-09-2	1	B	0.2	1
10335	Styrene	100-42-5	N.D.		0.2	1
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.		0.2	1
10335	Tetrachloroethene	127-18-4	N.D.		0.2	1
10335	Toluene	108-88-3	46		0.2	1
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.		0.4	1
10335	1,1,1-Trichloroethane	71-55-6	N.D.		0.2	1
10335	1,1,2-Trichloroethane	79-00-5	N.D.		0.2	1
10335	Trichloroethene	79-01-6	N.D.		0.2	1
10335	Trichlorofluoromethane	75-69-4	N.D.		0.4	1
10335	Vinyl Chloride	75-01-4	N.D.		0.4	1
10335	Xylene (Total)	1330-20-7	N.D.		0.5	1

Sample Description: **BF-99_20190227 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/27/2019 10:15

PES c/o Stantec
ELLE Sample #: WW 9995311
ELLE Group #: 2031389
Matrix: Groundwater

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190642AA	03/06/2019 01:40	Patrick T Herres	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190642AA	03/06/2019 01:39	Patrick T Herres	1

Sample Description: **BF-106_20190227 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/27/2019 10:50

PES c/o Stantec
ELLE Sample #: WW 9995312
ELLE Group #: 2031389
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	
10335	Acetone	67-64-1	12	J	0.8	1
10335	Benzene	71-43-2	91		0.2	1
10335	Bromodichloromethane	75-27-4	N.D.		0.2	1
10335	Bromoform	75-25-2	N.D.		2	1
10335	Bromomethane	74-83-9	N.D.		0.5	1
10335	2-Butanone	78-93-3	N.D.		1	1
10335	Carbon Disulfide	75-15-0	N.D.		0.3	1
10335	Carbon Tetrachloride	56-23-5	N.D.		0.2	1
10335	Chlorobenzene	108-90-7	N.D.		0.2	1
10335	Chloroethane	75-00-3	N.D.		0.3	1
10335	Chloroform	67-66-3	N.D.		0.2	1
10335	Chloromethane	74-87-3	N.D.		0.3	1
10335	Cyclohexane	110-82-7	170		20	10
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.		1	1
10335	Dibromochloromethane	124-48-1	N.D.		0.4	1
10335	1,2-Dibromoethane	106-93-4	N.D.		0.3	1
10335	1,2-Dichlorobenzene	95-50-1	N.D.		0.2	1
10335	1,3-Dichlorobenzene	541-73-1	N.D.		0.2	1
10335	1,4-Dichlorobenzene	106-46-7	N.D.		0.2	1
10335	Dichlorodifluoromethane	75-71-8	N.D.		0.3	1
10335	1,1-Dichloroethane	75-34-3	N.D.		0.2	1
10335	1,2-Dichloroethane	107-06-2	N.D.		2	1
10335	1,1-Dichloroethene	75-35-4	N.D.		0.2	1
10335	cis-1,2-Dichloroethene	156-59-2	N.D.		0.2	1
10335	trans-1,2-Dichloroethene	156-60-5	N.D.		0.2	1
10335	1,2-Dichloropropane	78-87-5	N.D.		0.2	1
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.		0.2	1
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.		0.2	1
10335	Ethylbenzene	100-41-4	5		0.2	1
10335	Freon 113	76-13-1	N.D.		2	1
10335	2-Hexanone	591-78-6	N.D.		3	1
10335	Isopropylbenzene	98-82-8	39		0.3	1
10335	Methyl Acetate	79-20-9	N.D.		0.6	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.2	1
10335	4-Methyl-2-pentanone	108-10-1	N.D.		0.5	1
10335	Methylcyclohexane	108-87-2	210		2	10
10335	Methylene Chloride	75-09-2	1	B	0.2	1
10335	Styrene	100-42-5	N.D.		0.2	1
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.		0.2	1
10335	Tetrachloroethene	127-18-4	N.D.		0.2	1
10335	Toluene	108-88-3	22		0.2	1
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.		0.4	1
10335	1,1,1-Trichloroethane	71-55-6	N.D.		0.2	1
10335	1,1,2-Trichloroethane	79-00-5	N.D.		0.2	1
10335	Trichloroethene	79-01-6	N.D.		0.2	1
10335	Trichlorofluoromethane	75-69-4	N.D.		0.4	1
10335	Vinyl Chloride	75-01-4	N.D.		0.4	1
10335	Xylene (Total)	1330-20-7	3	J	0.5	1

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Sample Description: **BF-106_20190227 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/27/2019 10:50

PES c/o Stantec
ELLE Sample #: WW 9995312
ELLE Group #: 2031389
Matrix: Groundwater

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190642AA	03/06/2019 02:24	Patrick T Herres	1
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190642AA	03/06/2019 02:46	Patrick T Herres	10
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190642AA	03/06/2019 02:23	Patrick T Herres	1
01163	GC/MS VOA Water Prep	SW-846 5030B	2	Y190642AA	03/06/2019 02:45	Patrick T Herres	10

Sample Description: **S-411_20190227 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/27/2019 08:41

PES c/o Stantec
ELLE Sample #: WW 9995313
ELLE Group #: 2031389
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	Acetone	67-64-1	16 J	0.8	1
10335	Benzene	71-43-2	7	0.2	1
10335	Bromodichloromethane	75-27-4	N.D.	0.2	1
10335	Bromoform	75-25-2	N.D.	2	1
10335	Bromomethane	74-83-9	N.D.	0.5	1
10335	2-Butanone	78-93-3	N.D.	1	1
10335	Carbon Disulfide	75-15-0	N.D.	0.3	1
10335	Carbon Tetrachloride	56-23-5	N.D.	0.2	1
10335	Chlorobenzene	108-90-7	N.D.	0.2	1
10335	Chloroethane	75-00-3	N.D.	0.3	1
10335	Chloroform	67-66-3	N.D.	0.2	1
10335	Chloromethane	74-87-3	N.D.	0.3	1
10335	Cyclohexane	110-82-7	N.D.	2	1
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.	1	1
10335	Dibromochloromethane	124-48-1	N.D.	0.4	1
10335	1,2-Dibromoethane	106-93-4	N.D.	0.3	1
10335	1,2-Dichlorobenzene	95-50-1	N.D.	0.2	1
10335	1,3-Dichlorobenzene	541-73-1	N.D.	0.2	1
10335	1,4-Dichlorobenzene	106-46-7	N.D.	0.2	1
10335	Dichlorodifluoromethane	75-71-8	N.D.	0.3	1
10335	1,1-Dichloroethane	75-34-3	N.D.	0.2	1
10335	1,2-Dichloroethane	107-06-2	N.D.	2	1
10335	1,1-Dichloroethene	75-35-4	N.D.	0.2	1
10335	cis-1,2-Dichloroethene	156-59-2	N.D.	0.2	1
10335	trans-1,2-Dichloroethene	156-60-5	N.D.	0.2	1
10335	1,2-Dichloropropane	78-87-5	N.D.	0.2	1
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.	0.2	1
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.	0.2	1
10335	Ethylbenzene	100-41-4	N.D.	0.2	1
10335	Freon 113	76-13-1	N.D.	2	1
10335	2-Hexanone	591-78-6	N.D.	3	1
10335	Isopropylbenzene	98-82-8	N.D.	0.3	1
10335	Methyl Acetate	79-20-9	N.D.	0.6	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.2	1
10335	4-Methyl-2-pentanone	108-10-1	N.D.	0.5	1
10335	Methylcyclohexane	108-87-2	1 J	0.2	1
10335	Methylene Chloride	75-09-2	1 J B	0.2	1
10335	Styrene	100-42-5	N.D.	0.2	1
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.2	1
10335	Tetrachloroethene	127-18-4	N.D.	0.2	1
10335	Toluene	108-88-3	N.D.	0.2	1
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.4	1
10335	1,1,1-Trichloroethane	71-55-6	N.D.	0.2	1
10335	1,1,2-Trichloroethane	79-00-5	N.D.	0.2	1
10335	Trichloroethene	79-01-6	N.D.	0.2	1
10335	Trichlorofluoromethane	75-69-4	N.D.	0.4	1
10335	Vinyl Chloride	75-01-4	N.D.	0.4	1
10335	Xylene (Total)	1330-20-7	N.D.	0.5	1

Sample Description: **S-411_20190227 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/27/2019 08:41

PES c/o Stantec
ELLE Sample #: WW 9995313
ELLE Group #: 2031389
Matrix: Groundwater

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190642AA	03/06/2019 03:08	Patrick T Herres	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190642AA	03/06/2019 03:07	Patrick T Herres	1

Sample Description: **S-284_20190227 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/27/2019 09:17

PES c/o Stantec
ELLE Sample #: WW 9995314
ELLE Group #: 2031389
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	Acetone	67-64-1	2 J	0.8	1
10335	Benzene	71-43-2	N.D.	0.2	1
10335	Bromodichloromethane	75-27-4	N.D.	0.2	1
10335	Bromoform	75-25-2	N.D.	2	1
10335	Bromomethane	74-83-9	N.D.	0.5	1
10335	2-Butanone	78-93-3	N.D.	1	1
10335	Carbon Disulfide	75-15-0	N.D.	0.3	1
10335	Carbon Tetrachloride	56-23-5	N.D.	0.2	1
10335	Chlorobenzene	108-90-7	N.D.	0.2	1
10335	Chloroethane	75-00-3	N.D.	0.3	1
10335	Chloroform	67-66-3	N.D.	0.2	1
10335	Chloromethane	74-87-3	N.D.	0.3	1
10335	Cyclohexane	110-82-7	N.D.	2	1
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.	1	1
10335	Dibromochloromethane	124-48-1	N.D.	0.4	1
10335	1,2-Dibromoethane	106-93-4	N.D.	0.3	1
10335	1,2-Dichlorobenzene	95-50-1	N.D.	0.2	1
10335	1,3-Dichlorobenzene	541-73-1	N.D.	0.2	1
10335	1,4-Dichlorobenzene	106-46-7	N.D.	0.2	1
10335	Dichlorodifluoromethane	75-71-8	N.D.	0.3	1
10335	1,1-Dichloroethane	75-34-3	N.D.	0.2	1
10335	1,2-Dichloroethane	107-06-2	N.D.	2	1
10335	1,1-Dichloroethene	75-35-4	N.D.	0.2	1
10335	cis-1,2-Dichloroethene	156-59-2	N.D.	0.2	1
10335	trans-1,2-Dichloroethene	156-60-5	N.D.	0.2	1
10335	1,2-Dichloropropane	78-87-5	N.D.	0.2	1
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.	0.2	1
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.	0.2	1
10335	Ethylbenzene	100-41-4	N.D.	0.2	1
10335	Freon 113	76-13-1	N.D.	2	1
10335	2-Hexanone	591-78-6	N.D.	3	1
10335	Isopropylbenzene	98-82-8	N.D.	0.3	1
10335	Methyl Acetate	79-20-9	N.D.	0.6	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.2	1
10335	4-Methyl-2-pentanone	108-10-1	N.D.	0.5	1
10335	Methylcyclohexane	108-87-2	N.D.	0.2	1
10335	Methylene Chloride	75-09-2	0.2 J B	0.2	1
10335	Styrene	100-42-5	N.D.	0.2	1
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.2	1
10335	Tetrachloroethene	127-18-4	N.D.	0.2	1
10335	Toluene	108-88-3	N.D.	0.2	1
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.4	1
10335	1,1,1-Trichloroethane	71-55-6	N.D.	0.2	1
10335	1,1,2-Trichloroethane	79-00-5	N.D.	0.2	1
10335	Trichloroethene	79-01-6	N.D.	0.2	1
10335	Trichlorofluoromethane	75-69-4	N.D.	0.4	1
10335	Vinyl Chloride	75-01-4	N.D.	0.4	1
10335	Xylene (Total)	1330-20-7	N.D.	0.5	1

Sample Description: **S-284_20190227 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/27/2019 09:17

PES c/o Stantec
ELLE Sample #: WW 9995314
ELLE Group #: 2031389
Matrix: Groundwater

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190642AA	03/06/2019 03:30	Patrick T Herres	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190642AA	03/06/2019 03:29	Patrick T Herres	1

Sample Description: **S-412_20190227 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/27/2019 11:23

PES c/o Stantec
ELLE Sample #: WW 9995315
ELLE Group #: 2031389
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	Acetone	67-64-1	N.D.	0.8	1
10335	Benzene	71-43-2	0.3 J	0.2	1
10335	Bromodichloromethane	75-27-4	N.D.	0.2	1
10335	Bromoform	75-25-2	N.D.	2	1
10335	Bromomethane	74-83-9	N.D.	0.5	1
10335	2-Butanone	78-93-3	N.D.	1	1
10335	Carbon Disulfide	75-15-0	N.D.	0.3	1
10335	Carbon Tetrachloride	56-23-5	N.D.	0.2	1
10335	Chlorobenzene	108-90-7	N.D.	0.2	1
10335	Chloroethane	75-00-3	N.D.	0.3	1
10335	Chloroform	67-66-3	N.D.	0.2	1
10335	Chloromethane	74-87-3	N.D.	0.3	1
10335	Cyclohexane	110-82-7	5 J	2	1
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.	1	1
10335	Dibromochloromethane	124-48-1	N.D.	0.4	1
10335	1,2-Dibromoethane	106-93-4	N.D.	0.3	1
10335	1,2-Dichlorobenzene	95-50-1	0.2 J	0.2	1
10335	1,3-Dichlorobenzene	541-73-1	N.D.	0.2	1
10335	1,4-Dichlorobenzene	106-46-7	N.D.	0.2	1
10335	Dichlorodifluoromethane	75-71-8	N.D.	0.3	1
10335	1,1-Dichloroethane	75-34-3	N.D.	0.2	1
10335	1,2-Dichloroethane	107-06-2	N.D.	2	1
10335	1,1-Dichloroethene	75-35-4	N.D.	0.2	1
10335	cis-1,2-Dichloroethene	156-59-2	N.D.	0.2	1
10335	trans-1,2-Dichloroethene	156-60-5	N.D.	0.2	1
10335	1,2-Dichloropropane	78-87-5	N.D.	0.2	1
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.	0.2	1
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.	0.2	1
10335	Ethylbenzene	100-41-4	N.D.	0.2	1
10335	Freon 113	76-13-1	N.D.	2	1
10335	2-Hexanone	591-78-6	N.D.	3	1
10335	Isopropylbenzene	98-82-8	27	0.3	1
10335	Methyl Acetate	79-20-9	N.D.	0.6	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.2	1
10335	4-Methyl-2-pentanone	108-10-1	N.D.	0.5	1
10335	Methylcyclohexane	108-87-2	300	0.2	1
10335	Methylene Chloride	75-09-2	0.8 J B	0.2	1
10335	Styrene	100-42-5	N.D.	0.2	1
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.2	1
10335	Tetrachloroethene	127-18-4	N.D.	0.2	1
10335	Toluene	108-88-3	N.D.	0.2	1
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.4	1
10335	1,1,1-Trichloroethane	71-55-6	N.D.	0.2	1
10335	1,1,2-Trichloroethane	79-00-5	N.D.	0.2	1
10335	Trichloroethene	79-01-6	N.D.	0.2	1
10335	Trichlorofluoromethane	75-69-4	N.D.	0.4	1
10335	Vinyl Chloride	75-01-4	N.D.	0.4	1
10335	Xylene (Total)	1330-20-7	N.D.	0.5	1

Sample Description: **S-412_20190227 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/27/2019 11:23

PES c/o Stantec
ELLE Sample #: WW 9995315
ELLE Group #: 2031389
Matrix: Groundwater

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190642AA	03/06/2019 03:52	Patrick T Herres	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190642AA	03/06/2019 03:51	Patrick T Herres	1

Sample Description: **S-383_20190227 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/27/2019 11:45

PES c/o Stantec
ELLE Sample #: WW 9995316
ELLE Group #: 2031389
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	Acetone	67-64-1	30	0.8	1
10335	Benzene	71-43-2	N.D.	0.2	1
10335	Bromodichloromethane	75-27-4	N.D.	0.2	1
10335	Bromoform	75-25-2	N.D.	2	1
10335	Bromomethane	74-83-9	N.D.	0.5	1
10335	2-Butanone	78-93-3	N.D.	1	1
10335	Carbon Disulfide	75-15-0	N.D.	0.3	1
10335	Carbon Tetrachloride	56-23-5	N.D.	0.2	1
10335	Chlorobenzene	108-90-7	N.D.	0.2	1
10335	Chloroethane	75-00-3	N.D.	0.3	1
10335	Chloroform	67-66-3	N.D.	0.2	1
10335	Chloromethane	74-87-3	N.D.	0.3	1
10335	Cyclohexane	110-82-7	N.D.	2	1
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.	1	1
10335	Dibromochloromethane	124-48-1	N.D.	0.4	1
10335	1,2-Dibromoethane	106-93-4	N.D.	0.3	1
10335	1,2-Dichlorobenzene	95-50-1	N.D.	0.2	1
10335	1,3-Dichlorobenzene	541-73-1	N.D.	0.2	1
10335	1,4-Dichlorobenzene	106-46-7	N.D.	0.2	1
10335	Dichlorodifluoromethane	75-71-8	N.D.	0.3	1
10335	1,1-Dichloroethane	75-34-3	N.D.	0.2	1
10335	1,2-Dichloroethane	107-06-2	N.D.	2	1
10335	1,1-Dichloroethene	75-35-4	N.D.	0.2	1
10335	cis-1,2-Dichloroethene	156-59-2	N.D.	0.2	1
10335	trans-1,2-Dichloroethene	156-60-5	N.D.	0.2	1
10335	1,2-Dichloropropane	78-87-5	N.D.	0.2	1
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.	0.2	1
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.	0.2	1
10335	Ethylbenzene	100-41-4	N.D.	0.2	1
10335	Freon 113	76-13-1	N.D.	2	1
10335	2-Hexanone	591-78-6	N.D.	3	1
10335	Isopropylbenzene	98-82-8	0.9 J	0.3	1
10335	Methyl Acetate	79-20-9	N.D.	0.6	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.2	1
10335	4-Methyl-2-pentanone	108-10-1	N.D.	0.5	1
10335	Methylcyclohexane	108-87-2	0.9 J	0.2	1
10335	Methylene Chloride	75-09-2	0.4 J B	0.2	1
10335	Styrene	100-42-5	N.D.	0.2	1
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.2	1
10335	Tetrachloroethene	127-18-4	N.D.	0.2	1
10335	Toluene	108-88-3	N.D.	0.2	1
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.4	1
10335	1,1,1-Trichloroethane	71-55-6	N.D.	0.2	1
10335	1,1,2-Trichloroethane	79-00-5	N.D.	0.2	1
10335	Trichloroethene	79-01-6	N.D.	0.2	1
10335	Trichlorofluoromethane	75-69-4	N.D.	0.4	1
10335	Vinyl Chloride	75-01-4	N.D.	0.4	1
10335	Xylene (Total)	1330-20-7	N.D.	0.5	1

Sample Description: **S-383_20190227 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/27/2019 11:45

PES c/o Stantec
ELLE Sample #: WW 9995316
ELLE Group #: 2031389
Matrix: Groundwater

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190642AA	03/06/2019 04:36	Patrick T Herres	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190642AA	03/06/2019 04:35	Patrick T Herres	1

Sample Description: **S-280_20190227 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/27/2019 12:55

PES c/o Stantec
ELLE Sample #: WW 9995317
ELLE Group #: 2031389
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	Acetone	67-64-1	N.D.	40	50
10335	Benzene	71-43-2	41,000	40	200
10335	Bromodichloromethane	75-27-4	N.D.	10	50
10335	Bromoform	75-25-2	N.D.	100	50
10335	Bromomethane	74-83-9	N.D.	25	50
10335	2-Butanone	78-93-3	N.D.	50	50
10335	Carbon Disulfide	75-15-0	N.D.	15	50
10335	Carbon Tetrachloride	56-23-5	N.D.	10	50
10335	Chlorobenzene	108-90-7	N.D.	10	50
10335	Chloroethane	75-00-3	N.D.	15	50
10335	Chloroform	67-66-3	N.D.	10	50
10335	Chloromethane	74-87-3	N.D.	15	50
10335	Cyclohexane	110-82-7	N.D.	100	50
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.	50	50
10335	Dibromochloromethane	124-48-1	N.D.	20	50
10335	1,2-Dibromoethane	106-93-4	N.D.	15	50
10335	1,2-Dichlorobenzene	95-50-1	N.D.	10	50
10335	1,3-Dichlorobenzene	541-73-1	N.D.	10	50
10335	1,4-Dichlorobenzene	106-46-7	N.D.	10	50
10335	Dichlorodifluoromethane	75-71-8	N.D.	15	50
10335	1,1-Dichloroethane	75-34-3	N.D.	10	50
10335	1,2-Dichloroethane	107-06-2	N.D.	100	50
10335	1,1-Dichloroethene	75-35-4	N.D.	10	50
10335	cis-1,2-Dichloroethene	156-59-2	N.D.	10	50
10335	trans-1,2-Dichloroethene	156-60-5	N.D.	10	50
10335	1,2-Dichloropropane	78-87-5	N.D.	10	50
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.	10	50
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.	10	50
10335	Ethylbenzene	100-41-4	N.D.	10	50
10335	Freon 113	76-13-1	N.D.	100	50
10335	2-Hexanone	591-78-6	N.D.	150	50
10335	Isopropylbenzene	98-82-8	N.D.	15	50
10335	Methyl Acetate	79-20-9	N.D.	30	50
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	10	50
10335	4-Methyl-2-pentanone	108-10-1	N.D.	25	50
10335	Methylcyclohexane	108-87-2	12 J	10	50
10335	Methylene Chloride	75-09-2	20 J B	10	50
10335	Styrene	100-42-5	N.D.	10	50
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	10	50
10335	Tetrachloroethene	127-18-4	N.D.	10	50
10335	Toluene	108-88-3	110	10	50
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.	20	50
10335	1,1,1-Trichloroethane	71-55-6	N.D.	10	50
10335	1,1,2-Trichloroethane	79-00-5	N.D.	10	50
10335	Trichloroethene	79-01-6	N.D.	10	50
10335	Trichlorofluoromethane	75-69-4	N.D.	20	50
10335	Vinyl Chloride	75-01-4	N.D.	20	50
10335	Xylene (Total)	1330-20-7	N.D.	25	50

Sample Description: **S-280_20190227 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/27/2019 12:55

PES c/o Stantec
ELLE Sample #: WW 9995317
ELLE Group #: 2031389
Matrix: Groundwater

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190642AA	03/06/2019 04:58	Patrick T Herres	200
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190652AA	03/07/2019 05:08	Patrick T Herres	50
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190642AA	03/06/2019 04:57	Patrick T Herres	200
01163	GC/MS VOA Water Prep	SW-846 5030B	2	Y190652AA	03/07/2019 05:07	Patrick T Herres	50

Sample Description: **S-428_20190227 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/27/2019 12:15

PES c/o Stantec
ELLE Sample #: WW 9995318
ELLE Group #: 2031389
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	Acetone	67-64-1	64	0.8	1
10335	Benzene	71-43-2	42	0.2	1
10335	Bromodichloromethane	75-27-4	N.D.	0.2	1
10335	Bromoform	75-25-2	N.D.	2	1
10335	Bromomethane	74-83-9	N.D.	0.5	1
10335	2-Butanone	78-93-3	N.D.	1	1
10335	Carbon Disulfide	75-15-0	0.6 J	0.3	1
10335	Carbon Tetrachloride	56-23-5	N.D.	0.2	1
10335	Chlorobenzene	108-90-7	N.D.	0.2	1
10335	Chloroethane	75-00-3	N.D.	0.3	1
10335	Chloroform	67-66-3	N.D.	0.2	1
10335	Chloromethane	74-87-3	N.D.	0.3	1
10335	Cyclohexane	110-82-7	200	2	1
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.	1	1
10335	Dibromochloromethane	124-48-1	N.D.	0.4	1
10335	1,2-Dibromoethane	106-93-4	N.D.	0.3	1
10335	1,2-Dichlorobenzene	95-50-1	N.D.	0.2	1
10335	1,3-Dichlorobenzene	541-73-1	N.D.	0.2	1
10335	1,4-Dichlorobenzene	106-46-7	N.D.	0.2	1
10335	Dichlorodifluoromethane	75-71-8	N.D.	0.3	1
10335	1,1-Dichloroethane	75-34-3	N.D.	0.2	1
10335	1,2-Dichloroethane	107-06-2	N.D.	2	1
10335	1,1-Dichloroethene	75-35-4	N.D.	0.2	1
10335	cis-1,2-Dichloroethene	156-59-2	N.D.	0.2	1
10335	trans-1,2-Dichloroethene	156-60-5	N.D.	0.2	1
10335	1,2-Dichloropropane	78-87-5	N.D.	0.2	1
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.	0.2	1
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.	0.2	1
10335	Ethylbenzene	100-41-4	20	0.2	1
10335	Freon 113	76-13-1	N.D.	2	1
10335	2-Hexanone	591-78-6	N.D.	3	1
10335	Isopropylbenzene	98-82-8	13	0.3	1
10335	Methyl Acetate	79-20-9	N.D.	0.6	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.2	1
10335	4-Methyl-2-pentanone	108-10-1	N.D.	0.5	1
10335	Methylcyclohexane	108-87-2	280	0.2	1
10335	Methylene Chloride	75-09-2	1 B	0.2	1
10335	Styrene	100-42-5	N.D.	0.2	1
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.2	1
10335	Tetrachloroethene	127-18-4	N.D.	0.2	1
10335	Toluene	108-88-3	0.5 J	0.2	1
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.4	1
10335	1,1,1-Trichloroethane	71-55-6	N.D.	0.2	1
10335	1,1,2-Trichloroethane	79-00-5	N.D.	0.2	1
10335	Trichloroethene	79-01-6	N.D.	0.2	1
10335	Trichlorofluoromethane	75-69-4	N.D.	0.4	1
10335	Vinyl Chloride	75-01-4	N.D.	0.4	1
10335	Xylene (Total)	1330-20-7	14	0.5	1

Sample Description: **S-428_20190227 Grab Groundwater**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/27/2019 12:15

PES c/o Stantec
ELLE Sample #: WW 9995318
ELLE Group #: 2031389
Matrix: Groundwater

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190642AA	03/06/2019 05:42	Patrick T Herres	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190642AA	03/06/2019 05:41	Patrick T Herres	1

Sample Description: **EB_20190227-1 Grab Water**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/27/2019 14:30

PES c/o Stantec
ELLE Sample #: WW 9995319
ELLE Group #: 2031389
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	Acetone	67-64-1	N.D.	0.8	1
10335	Benzene	71-43-2	N.D.	0.2	1
10335	Bromodichloromethane	75-27-4	N.D.	0.2	1
10335	Bromoform	75-25-2	N.D.	2	1
10335	Bromomethane	74-83-9	N.D.	0.5	1
10335	2-Butanone	78-93-3	N.D.	1	1
10335	Carbon Disulfide	75-15-0	N.D.	0.3	1
10335	Carbon Tetrachloride	56-23-5	N.D.	0.2	1
10335	Chlorobenzene	108-90-7	N.D.	0.2	1
10335	Chloroethane	75-00-3	N.D.	0.3	1
10335	Chloroform	67-66-3	1	0.2	1
10335	Chloromethane	74-87-3	N.D.	0.3	1
10335	Cyclohexane	110-82-7	N.D.	2	1
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.	1	1
10335	Dibromochloromethane	124-48-1	N.D.	0.4	1
10335	1,2-Dibromoethane	106-93-4	N.D.	0.3	1
10335	1,2-Dichlorobenzene	95-50-1	N.D.	0.2	1
10335	1,3-Dichlorobenzene	541-73-1	N.D.	0.2	1
10335	1,4-Dichlorobenzene	106-46-7	N.D.	0.2	1
10335	Dichlorodifluoromethane	75-71-8	N.D.	0.3	1
10335	1,1-Dichloroethane	75-34-3	N.D.	0.2	1
10335	1,2-Dichloroethane	107-06-2	N.D.	2	1
10335	1,1-Dichloroethene	75-35-4	N.D.	0.2	1
10335	cis-1,2-Dichloroethene	156-59-2	N.D.	0.2	1
10335	trans-1,2-Dichloroethene	156-60-5	N.D.	0.2	1
10335	1,2-Dichloropropane	78-87-5	N.D.	0.2	1
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.	0.2	1
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.	0.2	1
10335	Ethylbenzene	100-41-4	N.D.	0.2	1
10335	Freon 113	76-13-1	N.D.	2	1
10335	2-Hexanone	591-78-6	N.D.	3	1
10335	Isopropylbenzene	98-82-8	N.D.	0.3	1
10335	Methyl Acetate	79-20-9	N.D.	0.6	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.2	1
10335	4-Methyl-2-pentanone	108-10-1	N.D.	0.5	1
10335	Methylcyclohexane	108-87-2	N.D.	0.2	1
10335	Methylene Chloride	75-09-2	0.3 J B	0.2	1
10335	Styrene	100-42-5	N.D.	0.2	1
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.2	1
10335	Tetrachloroethene	127-18-4	N.D.	0.2	1
10335	Toluene	108-88-3	N.D.	0.2	1
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.4	1
10335	1,1,1-Trichloroethane	71-55-6	N.D.	0.2	1
10335	1,1,2-Trichloroethane	79-00-5	N.D.	0.2	1
10335	Trichloroethene	79-01-6	N.D.	0.2	1
10335	Trichlorofluoromethane	75-69-4	N.D.	0.4	1
10335	Vinyl Chloride	75-01-4	N.D.	0.4	1
10335	Xylene (Total)	1330-20-7	N.D.	0.5	1

Sample Description: **EB_20190227-1 Grab Water**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/27/2019 14:30

PES c/o Stantec
ELLE Sample #: **WW 9995319**
ELLE Group #: **2031389**
Matrix: Water

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190641AA	03/05/2019 11:49	Jennifer K Howe	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190641AA	03/05/2019 11:48	Jennifer K Howe	1

Sample Description: **EB_20190227-2 Grab Water**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/27/2019 14:40

PES c/o Stantec
ELLE Sample #: WW 9995320
ELLE Group #: 2031389
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	Acetone	67-64-1	N.D.	0.8	1
10335	Benzene	71-43-2	N.D.	0.2	1
10335	Bromodichloromethane	75-27-4	N.D.	0.2	1
10335	Bromoform	75-25-2	N.D.	2	1
10335	Bromomethane	74-83-9	N.D.	0.5	1
10335	2-Butanone	78-93-3	N.D.	1	1
10335	Carbon Disulfide	75-15-0	N.D.	0.3	1
10335	Carbon Tetrachloride	56-23-5	N.D.	0.2	1
10335	Chlorobenzene	108-90-7	N.D.	0.2	1
10335	Chloroethane	75-00-3	N.D.	0.3	1
10335	Chloroform	67-66-3	0.9 J	0.2	1
10335	Chloromethane	74-87-3	N.D.	0.3	1
10335	Cyclohexane	110-82-7	N.D.	2	1
10335	1,2-Dibromo-3-chloropropane	96-12-8	N.D.	1	1
10335	Dibromochloromethane	124-48-1	N.D.	0.4	1
10335	1,2-Dibromoethane	106-93-4	N.D.	0.3	1
10335	1,2-Dichlorobenzene	95-50-1	N.D.	0.2	1
10335	1,3-Dichlorobenzene	541-73-1	N.D.	0.2	1
10335	1,4-Dichlorobenzene	106-46-7	N.D.	0.2	1
10335	Dichlorodifluoromethane	75-71-8	N.D.	0.3	1
10335	1,1-Dichloroethane	75-34-3	N.D.	0.2	1
10335	1,2-Dichloroethane	107-06-2	N.D.	2	1
10335	1,1-Dichloroethene	75-35-4	N.D.	0.2	1
10335	cis-1,2-Dichloroethene	156-59-2	N.D.	0.2	1
10335	trans-1,2-Dichloroethene	156-60-5	N.D.	0.2	1
10335	1,2-Dichloropropane	78-87-5	N.D.	0.2	1
10335	cis-1,3-Dichloropropene	10061-01-5	N.D.	0.2	1
10335	trans-1,3-Dichloropropene	10061-02-6	N.D.	0.2	1
10335	Ethylbenzene	100-41-4	N.D.	0.2	1
10335	Freon 113	76-13-1	N.D.	2	1
10335	2-Hexanone	591-78-6	N.D.	3	1
10335	Isopropylbenzene	98-82-8	N.D.	0.3	1
10335	Methyl Acetate	79-20-9	N.D.	0.6	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.2	1
10335	4-Methyl-2-pentanone	108-10-1	N.D.	0.5	1
10335	Methylcyclohexane	108-87-2	N.D.	0.2	1
10335	Methylene Chloride	75-09-2	0.3 J B	0.2	1
10335	Styrene	100-42-5	N.D.	0.2	1
10335	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.2	1
10335	Tetrachloroethene	127-18-4	N.D.	0.2	1
10335	Toluene	108-88-3	N.D.	0.2	1
10335	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.4	1
10335	1,1,1-Trichloroethane	71-55-6	N.D.	0.2	1
10335	1,1,2-Trichloroethane	79-00-5	N.D.	0.2	1
10335	Trichloroethene	79-01-6	N.D.	0.2	1
10335	Trichlorofluoromethane	75-69-4	N.D.	0.4	1
10335	Vinyl Chloride	75-01-4	N.D.	0.4	1
10335	Xylene (Total)	1330-20-7	N.D.	0.5	1

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Sample Description: **EB_20190227-2 Grab Water**
PES Reformate GWs

Project Name: **PES Reformate GWs**

Submittal Date/Time: 02/28/2019 12:50
Collection Date/Time: 02/27/2019 14:40

PES c/o Stantec
ELLE Sample #: WW 9995320
ELLE Group #: 2031389
Matrix: Water

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/20.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	TCL (4.3) 8260 Water	SW-846 8260B	1	Y190641AA	03/05/2019 12:11	Jennifer K Howe	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y190641AA	03/05/2019 12:10	Jennifer K Howe	1

Quality Control Summary

Client Name: PES c/o Stantec
Reported: 03/08/2019 22:28

Group Number: 2031389

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	MDL
	ug/l	ug/l
Batch number: Y190641AA	Sample number(s): 9995319-9995320	
Acetone	N.D.	0.8
Benzene	N.D.	0.2
Bromodichloromethane	N.D.	0.2
Bromoform	N.D.	2
Bromomethane	N.D.	0.5
2-Butanone	N.D.	1
Carbon Disulfide	N.D.	0.3
Carbon Tetrachloride	N.D.	0.2
Chlorobenzene	N.D.	0.2
Chloroethane	N.D.	0.3
Chloroform	N.D.	0.2
Chloromethane	N.D.	0.3
Cyclohexane	N.D.	2
1,2-Dibromo-3-chloropropane	N.D.	1
Dibromochloromethane	N.D.	0.4
1,2-Dibromoethane	N.D.	0.3
1,2-Dichlorobenzene	N.D.	0.2
1,3-Dichlorobenzene	N.D.	0.2
1,4-Dichlorobenzene	N.D.	0.2
Dichlorodifluoromethane	N.D.	0.3
1,1-Dichloroethane	N.D.	0.2
1,2-Dichloroethane	N.D.	2
1,1-Dichloroethene	N.D.	0.2
cis-1,2-Dichloroethene	N.D.	0.2
trans-1,2-Dichloroethene	N.D.	0.2
1,2-Dichloropropane	N.D.	0.2
cis-1,3-Dichloropropene	N.D.	0.2
trans-1,3-Dichloropropene	N.D.	0.2
Ethylbenzene	N.D.	0.2
Freon 113	N.D.	2
2-Hexanone	N.D.	3
Isopropylbenzene	N.D.	0.3
Methyl Acetate	N.D.	0.6
Methyl Tertiary Butyl Ether	N.D.	0.2
4-Methyl-2-pentanone	N.D.	0.5
Methylcyclohexane	N.D.	0.2
Methylene Chloride	0.2 J	0.2
Styrene	N.D.	0.2
1,1,2,2-Tetrachloroethane	N.D.	0.2

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: PES c/o Stantec
Reported: 03/08/2019 22:28

Group Number: 2031389

Method Blank (continued)

Analysis Name	Result	MDL
	ug/l	ug/l
Tetrachloroethene	N.D.	0.2
Toluene	N.D.	0.2
1,2,4-Trichlorobenzene	N.D.	0.4
1,1,1-Trichloroethane	N.D.	0.2
1,1,2-Trichloroethane	N.D.	0.2
Trichloroethene	N.D.	0.2
Trichlorofluoromethane	N.D.	0.4
Vinyl Chloride	N.D.	0.4
Xylene (Total)	N.D.	0.5
Batch number: Y190642AA	Sample number(s): 9995311-9995318	
Acetone	N.D.	0.8
Benzene	N.D.	0.2
Bromodichloromethane	N.D.	0.2
Bromoform	N.D.	2
Bromomethane	N.D.	0.5
2-Butanone	N.D.	1
Carbon Disulfide	N.D.	0.3
Carbon Tetrachloride	N.D.	0.2
Chlorobenzene	N.D.	0.2
Chloroethane	N.D.	0.3
Chloroform	N.D.	0.2
Chloromethane	N.D.	0.3
Cyclohexane	N.D.	2
1,2-Dibromo-3-chloropropane	N.D.	1
Dibromochloromethane	N.D.	0.4
1,2-Dibromoethane	N.D.	0.3
1,2-Dichlorobenzene	N.D.	0.2
1,3-Dichlorobenzene	N.D.	0.2
1,4-Dichlorobenzene	N.D.	0.2
Dichlorodifluoromethane	N.D.	0.3
1,1-Dichloroethane	N.D.	0.2
1,2-Dichloroethane	N.D.	2
1,1-Dichloroethene	N.D.	0.2
cis-1,2-Dichloroethene	N.D.	0.2
trans-1,2-Dichloroethene	N.D.	0.2
1,2-Dichloropropane	N.D.	0.2
cis-1,3-Dichloropropene	N.D.	0.2
trans-1,3-Dichloropropene	N.D.	0.2
Ethylbenzene	N.D.	0.2
Freon 113	N.D.	2
2-Hexanone	N.D.	3
Isopropylbenzene	N.D.	0.3
Methyl Acetate	N.D.	0.6
Methyl Tertiary Butyl Ether	N.D.	0.2

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: PES c/o Stantec
Reported: 03/08/2019 22:28

Group Number: 2031389

Method Blank (continued)

Analysis Name	Result	MDL
	ug/l	ug/l
4-Methyl-2-pentanone	N.D.	0.5
Methylcyclohexane	N.D.	0.2
Methylene Chloride	0.2 J	0.2
Styrene	N.D.	0.2
1,1,2,2-Tetrachloroethane	N.D.	0.2
Tetrachloroethene	N.D.	0.2
Toluene	N.D.	0.2
1,2,4-Trichlorobenzene	N.D.	0.4
1,1,1-Trichloroethane	N.D.	0.2
1,1,2-Trichloroethane	N.D.	0.2
Trichloroethene	N.D.	0.2
Trichlorofluoromethane	N.D.	0.4
Vinyl Chloride	N.D.	0.4
Xylene (Total)	N.D.	0.5
Batch number: Y190652AA	Sample number(s): 9995317	
Acetone	N.D.	0.8
Bromodichloromethane	N.D.	0.2
Bromoform	N.D.	2
Bromomethane	N.D.	0.5
2-Butanone	N.D.	1
Carbon Disulfide	N.D.	0.3
Carbon Tetrachloride	N.D.	0.2
Chlorobenzene	N.D.	0.2
Chloroethane	N.D.	0.3
Chloroform	N.D.	0.2
Chloromethane	N.D.	0.3
Cyclohexane	N.D.	2
1,2-Dibromo-3-chloropropane	N.D.	1
Dibromochloromethane	N.D.	0.4
1,2-Dibromoethane	N.D.	0.3
1,2-Dichlorobenzene	N.D.	0.2
1,3-Dichlorobenzene	N.D.	0.2
1,4-Dichlorobenzene	N.D.	0.2
Dichlorodifluoromethane	N.D.	0.3
1,1-Dichloroethane	N.D.	0.2
1,2-Dichloroethane	N.D.	2
1,1-Dichloroethene	N.D.	0.2
cis-1,2-Dichloroethene	N.D.	0.2
trans-1,2-Dichloroethene	N.D.	0.2
1,2-Dichloropropane	N.D.	0.2
cis-1,3-Dichloropropene	N.D.	0.2
trans-1,3-Dichloropropene	N.D.	0.2
Ethylbenzene	N.D.	0.2
Freon 113	N.D.	2

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: PES c/o Stantec
Reported: 03/08/2019 22:28

Group Number: 2031389

Method Blank (continued)

Analysis Name	Result ug/l	MDL ug/l
2-Hexanone	N.D.	3
Isopropylbenzene	N.D.	0.3
Methyl Acetate	N.D.	0.6
Methyl Tertiary Butyl Ether	N.D.	0.2
4-Methyl-2-pentanone	N.D.	0.5
Methylcyclohexane	N.D.	0.2
Methylene Chloride	0.2 J	0.2
Styrene	N.D.	0.2
1,1,2,2-Tetrachloroethane	N.D.	0.2
Tetrachloroethene	N.D.	0.2
Toluene	N.D.	0.2
1,2,4-Trichlorobenzene	N.D.	0.4
1,1,1-Trichloroethane	N.D.	0.2
1,1,2-Trichloroethane	N.D.	0.2
Trichloroethene	N.D.	0.2
Trichlorofluoromethane	N.D.	0.4
Vinyl Chloride	N.D.	0.4
Xylene (Total)	N.D.	0.5

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: Y190641AA	Sample number(s): 9995319-9995320								
Acetone	150	156.42	150	158.3	104	106	54-157	1	30
Benzene	20	21.8	20	21.59	109	108	80-120	1	30
Bromodichloromethane	20	20.43	20	20.49	102	102	71-120	0	30
Bromoform	20	18.53	20	18.17	93	91	51-120	2	30
Bromomethane	20	15.12	20	14.87	76	74	53-128	2	30
2-Butanone	150	142.08	150	143.8	95	96	59-135	1	30
Carbon Disulfide	20	21.04	20	20.66	105	103	65-128	2	30
Carbon Tetrachloride	20	20.99	20	20.68	105	103	64-134	1	30
Chlorobenzene	20	21.45	20	21.33	107	107	80-120	1	30
Chloroethane	20	16.35	20	16.36	82	82	55-123	0	30
Chloroform	20	21.39	20	21.03	107	105	80-120	2	30
Chloromethane	20	17.43	20	17.14	87	86	56-121	2	30
Cyclohexane	20	19.72	20	19.6	99	98	68-126	1	30
1,2-Dibromo-3-chloropropane	20	19.67	20	19.82	98	99	47-131	1	30
Dibromochloromethane	20	20.13	20	19.82	101	99	71-120	2	30
1,2-Dibromoethane	20	21.04	20	20.97	105	105	77-120	0	30
1,2-Dichlorobenzene	20	21.74	20	21.56	109	108	80-120	1	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: PES c/o Stantec
Reported: 03/08/2019 22:28

Group Number: 2031389

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
1,3-Dichlorobenzene	20	21.61	20	21.4	108	107	80-120	1	30
1,4-Dichlorobenzene	20	21.92	20	21.59	110	108	80-120	2	30
Dichlorodifluoromethane	20	14	20	13.88	70	69	41-127	1	30
1,1-Dichloroethane	20	21.15	20	20.98	106	105	80-120	1	30
1,2-Dichloroethane	20	20.02	20	20.11	100	101	73-124	0	30
1,1-Dichloroethene	20	23.56	20	23.38	118	117	80-131	1	30
cis-1,2-Dichloroethene	20	22.39	20	21.98	112	110	80-120	2	30
trans-1,2-Dichloroethene	20	22.54	20	22.29	113	111	80-120	1	30
1,2-Dichloropropane	20	21.8	20	22.01	109	110	80-120	1	30
cis-1,3-Dichloropropene	20	20.34	20	20.37	102	102	75-120	0	30
trans-1,3-Dichloropropene	20	19.54	20	19.43	98	97	67-120	1	30
Ethylbenzene	20	21.11	20	20.81	106	104	80-120	1	30
Freon 113	20	22.47	20	22.3	112	111	73-139	1	30
2-Hexanone	100	96.08	100	95.41	96	95	56-135	1	30
Isopropylbenzene	20	20.89	20	20.62	104	103	80-120	1	30
Methyl Acetate	20	19.69	20	19.7	98	98	54-136	0	30
Methyl Tertiary Butyl Ether	20	19.55	20	19.62	98	98	69-122	0	30
4-Methyl-2-pentanone	100	93.6	100	93.22	94	93	62-133	0	30
Methylcyclohexane	20	18.45	20	18.43	92	92	67-121	0	30
Methylene Chloride	20	22.58	20	22.03	113	110	80-120	2	30
Styrene	20	21.08	20	20.76	105	104	80-120	2	30
1,1,2,2-Tetrachloroethane	20	21.56	20	21.62	108	108	72-120	0	30
Tetrachloroethene	20	21.08	20	21.05	105	105	80-120	0	30
Toluene	20	21.39	20	21.04	107	105	80-120	2	30
1,2,4-Trichlorobenzene	20	20.44	20	20.37	102	102	63-120	0	30
1,1,1-Trichloroethane	20	20.63	20	20.84	103	104	67-126	1	30
1,1,2-Trichloroethane	20	22.12	20	22.14	111	111	80-120	0	30
Trichloroethene	20	21.51	20	21.52	108	108	80-120	0	30
Trichlorofluoromethane	20	17.72	20	17.07	89	85	55-135	4	30
Vinyl Chloride	20	17.33	20	17.04	87	85	56-120	2	30
Xylene (Total)	60	63.54	60	62.69	106	104	80-120	1	30
Batch number: Y190642AA	Sample number(s): 9995311-9995318								
Acetone	150	154.86	150	159.67	103	106	54-157	3	30
Benzene	20	21.66	20	22.24	108	111	80-120	3	30
Bromodichloromethane	20	20.12	20	20.96	101	105	71-120	4	30
Bromoform	20	17.71	20	18.13	89	91	51-120	2	30
Bromomethane	20	15.23	20	15.89	76	79	53-128	4	30
2-Butanone	150	140.03	150	145.22	93	97	59-135	4	30
Carbon Disulfide	20	21	20	21.64	105	108	65-128	3	30
Carbon Tetrachloride	20	21.08	20	21.53	105	108	64-134	2	30
Chlorobenzene	20	21.38	20	22.08	107	110	80-120	3	30
Chloroethane	20	15.94	20	16.56	80	83	55-123	4	30
Chloroform	20	21.21	20	21.87	106	109	80-120	3	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: PES c/o Stantec
Reported: 03/08/2019 22:28

Group Number: 2031389

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Chloromethane	20	17.28	20	17.89	86	89	56-121	4	30
Cyclohexane	20	19.75	20	20.42	99	102	68-126	3	30
1,2-Dibromo-3-chloropropane	20	19.19	20	19.74	96	99	47-131	3	30
Dibromochloromethane	20	19.75	20	20.45	99	102	71-120	4	30
1,2-Dibromoethane	20	20.91	20	21.82	105	109	77-120	4	30
1,2-Dichlorobenzene	20	21.51	20	21.95	108	110	80-120	2	30
1,3-Dichlorobenzene	20	21.25	20	21.86	106	109	80-120	3	30
1,4-Dichlorobenzene	20	21.4	20	22.03	107	110	80-120	3	30
Dichlorodifluoromethane	20	14.65	20	15.19	73	76	41-127	4	30
1,1-Dichloroethane	20	20.83	20	21.44	104	107	80-120	3	30
1,2-Dichloroethane	20	20.19	20	20.63	101	103	73-124	2	30
1,1-Dichloroethene	20	23.31	20	24.29	117	121	80-131	4	30
cis-1,2-Dichloroethene	20	22.3	20	22.74	111	114	80-120	2	30
trans-1,2-Dichloroethene	20	22.57	20	23.3	113	116	80-120	3	30
1,2-Dichloropropane	20	21.72	20	22.63	109	113	80-120	4	30
cis-1,3-Dichloropropene	20	19.79	20	20.55	99	103	75-120	4	30
trans-1,3-Dichloropropene	20	19.22	20	19.88	96	99	67-120	3	30
Ethylbenzene	20	20.84	20	21.45	104	107	80-120	3	30
Freon 113	20	23.08	20	23.6	115	118	73-139	2	30
2-Hexanone	100	94.68	100	98.29	95	98	56-135	4	30
Isopropylbenzene	20	20.53	20	21.1	103	105	80-120	3	30
Methyl Acetate	20	19.36	20	20.4	97	102	54-136	5	30
Methyl Tertiary Butyl Ether	20	19.4	20	20.01	97	100	69-122	3	30
4-Methyl-2-pentanone	100	92.47	100	96.15	92	96	62-133	4	30
Methylcyclohexane	20	18.74	20	19.35	94	97	67-121	3	30
Methylene Chloride	20	22.38	20	23.1	112	115	80-120	3	30
Styrene	20	20.74	20	21.44	104	107	80-120	3	30
1,1,2,2-Tetrachloroethane	20	21.26	20	21.81	106	109	72-120	3	30
Tetrachloroethene	20	20.89	20	21.51	104	108	80-120	3	30
Toluene	20	21.12	20	21.73	106	109	80-120	3	30
1,2,4-Trichlorobenzene	20	20.07	20	20.5	100	102	63-120	2	30
1,1,1-Trichloroethane	20	20.56	20	21.28	103	106	67-126	3	30
1,1,2-Trichloroethane	20	22.35	20	23.12	112	116	80-120	3	30
Trichloroethene	20	21.59	20	22.1	108	111	80-120	2	30
Trichlorofluoromethane	20	17.68	20	17.94	88	90	55-135	2	30
Vinyl Chloride	20	17.56	20	18.08	88	90	56-120	3	30
Xylene (Total)	60	62.83	60	64.6	105	108	80-120	3	30
Batch number: Y190652AA	Sample number(s): 9995317								
Acetone	150	148.06	150	149.55	99	100	54-157	1	30
Bromodichloromethane	20	19.38	20	19.95	97	100	71-120	3	30
Bromoform	20	17.49	20	17.55	87	88	51-120	0	30
Bromomethane	20	14.59	20	14.95	73	75	53-128	2	30
2-Butanone	150	143.2	150	142.14	95	95	59-135	1	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: PES c/o Stantec
Reported: 03/08/2019 22:28

Group Number: 2031389

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Carbon Disulfide	20	21.05	20	21.25	105	106	65-128	1	30
Carbon Tetrachloride	20	21.18	20	20.54	106	103	64-134	3	30
Chlorobenzene	20	21.36	20	21.16	107	106	80-120	1	30
Chloroethane	20	15.9	20	15.43	80	77	55-123	3	30
Chloroform	20	21.56	20	20.87	108	104	80-120	3	30
Chloromethane	20	16.78	20	17.11	84	86	56-121	2	30
Cyclohexane	20	20.18	20	20.14	101	101	68-126	0	30
1,2-Dibromo-3-chloropropane	20	19.15	20	19.2	96	96	47-131	0	30
Dibromochloromethane	20	19.75	20	19.44	99	97	71-120	2	30
1,2-Dibromoethane	20	21.05	20	21.14	105	106	77-120	0	30
1,2-Dichlorobenzene	20	21.61	20	21.23	108	106	80-120	2	30
1,3-Dichlorobenzene	20	21.42	20	21.27	107	106	80-120	1	30
1,4-Dichlorobenzene	20	21.4	20	21.47	107	107	80-120	0	30
Dichlorodifluoromethane	20	13.45	20	14.31	67	72	41-127	6	30
1,1-Dichloroethane	20	21.06	20	20.93	105	105	80-120	1	30
1,2-Dichloroethane	20	21.01	20	19.77	105	99	73-124	6	30
1,1-Dichloroethene	20	23.88	20	24.01	119	120	80-131	1	30
cis-1,2-Dichloroethene	20	22.04	20	22.11	110	111	80-120	0	30
trans-1,2-Dichloroethene	20	22.47	20	22.37	112	112	80-120	0	30
1,2-Dichloropropane	20	22.28	20	21.82	111	109	80-120	2	30
cis-1,3-Dichloropropene	20	19.46	20	20.17	97	101	75-120	4	30
trans-1,3-Dichloropropene	20	19.32	20	19.34	97	97	67-120	0	30
Ethylbenzene	20	20.96	20	20.7	105	104	80-120	1	30
Freon 113	20	22.88	20	22.99	114	115	73-139	0	30
2-Hexanone	100	95.45	100	95.55	95	96	56-135	0	30
Isopropylbenzene	20	20.71	20	20.52	104	103	80-120	1	30
Methyl Acetate	20	19.83	20	19.73	99	99	54-136	1	30
Methyl Tertiary Butyl Ether	20	19.93	20	19.77	100	99	69-122	1	30
4-Methyl-2-pentanone	100	90.36	100	93.44	90	93	62-133	3	30
Methylcyclohexane	20	18.89	20	18.53	94	93	67-121	2	30
Methylene Chloride	20	22.33	20	22.11	112	111	80-120	1	30
Styrene	20	20.82	20	20.74	104	104	80-120	0	30
1,1,2,2-Tetrachloroethane	20	21.9	20	21.57	109	108	72-120	1	30
Tetrachloroethene	20	21.1	20	21.07	105	105	80-120	0	30
Toluene	20	21.26	20	21.14	106	106	80-120	1	30
1,2,4-Trichlorobenzene	20	20.52	20	20.21	103	101	63-120	2	30
1,1,1-Trichloroethane	20	21.07	20	20.35	105	102	67-126	3	30
1,1,2-Trichloroethane	20	22.12	20	22.09	111	110	80-120	0	30
Trichloroethene	20	21.68	20	21.54	108	108	80-120	1	30
Trichlorofluoromethane	20	16.74	20	16.86	84	84	55-135	1	30
Vinyl Chloride	20	17.1	20	17.3	85	87	56-120	1	30
Xylene (Total)	60	62.8	60	62.79	105	105	80-120	0	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: PES c/o Stantec
Reported: 03/08/2019 22:28

Group Number: 2031389

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: TCL (4.3) 8260 Water
Batch number: Y190641AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
9995319	109	114	103	97
9995320	110	115	103	96
Blank	106	112	104	100
LCS	105	110	106	106
LCSD	104	109	106	105
Limits:	80-120	80-120	80-120	80-120

Analysis Name: TCL (4.3) 8260 Water
Batch number: Y190642AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
9995311	102	108	108	106
9995312	101	107	118	109
9995313	103	110	102	105
9995314	105	111	101	105
9995315	101	107	112	104
9995316	103	110	103	104
9995318	101	105	111	104
Blank	108	113	103	97
LCS	105	107	106	106
LCSD	105	109	106	104
Limits:	80-120	80-120	80-120	80-120

Analysis Name: TCL (4.3) 8260 Water
Batch number: Y190652AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
9995317	104	110	102	95
Blank	105	111	103	99
LCS	105	109	106	106
LCSD	103	108	107	106
Limits:	80-120	80-120	80-120	80-120

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only
Acct. # 42093 Group # 203189 Sample # 99953/1-20

COC # 565908

Client Information

Client: Stantec
Acct. #: PES
Project Name/#: 213403039 PES Reformate Wells GWS
PWSID #:
Project Manager: Andrew Kilkybeil
P.O. #: 213403039
Sampler: Dave Hopkins
Quote #:
State where samples were collected: PA
For Compliance: Yes ☐ No ☐

Matrix

Soil ☐ Sediment ☐ Tissue ☐ | Water ☒ Potable ☐ Ground ☐ NPDES ☐ Surface ☐ | Other: Equipment Blank

Analysis Requested

Preservation and Filtration Codes

For Lab Use Only
FSC:
SCR#:

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 P=H_3PO_4
F=Field Filtered O=Other

Remarks

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	VOCs 8260
BF-99-20190227	2/27/19	1015	X		3	X
BF-106-20190227		1050	X		3	X
S-411-20190227		0841	X		3	X
S-784-20190227		0917	X		3	X
S-412-20190227		1123	X		3	X
S-383-20190227		1145	X		3	X
S-280-20190227		1255	X		3	X
S-428-20190227		1215	X		3	X
EB-20190227-1		1430	X		3	X
EB-20190227-2		1440	X		3	X

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days:

E-mail address: andrew.kilkybeil@stantec.com

Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP)
Type VI (Raw Data Only)
Type III (Reduced non-CLP) NJ DKQP TX TRRP-13
NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
Dave	2.28.19	11:21		2.28.19	1121
	2.28.19	1250			
			Marwan	2/28/19	12:50

EDD Required? Yes No
If yes, format: EQUIS

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS FedEx Other

Temperature upon receipt 1.1 °C

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Sample Administration Receipt Documentation Log

Doc Log ID: 242347

Group Number(s): 2031389

Client: Stantec

Delivery and Receipt Information

Delivery Method:	ELLE Courier	Arrival Timestamp:	02/28/2019 12:50
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	Pennsylvania		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	Yes	VOA Vial Headspace ≥ 6mm:	No
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	6
Samples Intact:	Yes	Trip Blank Type:	HCL
Missing Samples:	No	Air Quality Samples Present:	No
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Juan Carrion (16518) at 15:58 on 02/28/2019

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT42-03	1.1	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425
T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mL**	milliliter(s)
C	degrees Celsius	**MPN**	Most Probable Number
cfu	colony forming units	**N.D.**	non-detect
CP Units	cobalt-chloroplatinate units	**ng**	nanogram(s)
F	degrees Fahrenheit	**NTU**	nephelometric turbidity units
g	gram(s)	**pg/L**	picogram/liter
IU	International Units	**RL**	Reporting Limit
kg	kilogram(s)	**TNTC**	Too Numerous To Count
L	liter(s)	**µg**	microgram(s)
lb.	pound(s)	**µL**	microliter(s)
m3	cubic meter(s)	**umhos/cm**	micromhos/cm
meq	milliequivalents	**MCL**	Maximum Contamination Limit
mg	milligram(s)		

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

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Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value >= the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column >40%. The lower result is reported.
P^	Concentration difference between the primary and confirmation column > 40%. The higher result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report
B	Detection in the Blank
Q0	LCS/LCSD Low
Q1	LCS/LCSD High
Q2	MS/MSD Low
Q3	MS/MSD High
Q7	LCS/LCSD RPD
Q8	DUP RPD
Q9	MS/MSD RPD

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

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ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Tel: (717)656-2300

Laboratory Job ID: 410-12818-1
Client Project/Site: PES UDEX Release GW Sampling
Revision: 1

For:
Stantec Consulting Corp.
1060 Andrew Drive
Suite 140
West Chester, Pennsylvania 19380

Attn: Andrew Klingbeil

Authorized for release by:
3/11/2021 2:29:06 PM

Amek Carter, Project Manager
(717)556-7252
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LINKS

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The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

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Amek Carter
Project Manager
3/11/2021 2:29:06 PM

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Definitions/Glossary

Client: Stantec Consulting Corp. Job ID: 410-12818-1
Project/Site: PES UDEX Release GW Sampling

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
^c	CCV Recovery is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 410-12818-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Narrative

Job Narrative
410-12818-1

Revision
The report being provided is a revision of the original report sent on 9/9/2020. The report (revision 1) is being revised due to: Sample ID Correction - Correct sample ID for C-129D_20200902.

Receipt
The samples were received on 9/2/2020 4:15 PM; the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 5.5°C

Receipt Exceptions
The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): S-129D_20200902 (410-12818-4). The COC lists a collection time of 12:28. The container labels list a collection time of 10:28.

GC/MS VOA
Method 8260C: The continuing calibration verification (CCV) associated with batch 410-41794 recovered above the upper control limit for Acetone. Any detections are considered estimated.

Method 8260C: The continuing calibration verification (CCV) associated with batch 410-41794 recovered outside acceptance criteria, low biased, for Chloromethane, Ethyl ether, trans-1,4-Dichloro-2-butene and Vinyl chloride. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Any detections are considered estimated

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: Stantec Consulting Corp.
Project/Site: PES UDEX Release GW Sampling

Job ID: 410-12818-1

Client Sample ID: S-280D_20200901 — Lab Sample ID: 410-12818-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Methyl tertiary butyl ether	0.23	J	1.0	0.20	ug/L	1		8260C	Total/NA

Client Sample ID: S-284D_20200901 — Lab Sample ID: 410-12818-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	2.3	J ^c	20	0.70	ug/L	1		8260C	Total/NA

Client Sample ID: S-69D_20200901 — Lab Sample ID: 410-12818-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Methyl tertiary butyl ether	1.7		1.0	0.20	ug/L	1		8260C	Total/NA

Client Sample ID: C-129D_20200902 — Lab Sample ID: 410-12818-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	11	J ^c	20	0.70	ug/L	1		8260C	Total/NA
2-Butanone	0.93	J	10	0.30	ug/L	1		8260C	Total/NA

Client Sample ID: Trip Blank — Lab Sample ID: 410-12818-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	1.3	J ^c	20	0.70	ug/L	1		8260C	Total/NA

Client Sample ID: Field Blank — Lab Sample ID: 410-12818-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	1.3	J ^c	20	0.70	ug/L	1		8260C	Total/NA

Client Sample ID: Equipment Blank — Lab Sample ID: 410-12818-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	1.0	J ^c	20	0.70	ug/L	1		8260C	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Stantec Consulting Corp.
Project/Site: PES UDEX Release GW Sampling

Job ID: 410-12818-1

Client Sample ID: S-280D_20200901
Date Collected: 09/01/20 12:55
Date Received: 09/02/20 16:15

Lab Sample ID: 410-12818-1
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/09/20 07:04	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/09/20 07:04	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/09/20 07:04	1
Styrene	ND		5.0	0.20	ug/L			09/09/20 07:04	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/09/20 07:04	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/09/20 07:04	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/09/20 07:04	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/09/20 07:04	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/09/20 07:04	1
Toluene	ND		1.0	0.20	ug/L			09/09/20 07:04	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/09/20 07:04	1
Cyclohexane	ND		5.0	1.0	ug/L			09/09/20 07:04	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/09/20 07:04	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/09/20 07:04	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/09/20 07:04	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/09/20 07:04	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/09/20 07:04	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/09/20 07:04	1
Methyl tertiary butyl ether	**0.23**	**J**	1.0	0.20	ug/L			09/09/20 07:04	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/09/20 07:04	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/09/20 07:04	1
2-Hexanone	ND		10	0.30	ug/L			09/09/20 07:04	1
Acetone	ND	^c	20	0.70	ug/L			09/09/20 07:04	1
Chloroform	ND		1.0	0.20	ug/L			09/09/20 07:04	1
Benzene	ND		1.0	0.20	ug/L			09/09/20 07:04	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/09/20 07:04	1
Bromomethane	ND		1.0	0.30	ug/L			09/09/20 07:04	1
Chloromethane	ND	^c	1.0	0.20	ug/L			09/09/20 07:04	1
Chloroethane	ND		1.0	0.20	ug/L			09/09/20 07:04	1
Vinyl chloride	ND	^c	1.0	0.20	ug/L			09/09/20 07:04	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/09/20 07:04	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/09/20 07:04	1
Bromoform	ND		4.0	1.0	ug/L			09/09/20 07:04	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/09/20 07:04	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/09/20 07:04	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/09/20 07:04	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/09/20 07:04	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/09/20 07:04	1
Freon 113	ND		10	0.20	ug/L			09/09/20 07:04	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/09/20 07:04	1
2-Butanone	ND		10	0.30	ug/L			09/09/20 07:04	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/09/20 07:04	1
Trichloroethene	ND		1.0	0.20	ug/L			09/09/20 07:04	1
Methyl acetate	ND		5.0	0.30	ug/L			09/09/20 07:04	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/09/20 07:04	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/09/20 07:04	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/09/20 07:04	1
Isopropylbenzene	ND		5.0	0.20	ug/L			09/09/20 07:04	1

Client Sample ID: S-280D_20200901 — Lab Sample ID: 410-12818-1

Date Collected: 09/01/20 12:55 — **Matrix: Water**
Date Received: 09/02/20 16:15

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*104*		*80 - 120*		*09/09/20 07:04*	*1*
Dibromofluoromethane (Surr)	*102*		*80 - 120*		*09/09/20 07:04*	*1*
4-Bromofluorobenzene (Surr)	*89*		*80 - 120*		*09/09/20 07:04*	*1*
Toluene-d8 (Surr)	*99*		*80 - 120*		*09/09/20 07:04*	*1*

Client Sample ID: S-284D_20200901 — Lab Sample ID: 410-12818-2

Date Collected: 09/01/20 14:40 — **Matrix: Water**
Date Received: 09/02/20 16:15

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/09/20 07:26	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/09/20 07:26	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/09/20 07:26	1
Styrene	ND		5.0	0.20	ug/L			09/09/20 07:26	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/09/20 07:26	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/09/20 07:26	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/09/20 07:26	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/09/20 07:26	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/09/20 07:26	1
Toluene	ND		1.0	0.20	ug/L			09/09/20 07:26	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/09/20 07:26	1
Cyclohexane	ND		5.0	1.0	ug/L			09/09/20 07:26	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/09/20 07:26	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/09/20 07:26	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/09/20 07:26	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/09/20 07:26	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/09/20 07:26	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/09/20 07:26	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/09/20 07:26	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/09/20 07:26	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/09/20 07:26	1
2-Hexanone	ND		10	0.30	ug/L			09/09/20 07:26	1
Acetone	**2.3**	**J ^c**	20	0.70	ug/L			09/09/20 07:26	1
Chloroform	ND		1.0	0.20	ug/L			09/09/20 07:26	1
Benzene	ND		1.0	0.20	ug/L			09/09/20 07:26	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/09/20 07:26	1
Bromomethane	ND		1.0	0.30	ug/L			09/09/20 07:26	1
Chloromethane	ND	^c	1.0	0.20	ug/L			09/09/20 07:26	1
Chloroethane	ND		1.0	0.20	ug/L			09/09/20 07:26	1
Vinyl chloride	ND	^c	1.0	0.20	ug/L			09/09/20 07:26	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/09/20 07:26	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/09/20 07:26	1
Bromoform	ND		4.0	1.0	ug/L			09/09/20 07:26	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/09/20 07:26	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/09/20 07:26	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/09/20 07:26	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/09/20 07:26	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/09/20 07:26	1
Freon 113	ND		10	0.20	ug/L			09/09/20 07:26	1

Client Sample ID: S-284D_20200901
Lab Sample ID: 410-12818-2
Date Collected: 09/01/20 14:40
Matrix: Water
Date Received: 09/02/20 16:15

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/09/20 07:26	1
2-Butanone	ND		10	0.30	ug/L			09/09/20 07:26	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/09/20 07:26	1
Trichloroethene	ND		1.0	0.20	ug/L			09/09/20 07:26	1
Methyl acetate	ND		5.0	0.30	ug/L			09/09/20 07:26	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/09/20 07:26	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/09/20 07:26	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/09/20 07:26	1
Isopropylbenzene	ND		5.0	0.20	ug/L			09/09/20 07:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*80 - 120*		*09/09/20 07:26*	*1*
Dibromofluoromethane (Surr)	*105*		*80 - 120*		*09/09/20 07:26*	*1*
4-Bromofluorobenzene (Surr)	*89*		*80 - 120*		*09/09/20 07:26*	*1*
Toluene-d8 (Surr)	*99*		*80 - 120*		*09/09/20 07:26*	*1*

Client Sample ID: S-69D_20200901
Lab Sample ID: 410-12818-3
Date Collected: 09/01/20 16:05
Matrix: Water
Date Received: 09/02/20 16:15

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/09/20 07:48	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/09/20 07:48	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/09/20 07:48	1
Styrene	ND		5.0	0.20	ug/L			09/09/20 07:48	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/09/20 07:48	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/09/20 07:48	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/09/20 07:48	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/09/20 07:48	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/09/20 07:48	1
Toluene	ND		1.0	0.20	ug/L			09/09/20 07:48	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/09/20 07:48	1
Cyclohexane	ND		5.0	1.0	ug/L			09/09/20 07:48	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/09/20 07:48	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/09/20 07:48	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/09/20 07:48	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/09/20 07:48	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/09/20 07:48	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/09/20 07:48	1
Methyl tertiary butyl ether	**1.7**		1.0	0.20	ug/L			09/09/20 07:48	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/09/20 07:48	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/09/20 07:48	1
2-Hexanone	ND		10	0.30	ug/L			09/09/20 07:48	1
Acetone	ND	^c	20	0.70	ug/L			09/09/20 07:48	1
Chloroform	ND		1.0	0.20	ug/L			09/09/20 07:48	1
Benzene	ND		1.0	0.20	ug/L			09/09/20 07:48	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/09/20 07:48	1
Bromomethane	ND		1.0	0.30	ug/L			09/09/20 07:48	1
Chloromethane	ND	^c	1.0	0.20	ug/L			09/09/20 07:48	1

Client Sample ID: S-69D_20200901
Lab Sample ID: 410-12818-3
Date Collected: 09/01/20 16:05
Matrix: Water
Date Received: 09/02/20 16:15

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		1.0	0.20	ug/L			09/09/20 07:48	1
Vinyl chloride	ND	^c	1.0	0.20	ug/L			09/09/20 07:48	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/09/20 07:48	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/09/20 07:48	1
Bromoform	ND		4.0	1.0	ug/L			09/09/20 07:48	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/09/20 07:48	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/09/20 07:48	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/09/20 07:48	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/09/20 07:48	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/09/20 07:48	1
Freon 113	ND		10	0.20	ug/L			09/09/20 07:48	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/09/20 07:48	1
2-Butanone	ND		10	0.30	ug/L			09/09/20 07:48	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/09/20 07:48	1
Trichloroethene	ND		1.0	0.20	ug/L			09/09/20 07:48	1
Methyl acetate	ND		5.0	0.30	ug/L			09/09/20 07:48	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/09/20 07:48	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/09/20 07:48	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/09/20 07:48	1
Isopropylbenzene	ND		5.0	0.20	ug/L			09/09/20 07:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*80 - 120*		*09/09/20 07:48*	*1*
Dibromofluoromethane (Surr)	*105*		*80 - 120*		*09/09/20 07:48*	*1*
4-Bromofluorobenzene (Surr)	*88*		*80 - 120*		*09/09/20 07:48*	*1*
Toluene-d8 (Surr)	*99*		*80 - 120*		*09/09/20 07:48*	*1*

Client Sample ID: C-129D_20200902
Lab Sample ID: 410-12818-4
Date Collected: 09/02/20 12:28
Matrix: Water
Date Received: 09/02/20 16:15

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/09/20 08:10	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/09/20 08:10	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/09/20 08:10	1
Styrene	ND		5.0	0.20	ug/L			09/09/20 08:10	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/09/20 08:10	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/09/20 08:10	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/09/20 08:10	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/09/20 08:10	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/09/20 08:10	1
Toluene	ND		1.0	0.20	ug/L			09/09/20 08:10	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/09/20 08:10	1
Cyclohexane	ND		5.0	1.0	ug/L			09/09/20 08:10	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/09/20 08:10	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/09/20 08:10	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/09/20 08:10	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/09/20 08:10	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/09/20 08:10	1

Client Sample ID: C-129D_20200902

Lab Sample ID: 410-12818-4

Date Collected: 09/02/20 12:28
Matrix: Water
Date Received: 09/02/20 16:15

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/09/20 08:10	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/09/20 08:10	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/09/20 08:10	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/09/20 08:10	1
2-Hexanone	ND		10	0.30	ug/L			09/09/20 08:10	1
Acetone	**11**	**J ^c**	20	0.70	ug/L			09/09/20 08:10	1
Chloroform	ND		1.0	0.20	ug/L			09/09/20 08:10	1
Benzene	ND		1.0	0.20	ug/L			09/09/20 08:10	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/09/20 08:10	1
Bromomethane	ND		1.0	0.30	ug/L			09/09/20 08:10	1
Chloromethane	ND	^c	1.0	0.20	ug/L			09/09/20 08:10	1
Chloroethane	ND		1.0	0.20	ug/L			09/09/20 08:10	1
Vinyl chloride	ND	^c	1.0	0.20	ug/L			09/09/20 08:10	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/09/20 08:10	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/09/20 08:10	1
Bromoform	ND		4.0	1.0	ug/L			09/09/20 08:10	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/09/20 08:10	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/09/20 08:10	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/09/20 08:10	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/09/20 08:10	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/09/20 08:10	1
Freon 113	ND		10	0.20	ug/L			09/09/20 08:10	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/09/20 08:10	1
2-Butanone	**0.93**	**J**	10	0.30	ug/L			09/09/20 08:10	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/09/20 08:10	1
Trichloroethene	ND		1.0	0.20	ug/L			09/09/20 08:10	1
Methyl acetate	ND		5.0	0.30	ug/L			09/09/20 08:10	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/09/20 08:10	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/09/20 08:10	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/09/20 08:10	1
Isopropylbenzene	ND		5.0	0.20	ug/L			09/09/20 08:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*80 - 120*		*09/09/20 08:10*	*1*
Dibromofluoromethane (Surr)	*103*		*80 - 120*		*09/09/20 08:10*	*1*
4-Bromofluorobenzene (Surr)	*89*		*80 - 120*		*09/09/20 08:10*	*1*
Toluene-d8 (Surr)	*102*		*80 - 120*		*09/09/20 08:10*	*1*

Client Sample ID: Trip Blank

Lab Sample ID: 410-12818-5

Date Collected: 09/01/20 00:00
Matrix: Water
Date Received: 09/02/20 16:15

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/09/20 02:17	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/09/20 02:17	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/09/20 02:17	1
Styrene	ND		5.0	0.20	ug/L			09/09/20 02:17	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/09/20 02:17	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/09/20 02:17	1

Client: Stantec Consulting Corp.
Project/Site: PES UDEX Release GW Sampling

Job ID: 410-12818-1

Client Sample ID: Trip Blank

Date Collected: 09/01/20 00:00
Date Received: 09/02/20 16:15

Lab Sample ID: 410-12818-5

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/09/20 02:17	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/09/20 02:17	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/09/20 02:17	1
Toluene	ND		1.0	0.20	ug/L			09/09/20 02:17	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/09/20 02:17	1
Cyclohexane	ND		5.0	1.0	ug/L			09/09/20 02:17	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/09/20 02:17	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/09/20 02:17	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/09/20 02:17	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/09/20 02:17	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/09/20 02:17	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/09/20 02:17	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/09/20 02:17	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/09/20 02:17	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/09/20 02:17	1
2-Hexanone	ND		10	0.30	ug/L			09/09/20 02:17	1
Acetone	**1.3**	**J ^c**	20	0.70	ug/L			09/09/20 02:17	1
Chloroform	ND		1.0	0.20	ug/L			09/09/20 02:17	1
Benzene	ND		1.0	0.20	ug/L			09/09/20 02:17	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/09/20 02:17	1
Bromomethane	ND		1.0	0.30	ug/L			09/09/20 02:17	1
Chloromethane	ND	^c	1.0	0.20	ug/L			09/09/20 02:17	1
Chloroethane	ND		1.0	0.20	ug/L			09/09/20 02:17	1
Vinyl chloride	ND	^c	1.0	0.20	ug/L			09/09/20 02:17	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/09/20 02:17	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/09/20 02:17	1
Bromoform	ND		4.0	1.0	ug/L			09/09/20 02:17	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/09/20 02:17	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/09/20 02:17	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/09/20 02:17	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/09/20 02:17	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/09/20 02:17	1
Freon 113	ND		10	0.20	ug/L			09/09/20 02:17	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/09/20 02:17	1
2-Butanone	ND		10	0.30	ug/L			09/09/20 02:17	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/09/20 02:17	1
Trichloroethene	ND		1.0	0.20	ug/L			09/09/20 02:17	1
Methyl acetate	ND		5.0	0.30	ug/L			09/09/20 02:17	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/09/20 02:17	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/09/20 02:17	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/09/20 02:17	1
Isopropylbenzene	ND		5.0	0.20	ug/L			09/09/20 02:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*80 - 120*		*09/09/20 02:17*	*1*
Dibromofluoromethane (Surr)	*103*		*80 - 120*		*09/09/20 02:17*	*1*
4-Bromofluorobenzene (Surr)	*89*		*80 - 120*		*09/09/20 02:17*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*09/09/20 02:17*	*1*

Client: Stantec Consulting Corp.
Project/Site: PES UDEX Release GW Sampling

Job ID: 410-12818-1

Client Sample ID: Field Blank

Date Collected: 09/02/20 12:30
Date Received: 09/02/20 16:15

Lab Sample ID: 410-12818-6

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/09/20 02:40	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/09/20 02:40	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/09/20 02:40	1
Styrene	ND		5.0	0.20	ug/L			09/09/20 02:40	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/09/20 02:40	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/09/20 02:40	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/09/20 02:40	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/09/20 02:40	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/09/20 02:40	1
Toluene	ND		1.0	0.20	ug/L			09/09/20 02:40	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/09/20 02:40	1
Cyclohexane	ND		5.0	1.0	ug/L			09/09/20 02:40	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/09/20 02:40	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/09/20 02:40	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/09/20 02:40	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/09/20 02:40	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/09/20 02:40	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/09/20 02:40	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/09/20 02:40	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/09/20 02:40	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/09/20 02:40	1
2-Hexanone	ND		10	0.30	ug/L			09/09/20 02:40	1
Acetone	**1.3**	**J ^c**	20	0.70	ug/L			09/09/20 02:40	1
Chloroform	ND		1.0	0.20	ug/L			09/09/20 02:40	1
Benzene	ND		1.0	0.20	ug/L			09/09/20 02:40	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/09/20 02:40	1
Bromomethane	ND		1.0	0.30	ug/L			09/09/20 02:40	1
Chloromethane	ND	^c	1.0	0.20	ug/L			09/09/20 02:40	1
Chloroethane	ND		1.0	0.20	ug/L			09/09/20 02:40	1
Vinyl chloride	ND	^c	1.0	0.20	ug/L			09/09/20 02:40	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/09/20 02:40	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/09/20 02:40	1
Bromoform	ND		4.0	1.0	ug/L			09/09/20 02:40	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/09/20 02:40	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/09/20 02:40	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/09/20 02:40	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/09/20 02:40	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/09/20 02:40	1
Freon 113	ND		10	0.20	ug/L			09/09/20 02:40	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/09/20 02:40	1
2-Butanone	ND		10	0.30	ug/L			09/09/20 02:40	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/09/20 02:40	1
Trichloroethene	ND		1.0	0.20	ug/L			09/09/20 02:40	1
Methyl acetate	ND		5.0	0.30	ug/L			09/09/20 02:40	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/09/20 02:40	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/09/20 02:40	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/09/20 02:40	1
Isopropylbenzene	ND		5.0	0.20	ug/L			09/09/20 02:40	1

Client Sample ID: Field Blank
Lab Sample ID: 410-12818-6

Date Collected: 09/02/20 12:30
Matrix: Water
Date Received: 09/02/20 16:15

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*80 - 120*		*09/09/20 02:40*	*1*
Dibromofluoromethane (Surr)	*103*		*80 - 120*		*09/09/20 02:40*	*1*
4-Bromofluorobenzene (Surr)	*88*		*80 - 120*		*09/09/20 02:40*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*09/09/20 02:40*	*1*

Client Sample ID: Equipment Blank
Lab Sample ID: 410-12818-7

Date Collected: 09/02/20 12:35
Matrix: Water
Date Received: 09/02/20 16:15

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/09/20 03:02	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/09/20 03:02	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/09/20 03:02	1
Styrene	ND		5.0	0.20	ug/L			09/09/20 03:02	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/09/20 03:02	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/09/20 03:02	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/09/20 03:02	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/09/20 03:02	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/09/20 03:02	1
Toluene	ND		1.0	0.20	ug/L			09/09/20 03:02	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/09/20 03:02	1
Cyclohexane	ND		5.0	1.0	ug/L			09/09/20 03:02	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/09/20 03:02	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/09/20 03:02	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/09/20 03:02	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/09/20 03:02	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/09/20 03:02	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/09/20 03:02	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/09/20 03:02	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/09/20 03:02	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/09/20 03:02	1
2-Hexanone	ND		10	0.30	ug/L			09/09/20 03:02	1
Acetone	**1.0**	**J ^c**	20	0.70	ug/L			09/09/20 03:02	1
Chloroform	ND		1.0	0.20	ug/L			09/09/20 03:02	1
Benzene	ND		1.0	0.20	ug/L			09/09/20 03:02	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/09/20 03:02	1
Bromomethane	ND		1.0	0.30	ug/L			09/09/20 03:02	1
Chloromethane	ND	^c	1.0	0.20	ug/L			09/09/20 03:02	1
Chloroethane	ND		1.0	0.20	ug/L			09/09/20 03:02	1
Vinyl chloride	ND	^c	1.0	0.20	ug/L			09/09/20 03:02	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/09/20 03:02	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/09/20 03:02	1
Bromoform	ND		4.0	1.0	ug/L			09/09/20 03:02	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/09/20 03:02	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/09/20 03:02	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/09/20 03:02	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/09/20 03:02	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/09/20 03:02	1
Freon 113	ND		10	0.20	ug/L			09/09/20 03:02	1

Client: Stantec Consulting Corp.
Job ID: 410-12818-1
Project/Site: PES UDEX Release GW Sampling

Client Sample ID: Equipment Blank
Lab Sample ID: 410-12818-7
Date Collected: 09/02/20 12:35
Matrix: Water
Date Received: 09/02/20 16:15

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/09/20 03:02	1
2-Butanone	ND		10	0.30	ug/L			09/09/20 03:02	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/09/20 03:02	1
Trichloroethene	ND		1.0	0.20	ug/L			09/09/20 03:02	1
Methyl acetate	ND		5.0	0.30	ug/L			09/09/20 03:02	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/09/20 03:02	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/09/20 03:02	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/09/20 03:02	1
Isopropylbenzene	ND		5.0	0.20	ug/L			09/09/20 03:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*80 - 120*		*09/09/20 03:02*	*1*
Dibromofluoromethane (Surr)	*104*		*80 - 120*		*09/09/20 03:02*	*1*
4-Bromofluorobenzene (Surr)	*88*		*80 - 120*		*09/09/20 03:02*	*1*
Toluene-d8 (Surr)	*99*		*80 - 120*		*09/09/20 03:02*	*1*

Surrogate Summary

Client: Stantec Consulting Corp.
Project/Site: PES UDEX Release GW Sampling

Job ID: 410-12818-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	DBFM	BFB	TOL
Lab Sample ID	Client Sample ID	(80-120)	(80-120)	(80-120)	(80-120)
410-12818-1	S-280D_20200901	104	102	89	99
410-12818-2	S-284D_20200901	106	105	89	99
410-12818-3	S-69D_20200901	107	105	88	99
410-12818-4	C-129D_20200902	104	103	89	102
410-12818-5	Trip Blank	104	103	89	98
410-12818-6	Field Blank	105	103	88	98
410-12818-7	Equipment Blank	106	104	88	99
LCS 410-41794/4	Lab Control Sample	100	97	100	100
MB 410-41794/6	Method Blank	106	105	89	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
DBFM = Dibromofluoromethane (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)

Client: Stantec Consulting Corp.
Project/Site: PES UDEX Release GW Sampling

Job ID: 410-12818-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 410-41794/6
Matrix: Water
Analysis Batch: 41794

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/08/20 22:27	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/08/20 22:27	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/08/20 22:27	1
Styrene	ND		5.0	0.20	ug/L			09/08/20 22:27	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/08/20 22:27	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/08/20 22:27	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/08/20 22:27	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/08/20 22:27	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/08/20 22:27	1
Toluene	ND		1.0	0.20	ug/L			09/08/20 22:27	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/08/20 22:27	1
Cyclohexane	ND		5.0	1.0	ug/L			09/08/20 22:27	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/08/20 22:27	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/08/20 22:27	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/08/20 22:27	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/08/20 22:27	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/08/20 22:27	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/08/20 22:27	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/08/20 22:27	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/08/20 22:27	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/08/20 22:27	1
2-Hexanone	ND		10	0.30	ug/L			09/08/20 22:27	1
Acetone	ND		20	0.70	ug/L			09/08/20 22:27	1
Chloroform	ND		1.0	0.20	ug/L			09/08/20 22:27	1
Benzene	ND		1.0	0.20	ug/L			09/08/20 22:27	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/08/20 22:27	1
Bromomethane	ND		1.0	0.30	ug/L			09/08/20 22:27	1
Chloromethane	ND		1.0	0.20	ug/L			09/08/20 22:27	1
Chloroethane	ND		1.0	0.20	ug/L			09/08/20 22:27	1
Vinyl chloride	ND		1.0	0.20	ug/L			09/08/20 22:27	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/08/20 22:27	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/08/20 22:27	1
Bromoform	ND		4.0	1.0	ug/L			09/08/20 22:27	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/08/20 22:27	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/08/20 22:27	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/08/20 22:27	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/08/20 22:27	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/08/20 22:27	1
Freon 113	ND		10	0.20	ug/L			09/08/20 22:27	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/08/20 22:27	1
2-Butanone	ND		10	0.30	ug/L			09/08/20 22:27	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/08/20 22:27	1
Trichloroethene	ND		1.0	0.20	ug/L			09/08/20 22:27	1
Methyl acetate	ND		5.0	0.30	ug/L			09/08/20 22:27	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/08/20 22:27	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/08/20 22:27	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/08/20 22:27	1
Isopropylbenzene	ND		5.0	0.20	ug/L			09/08/20 22:27	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-41794/6
Matrix: Water
Analysis Batch: 41794

Client Sample ID: Method Blank
Prep Type: Total/NA

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*106*		*80 - 120*		*09/08/20 22:27*	*1*
Dibromofluoromethane (Surr)	*105*		*80 - 120*		*09/08/20 22:27*	*1*
4-Bromofluorobenzene (Surr)	*89*		*80 - 120*		*09/08/20 22:27*	*1*
Toluene-d8 (Surr)	*99*		*80 - 120*		*09/08/20 22:27*	*1*

Lab Sample ID: LCS 410-41794/4
Matrix: Water
Analysis Batch: 41794

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,3-Dichloropropene	20.0	19.6		ug/L		98	75 - 120
trans-1,3-Dichloropropene	20.0	19.4		ug/L		97	67 - 120
Ethylbenzene	20.0	20.9		ug/L		104	80 - 120
Styrene	20.0	20.7		ug/L		104	80 - 120
1,4-Dichlorobenzene	20.0	21.0		ug/L		105	80 - 120
1,2-Dibromoethane	20.0	21.0		ug/L		105	77 - 120
1,2-Dichloroethane	20.0	20.0		ug/L		100	73 - 124
4-Methyl-2-pentanone	100	92.3		ug/L		92	62 - 133
Methylcyclohexane	20.0	18.0		ug/L		90	67 - 121
Toluene	20.0	21.7		ug/L		109	80 - 120
Chlorobenzene	20.0	22.2		ug/L		111	80 - 120
Cyclohexane	20.0	19.2		ug/L		96	68 - 126
1,2,4-Trichlorobenzene	20.0	18.2		ug/L		91	63 - 120
Dibromochloromethane	20.0	22.4		ug/L		112	71 - 120
Xylenes, Total	60.0	62.4		ug/L		104	80 - 120
Tetrachloroethene	20.0	19.2		ug/L		96	80 - 120
cis-1,2-Dichloroethene	20.0	22.3		ug/L		112	80 - 125
trans-1,2-Dichloroethene	20.0	22.0		ug/L		110	80 - 126
Methyl tertiary butyl ether	20.0	17.1		ug/L		86	69 - 122
1,3-Dichlorobenzene	20.0	20.7		ug/L		104	80 - 120
Carbon tetrachloride	20.0	21.5		ug/L		107	64 - 134
2-Hexanone	100	94.6		ug/L		95	56 - 135
Acetone	150	192		ug/L		128	54 - 157
Chloroform	20.0	21.4		ug/L		107	80 - 120
Benzene	20.0	21.7		ug/L		108	80 - 120
1,1,1-Trichloroethane	20.0	20.8		ug/L		104	67 - 126
Bromomethane	20.0	16.6		ug/L		83	53 - 128
Chloromethane	20.0	14.4		ug/L		72	56 - 121
Chloroethane	20.0	16.4		ug/L		82	55 - 123
Vinyl chloride	20.0	15.1		ug/L		76	56 - 120
Methylene Chloride	20.0	22.0		ug/L		110	80 - 120
Carbon disulfide	20.0	23.5		ug/L		118	65 - 128
Bromoform	20.0	20.2		ug/L		101	51 - 120
Bromodichloromethane	20.0	21.2		ug/L		106	71 - 120
1,1-Dichloroethane	20.0	20.8		ug/L		104	80 - 120
1,1-Dichloroethene	20.0	22.7		ug/L		113	80 - 131
Trichlorofluoromethane	20.0	17.4		ug/L		87	55 - 135
Dichlorodifluoromethane	20.0	12.7		ug/L		63	41 - 127

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-41794/4
Matrix: Water
Analysis Batch: 41794

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Freon 113	20.0	21.3		ug/L		106	73 - 139
1,2-Dichloropropane	20.0	21.3		ug/L		106	80 - 120
2-Butanone	150	141		ug/L		94	59 - 135
1,1,2-Trichloroethane	20.0	22.9		ug/L		115	80 - 120
Trichloroethene	20.0	21.1		ug/L		105	80 - 120
Methyl acetate	20.0	17.7		ug/L		88	54 - 136
1,1,2,2-Tetrachloroethane	20.0	21.5		ug/L		107	72 - 120
1,2-Dichlorobenzene	20.0	21.2		ug/L		106	80 - 120
1,2-Dibromo-3-Chloropropane	20.0	19.4		ug/L		97	47 - 131
Isopropylbenzene	20.0	20.0		ug/L		100	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 120*
Dibromofluoromethane (Surr)	*97*		*80 - 120*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*
Toluene-d8 (Surr)	*100*		*80 - 120*

QC Association Summary

Client: Stantec Consulting Corp.
Project/Site: PES UDEX Release GW Sampling

Job ID: 410-12818-1

GC/MS VOA

Analysis Batch: 41794

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-12818-1	S-280D_20200901	Total/NA	Water	8260C	
410-12818-2	S-284D_20200901	Total/NA	Water	8260C	
410-12818-3	S-69D_20200901	Total/NA	Water	8260C	
410-12818-4	C-129D_20200902	Total/NA	Water	8260C	
410-12818-5	Trip Blank	Total/NA	Water	8260C	
410-12818-6	Field Blank	Total/NA	Water	8260C	
410-12818-7	Equipment Blank	Total/NA	Water	8260C	
MB 410-41794/6	Method Blank	Total/NA	Water	8260C	
LCS 410-41794/4	Lab Control Sample	Total/NA	Water	8260C	

Lab Chronicle

Client: Stantec Consulting Corp.
Project/Site: PES UDEX Release GW Sampling

Job ID: 410-12818-1

Client Sample ID: S-280D_20200901
Lab Sample ID: 410-12818-1
Date Collected: 09/01/20 12:55
Matrix: Water
Date Received: 09/02/20 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	41794	09/09/20 07:04	TQ4J	ELLE

Client Sample ID: S-284D_20200901
Lab Sample ID: 410-12818-2
Date Collected: 09/01/20 14:40
Matrix: Water
Date Received: 09/02/20 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	41794	09/09/20 07:26	TQ4J	ELLE

Client Sample ID: S-69D_20200901
Lab Sample ID: 410-12818-3
Date Collected: 09/01/20 16:05
Matrix: Water
Date Received: 09/02/20 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	41794	09/09/20 07:48	TQ4J	ELLE

Client Sample ID: C-129D_20200902
Lab Sample ID: 410-12818-4
Date Collected: 09/02/20 12:28
Matrix: Water
Date Received: 09/02/20 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	41794	09/09/20 08:10	TQ4J	ELLE

Client Sample ID: Trip Blank
Lab Sample ID: 410-12818-5
Date Collected: 09/01/20 00:00
Matrix: Water
Date Received: 09/02/20 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	41794	09/09/20 02:17	TQ4J	ELLE

Client Sample ID: Field Blank
Lab Sample ID: 410-12818-6
Date Collected: 09/02/20 12:30
Matrix: Water
Date Received: 09/02/20 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	41794	09/09/20 02:40	TQ4J	ELLE

Client Sample ID: Equipment Blank
Lab Sample ID: 410-12818-7
Date Collected: 09/02/20 12:35
Matrix: Water
Date Received: 09/02/20 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	41794	09/09/20 03:02	TQ4J	ELLE

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Stantec Consulting Corp. Job ID: 410-12818-1
Project/Site: PES UDEX Release GW Sampling

Laboratory: Eurofins Lancaster Laboratories Env, LLC

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Pennsylvania	NELAP	36-00037	11-02-20

Method Summary

Client: Stantec Consulting Corp.
Project/Site: PES UDEX Release GW Sampling

Job ID: 410-12818-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	ELLE
5030C	Purge and Trap	SW846	ELLE

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: Stantec Consulting Corp.
Project/Site: PES UDEX Release GW Sampling

Job ID: 410-12818-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
410-12818-1	S-280D_20200901	Water	09/01/20 12:55	09/02/20 16:15	
410-12818-2	S-284D_20200901	Water	09/01/20 14:40	09/02/20 16:15	
410-12818-3	S-69D_20200901	Water	09/01/20 16:05	09/02/20 16:15	
410-12818-4	C-129D_20200902	Water	09/02/20 12:28	09/02/20 16:15	
410-12818-5	Trip Blank	Water	09/01/20 00:00	09/02/20 16:15	
410-12818-6	Field Blank	Water	09/02/20 12:30	09/02/20 16:15	
410-12818-7	Equipment Blank	Water	09/02/20 12:35	09/02/20 16:15	

Environmental Analysis Custody

eurofins | Lancaster Laboratories Environmental

Acct. # _____

410-12818 Chain of Custody

ıental use only

COC #612316

Client Information

Client: Stantec Consulting	Acct. #:
Project Name/#: PES UDEX	PWSID #:
Project Manager: Jennifer Mengcs	P.O. #: 2134803039
Sampler: Jim Craft	Quote #:
State where samples were collected: PA	For Compliance: Yes ☐ No ☐

For Lab Use Only
FSC: _____
SCR#: 262940

Sample Identification	Collected Date	Collected Time	Grab	Composite	Matrix: Soil	Sediment	Tissue	Water	Potable	Ground	NPDES	Surface	Other:	Total # of Containers	Analysis Requested: VOC 8260 C	H
S-28D-20200901	9/1/2020	1255	X					X						3	X	
S-28D-20200901	9/1/2020	1440	X					X						3	X	
S-69D-20200901	9/1/2020	1605	X					X						3	X	
S-129D-20200902	9/2/2020	1228	X					X						3	X	
Trip Blank	9/1/20		X					X						1	X	
Field Blank	9/2/20	1230	X					X						3	X	
Equipment Blank	9/2/2020	1235	X					X						3	X	

Preservation Codes

H=HCl	T=Thiosulfate
N=HNO_3	B=NaOH
S=H_2SO_4	P=H_3PO_4
F=Field Filtered	O=Other

Remarks

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: _____

E-mail address: jennifer.mengcs@stantec.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP)	Type VI (Raw Data Only)	
Type III (Reduced non-CLP)	NJ DKQP	TX TRRP-13
NYSDEC Category A or B	MA MCP	CT RCP

Relinquished by	Date	Time	Received by	Date	Time
Jim Craft	9/2/2020		Jennell	9-2-20	11:40
Jennell	9/2/20	1609			

EDD Required? Yes (No)
If yes, format: Equis File

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS _____ FedEx _____ Other T

Temperature upon receipt 5.5 °C

Login Sample Receipt Checklist

Client: Stantec Consulting Corp.

Job Number: 410-12818-1

Login Number: 12818
List Number: 1
Creator: Rivera, Tatiana

List Source: Eurofins Lancaster Laboratories Env

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	N/A	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified.	N/A	
Residual Chlorine Checked.	N/A	
Sample custody seals are intact.	True	

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ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Tel: (717)656-2300

Laboratory Job ID: 410-12988-1
Client Project/Site: PES UDEX Release GW Sampling

For:
Stantec Consulting Corp.
1060 Andrew Drive
Suite 140
West Chester, Pennsylvania 19380

Attn: Andrew Klingbeil

Bethany McDaniel

Authorized for release by:
9/16/2020 3:14:29 PM
Bethany McDaniel, Senior Project Manager
(713)358-2005
Bethany.McDaniel@Eurofinset.com

Designee for

Amek Carter, Project Manager
(717)556-7252
amekcarter@eurofinsus.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

* QC recoveries that exceed the upper limits and are associated with non-detect samples are qualified but no further narration is needed since the bias is high and does not change a non-detect result.
* Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
* Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

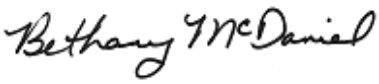
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

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Bethany McDaniel
Senior Project Manager
9/16/2020 3:14:29 PM

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Definitions/Glossary

Client: Stantec Consulting Corp. Job ID: 410-12988-1
Project/Site: PES UDEX Release GW Sampling

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
^c	CCV Recovery is outside acceptance limits.
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 410-12988-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Narrative

Job Narrative
410-12988-1

Comments
No additional comments.

Receipt
The samples were received on 9/3/2020 4:44 PM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was -1.4º C.

Receipt Exceptions
The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): S-428_20200903 (410-12988-5). The container labels list 11:15, while the COC lists 12:42.

The following sample was submitted for analysis; however, it was not listed on the Chain-of-Custody (COC): 3 HCl vials collected on 09/03/20 at 12:45. S-433-20200903 (410-12988-7)

GC/MS VOA
Method 8260C: The continuing calibration verification (CCV) associated with batch 410-43324 recovered above the upper control limit for Bromodichloromethane, Bromoform and Tetrachloroethene. Non-detections of the affected analytes are reported. Any detections are considered estimated.

Method 8260C: The continuing calibration verification (CCV) associated with batch 410-43661 recovered outside acceptance criteria, low biased, for 1,2-Dibromo-3-Chloropropane. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Non-detections of the affected analytes are reported. Any detections are considered estimated.

Method 8260C: The continuing calibration verification (CCV) associated with batch 410-43661 recovered above the upper control limit for Dichlorodifluoromethane. Non-detections of the affected analytes are reported. Any detections are considered estimated.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Stantec Consulting Corp.
Project/Site: PES UDEX Release GW Sampling

Job ID: 410-12988-1

Client Sample ID: S-280_20200902 — Lab Sample ID: 410-12988-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Toluene	410		50	10	ug/L	50		8260C	Total/NA
Cyclohexane	83	J	250	50	ug/L	50		8260C	Total/NA
Benzene - DL	35000		500	100	ug/L	500		8260C	Total/NA

Client Sample ID: S-411_20200902 — Lab Sample ID: 410-12988-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Methylcyclohexane	0.66	J	5.0	0.50	ug/L	1		8260C	Total/NA
Cyclohexane	1.2	J	5.0	1.0	ug/L	1		8260C	Total/NA
Acetone	10	J	20	0.70	ug/L	1		8260C	Total/NA
Benzene	0.58	J	1.0	0.20	ug/L	1		8260C	Total/NA

Client Sample ID: S-413_20200902 — Lab Sample ID: 410-12988-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Methylcyclohexane	120		5.0	0.50	ug/L	1		8260C	Total/NA
Toluene	0.64	J	1.0	0.20	ug/L	1		8260C	Total/NA
Cyclohexane	7.0		5.0	1.0	ug/L	1		8260C	Total/NA
Acetone	100		20	0.70	ug/L	1		8260C	Total/NA
Isopropylbenzene	30		5.0	0.20	ug/L	1		8260C	Total/NA

Client Sample ID: S-284_20200903 — Lab Sample ID: 410-12988-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Methylcyclohexane	1.7	J	5.0	0.50	ug/L	1		8260C	Total/NA
Acetone	1.2	J	20	0.70	ug/L	1		8260C	Total/NA
Isopropylbenzene	0.48	J	5.0	0.20	ug/L	1		8260C	Total/NA

Client Sample ID: S-428_20200903 — Lab Sample ID: 410-12988-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ethylbenzene	2.4		1.0	0.40	ug/L	1		8260C	Total/NA
1,2-Dichloroethane	5.0		1.0	0.30	ug/L	1		8260C	Total/NA
Methylcyclohexane	110		5.0	0.50	ug/L	1		8260C	Total/NA
Toluene	0.66	J	1.0	0.20	ug/L	1		8260C	Total/NA
Cyclohexane	140		5.0	1.0	ug/L	1		8260C	Total/NA
Xylenes, Total	5.6	J	6.0	1.4	ug/L	1		8260C	Total/NA
Acetone	6.1	J	20	0.70	ug/L	1		8260C	Total/NA
Benzene	210		1.0	0.20	ug/L	1		8260C	Total/NA
2-Butanone	1.6	J	10	0.30	ug/L	1		8260C	Total/NA
Isopropylbenzene	15		5.0	0.20	ug/L	1		8260C	Total/NA

Client Sample ID: Trip Blank — Lab Sample ID: 410-12988-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	0.78	J	20	0.70	ug/L	1		8260C	Total/NA

Client Sample ID: S-433-20200903 — Lab Sample ID: 410-12988-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	1.9	J	20	0.70	ug/L	1		8260C	Total/NA
Benzene	1.2		1.0	0.20	ug/L	1		8260C	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Stantec Consulting Corp.
Project/Site: PES UDEX Release GW Sampling

Job ID: 410-12988-1

Client Sample ID: S-280_20200902
Date Collected: 09/02/20 14:10
Date Received: 09/03/20 16:44

Lab Sample ID: 410-12988-1
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		50	10	ug/L			09/10/20 20:09	50
trans-1,3-Dichloropropene	ND		50	10	ug/L			09/10/20 20:09	50
Ethylbenzene	ND		50	20	ug/L			09/10/20 20:09	50
Styrene	ND		250	10	ug/L			09/10/20 20:09	50
1,4-Dichlorobenzene	ND		250	10	ug/L			09/10/20 20:09	50
1,2-Dibromoethane	ND		50	10	ug/L			09/10/20 20:09	50
1,2-Dichloroethane	ND		50	15	ug/L			09/10/20 20:09	50
4-Methyl-2-pentanone	ND		500	25	ug/L			09/10/20 20:09	50
Methylcyclohexane	ND		250	25	ug/L			09/10/20 20:09	50
Toluene	**410**		50	10	ug/L			09/10/20 20:09	50
Chlorobenzene	ND		50	10	ug/L			09/10/20 20:09	50
Cyclohexane	**83**	**J**	250	50	ug/L			09/10/20 20:09	50
1,2,4-Trichlorobenzene	ND		250	15	ug/L			09/10/20 20:09	50
Dibromochloromethane	ND		50	10	ug/L			09/10/20 20:09	50
Xylenes, Total	ND		300	70	ug/L			09/10/20 20:09	50
Tetrachloroethene	ND		50	10	ug/L			09/10/20 20:09	50
cis-1,2-Dichloroethene	ND		50	10	ug/L			09/10/20 20:09	50
trans-1,2-Dichloroethene	ND		250	10	ug/L			09/10/20 20:09	50
Methyl tertiary butyl ether	ND		50	10	ug/L			09/10/20 20:09	50
1,3-Dichlorobenzene	ND		250	10	ug/L			09/10/20 20:09	50
Carbon tetrachloride	ND		50	10	ug/L			09/10/20 20:09	50
2-Hexanone	ND		500	15	ug/L			09/10/20 20:09	50
Acetone	ND	B	1000	35	ug/L			09/10/20 20:09	50
Chloroform	ND		50	10	ug/L			09/10/20 20:09	50
1,1,1-Trichloroethane	ND		50	15	ug/L			09/10/20 20:09	50
Bromomethane	ND		50	15	ug/L			09/10/20 20:09	50
Chloromethane	ND		50	10	ug/L			09/10/20 20:09	50
Chloroethane	ND		50	10	ug/L			09/10/20 20:09	50
Vinyl chloride	ND		50	10	ug/L			09/10/20 20:09	50
Methylene Chloride	ND		50	15	ug/L			09/10/20 20:09	50
Carbon disulfide	ND		250	10	ug/L			09/10/20 20:09	50
Bromoform	ND		200	50	ug/L			09/10/20 20:09	50
Bromodichloromethane	ND		50	10	ug/L			09/10/20 20:09	50
1,1-Dichloroethane	ND		50	10	ug/L			09/10/20 20:09	50
1,1-Dichloroethene	ND		50	10	ug/L			09/10/20 20:09	50
Trichlorofluoromethane	ND		50	10	ug/L			09/10/20 20:09	50
Dichlorodifluoromethane	ND		50	10	ug/L			09/10/20 20:09	50
Freon 113	ND		500	10	ug/L			09/10/20 20:09	50
1,2-Dichloropropane	ND		50	10	ug/L			09/10/20 20:09	50
2-Butanone	ND		500	15	ug/L			09/10/20 20:09	50
1,1,2-Trichloroethane	ND		50	10	ug/L			09/10/20 20:09	50
Trichloroethene	ND		50	10	ug/L			09/10/20 20:09	50
Methyl acetate	ND		250	15	ug/L			09/10/20 20:09	50
1,1,2,2-Tetrachloroethane	ND		50	10	ug/L			09/10/20 20:09	50
1,2-Dichlorobenzene	ND		250	10	ug/L			09/10/20 20:09	50
1,2-Dibromo-3-Chloropropane	ND		250	15	ug/L			09/10/20 20:09	50
Isopropylbenzene	ND		250	10	ug/L			09/10/20 20:09	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*80 - 120*		*09/10/20 20:09*	*50*

Eurofins Lancaster Laboratories Env, LLC

Client Sample ID: S-280_20200902
Lab Sample ID: 410-12988-1

Date Collected: 09/02/20 14:10
Matrix: Water
Date Received: 09/03/20 16:44

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*98*		*80 - 120*		*09/10/20 20:09*	*50*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*09/10/20 20:09*	*50*
Toluene-d8 (Surr)	*100*		*80 - 120*		*09/10/20 20:09*	*50*

Method: 8260C - Volatile Organic Compounds by GC/MS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**35000**		500	100	ug/L			09/10/20 20:32	500

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 120*		*09/10/20 20:32*	*500*
Dibromofluoromethane (Surr)	*99*		*80 - 120*		*09/10/20 20:32*	*500*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*09/10/20 20:32*	*500*
Toluene-d8 (Surr)	*100*		*80 - 120*		*09/10/20 20:32*	*500*

Client Sample ID: S-411_20200902
Lab Sample ID: 410-12988-2

Date Collected: 09/02/20 16:10
Matrix: Water
Date Received: 09/03/20 16:44

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/13/20 21:39	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/13/20 21:39	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/13/20 21:39	1
Styrene	ND		5.0	0.20	ug/L			09/13/20 21:39	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/13/20 21:39	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/13/20 21:39	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/13/20 21:39	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/13/20 21:39	1
Methylcyclohexane	**0.66**	**J**	5.0	0.50	ug/L			09/13/20 21:39	1
Toluene	ND		1.0	0.20	ug/L			09/13/20 21:39	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/13/20 21:39	1
Cyclohexane	**1.2**	**J**	5.0	1.0	ug/L			09/13/20 21:39	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/13/20 21:39	1
Dibromochloromethane	ND	^c	1.0	0.20	ug/L			09/13/20 21:39	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/13/20 21:39	1
Tetrachloroethene	ND	^c	1.0	0.20	ug/L			09/13/20 21:39	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/13/20 21:39	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/13/20 21:39	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/13/20 21:39	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/13/20 21:39	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/13/20 21:39	1
2-Hexanone	ND		10	0.30	ug/L			09/13/20 21:39	1
Acetone	**10**	**J**	20	0.70	ug/L			09/13/20 21:39	1
Chloroform	ND		1.0	0.20	ug/L			09/13/20 21:39	1
Benzene	**0.58**	**J**	1.0	0.20	ug/L			09/13/20 21:39	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/13/20 21:39	1
Bromomethane	ND		1.0	0.30	ug/L			09/13/20 21:39	1
Chloromethane	ND		1.0	0.20	ug/L			09/13/20 21:39	1
Chloroethane	ND		1.0	0.20	ug/L			09/13/20 21:39	1
Vinyl chloride	ND		1.0	0.20	ug/L			09/13/20 21:39	1

Client Sample ID: S-411_20200902
Lab Sample ID: 410-12988-2

Date Collected: 09/02/20 16:10
Matrix: Water
Date Received: 09/03/20 16:44

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylene Chloride	ND		1.0	0.30	ug/L			09/13/20 21:39	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/13/20 21:39	1
Bromoform	ND	^c	4.0	1.0	ug/L			09/13/20 21:39	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/13/20 21:39	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/13/20 21:39	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/13/20 21:39	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/13/20 21:39	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/13/20 21:39	1
Freon 113	ND		10	0.20	ug/L			09/13/20 21:39	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/13/20 21:39	1
2-Butanone	ND		10	0.30	ug/L			09/13/20 21:39	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/13/20 21:39	1
Trichloroethene	ND		1.0	0.20	ug/L			09/13/20 21:39	1
Methyl acetate	ND		5.0	0.30	ug/L			09/13/20 21:39	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/13/20 21:39	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/13/20 21:39	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/13/20 21:39	1
Isopropylbenzene	ND		5.0	0.20	ug/L			09/13/20 21:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*		*09/13/20 21:39*	*1*
Dibromofluoromethane (Surr)	*99*		*80 - 120*		*09/13/20 21:39*	*1*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*09/13/20 21:39*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*09/13/20 21:39*	*1*

Client Sample ID: S-413_20200902
Lab Sample ID: 410-12988-3

Date Collected: 09/02/20 17:45
Matrix: Water
Date Received: 09/03/20 16:44

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/13/20 22:01	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/13/20 22:01	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/13/20 22:01	1
Styrene	ND		5.0	0.20	ug/L			09/13/20 22:01	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/13/20 22:01	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/13/20 22:01	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/13/20 22:01	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/13/20 22:01	1
Methylcyclohexane	**120**		5.0	0.50	ug/L			09/13/20 22:01	1
Toluene	**0.64**	**J**	1.0	0.20	ug/L			09/13/20 22:01	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/13/20 22:01	1
Cyclohexane	**7.0**		5.0	1.0	ug/L			09/13/20 22:01	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/13/20 22:01	1
Dibromochloromethane	ND	^c	1.0	0.20	ug/L			09/13/20 22:01	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/13/20 22:01	1
Tetrachloroethene	ND	^c	1.0	0.20	ug/L			09/13/20 22:01	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/13/20 22:01	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/13/20 22:01	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/13/20 22:01	1

Client Sample ID: S-413_20200902

Lab Sample ID: 410-12988-3

Date Collected: 09/02/20 17:45

Matrix: Water

Date Received: 09/03/20 16:44

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/13/20 22:01	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/13/20 22:01	1
2-Hexanone	ND		10	0.30	ug/L			09/13/20 22:01	1
Acetone	**100**		20	0.70	ug/L			09/13/20 22:01	1
Chloroform	ND		1.0	0.20	ug/L			09/13/20 22:01	1
Benzene	ND		1.0	0.20	ug/L			09/13/20 22:01	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/13/20 22:01	1
Bromomethane	ND		1.0	0.30	ug/L			09/13/20 22:01	1
Chloromethane	ND		1.0	0.20	ug/L			09/13/20 22:01	1
Chloroethane	ND		1.0	0.20	ug/L			09/13/20 22:01	1
Vinyl chloride	ND		1.0	0.20	ug/L			09/13/20 22:01	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/13/20 22:01	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/13/20 22:01	1
Bromoform	ND	^c	4.0	1.0	ug/L			09/13/20 22:01	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/13/20 22:01	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/13/20 22:01	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/13/20 22:01	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/13/20 22:01	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/13/20 22:01	1
Freon 113	ND		10	0.20	ug/L			09/13/20 22:01	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/13/20 22:01	1
2-Butanone	ND		10	0.30	ug/L			09/13/20 22:01	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/13/20 22:01	1
Trichloroethene	ND		1.0	0.20	ug/L			09/13/20 22:01	1
Methyl acetate	ND		5.0	0.30	ug/L			09/13/20 22:01	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/13/20 22:01	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/13/20 22:01	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/13/20 22:01	1
Isopropylbenzene	**30**		5.0	0.20	ug/L			09/13/20 22:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*		*09/13/20 22:01*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 120*		*09/13/20 22:01*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*09/13/20 22:01*	*1*
Toluene-d8 (Surr)	*100*		*80 - 120*		*09/13/20 22:01*	*1*

Client Sample ID: S-284_20200903

Lab Sample ID: 410-12988-4

Date Collected: 09/03/20 09:50

Matrix: Water

Date Received: 09/03/20 16:44

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/15/20 02:05	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/15/20 02:05	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/15/20 02:05	1
Styrene	ND		5.0	0.20	ug/L			09/15/20 02:05	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/15/20 02:05	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/15/20 02:05	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/15/20 02:05	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/15/20 02:05	1

Client: Stantec Consulting Corp.
Project/Site: PES UDEX Release GW Sampling

Job ID: 410-12988-1

Client Sample ID: S-284_20200903
Date Collected: 09/03/20 09:50
Date Received: 09/03/20 16:44

Lab Sample ID: 410-12988-4
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylcyclohexane	**1.7**	**J**	5.0	0.50	ug/L			09/15/20 02:05	1
Toluene	ND		1.0	0.20	ug/L			09/15/20 02:05	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/15/20 02:05	1
Cyclohexane	ND		5.0	1.0	ug/L			09/15/20 02:05	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/15/20 02:05	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/15/20 02:05	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/15/20 02:05	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/15/20 02:05	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/15/20 02:05	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/15/20 02:05	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/15/20 02:05	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/15/20 02:05	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/15/20 02:05	1
2-Hexanone	ND		10	0.30	ug/L			09/15/20 02:05	1
Acetone	**1.2**	**J**	20	0.70	ug/L			09/15/20 02:05	1
Chloroform	ND		1.0	0.20	ug/L			09/15/20 02:05	1
Benzene	ND		1.0	0.20	ug/L			09/15/20 02:05	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/15/20 02:05	1
Bromomethane	ND		1.0	0.30	ug/L			09/15/20 02:05	1
Chloromethane	ND		1.0	0.20	ug/L			09/15/20 02:05	1
Chloroethane	ND		1.0	0.20	ug/L			09/15/20 02:05	1
Vinyl chloride	ND		1.0	0.20	ug/L			09/15/20 02:05	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/15/20 02:05	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/15/20 02:05	1
Bromoform	ND		4.0	1.0	ug/L			09/15/20 02:05	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/15/20 02:05	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/15/20 02:05	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/15/20 02:05	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/15/20 02:05	1
Dichlorodifluoromethane	ND	^c	1.0	0.20	ug/L			09/15/20 02:05	1
Freon 113	ND		10	0.20	ug/L			09/15/20 02:05	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/15/20 02:05	1
2-Butanone	ND		10	0.30	ug/L			09/15/20 02:05	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/15/20 02:05	1
Trichloroethene	ND		1.0	0.20	ug/L			09/15/20 02:05	1
Methyl acetate	ND		5.0	0.30	ug/L			09/15/20 02:05	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/15/20 02:05	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/15/20 02:05	1
1,2-Dibromo-3-Chloropropane	ND	^c	5.0	0.30	ug/L			09/15/20 02:05	1
Isopropylbenzene	**0.48**	**J**	5.0	0.20	ug/L			09/15/20 02:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 120*		*09/15/20 02:05*	*1*
Dibromofluoromethane (Surr)	*102*		*80 - 120*		*09/15/20 02:05*	*1*
4-Bromofluorobenzene (Surr)	*91*		*80 - 120*		*09/15/20 02:05*	*1*
Toluene-d8 (Surr)	*94*		*80 - 120*		*09/15/20 02:05*	*1*

Client: Stantec Consulting Corp.
Project/Site: PES UDEX Release GW Sampling

Job ID: 410-12988-1

Client Sample ID: S-428_20200903
Date Collected: 09/03/20 12:42
Date Received: 09/03/20 16:44

Lab Sample ID: 410-12988-5
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/15/20 04:03	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/15/20 04:03	1
Ethylbenzene	**2.4**		1.0	0.40	ug/L			09/15/20 04:03	1
Styrene	ND		5.0	0.20	ug/L			09/15/20 04:03	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/15/20 04:03	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/15/20 04:03	1
1,2-Dichloroethane	**5.0**		1.0	0.30	ug/L			09/15/20 04:03	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/15/20 04:03	1
Methylcyclohexane	**110**		5.0	0.50	ug/L			09/15/20 04:03	1
Toluene	**0.66**	**J**	1.0	0.20	ug/L			09/15/20 04:03	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/15/20 04:03	1
Cyclohexane	**140**		5.0	1.0	ug/L			09/15/20 04:03	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/15/20 04:03	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/15/20 04:03	1
Xylenes, Total	**5.6**	**J**	6.0	1.4	ug/L			09/15/20 04:03	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/15/20 04:03	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/15/20 04:03	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/15/20 04:03	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/15/20 04:03	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/15/20 04:03	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/15/20 04:03	1
2-Hexanone	ND		10	0.30	ug/L			09/15/20 04:03	1
Acetone	**6.1**	**J**	20	0.70	ug/L			09/15/20 04:03	1
Chloroform	ND		1.0	0.20	ug/L			09/15/20 04:03	1
Benzene	**210**		1.0	0.20	ug/L			09/15/20 04:03	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/15/20 04:03	1
Bromomethane	ND		1.0	0.30	ug/L			09/15/20 04:03	1
Chloromethane	ND		1.0	0.20	ug/L			09/15/20 04:03	1
Chloroethane	ND		1.0	0.20	ug/L			09/15/20 04:03	1
Vinyl chloride	ND		1.0	0.20	ug/L			09/15/20 04:03	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/15/20 04:03	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/15/20 04:03	1
Bromoform	ND		4.0	1.0	ug/L			09/15/20 04:03	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/15/20 04:03	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/15/20 04:03	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/15/20 04:03	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/15/20 04:03	1
Dichlorodifluoromethane	ND	^c	1.0	0.20	ug/L			09/15/20 04:03	1
Freon 113	ND		10	0.20	ug/L			09/15/20 04:03	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/15/20 04:03	1
2-Butanone	**1.6**	**J**	10	0.30	ug/L			09/15/20 04:03	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/15/20 04:03	1
Trichloroethene	ND		1.0	0.20	ug/L			09/15/20 04:03	1
Methyl acetate	ND		5.0	0.30	ug/L			09/15/20 04:03	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/15/20 04:03	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/15/20 04:03	1
1,2-Dibromo-3-Chloropropane	ND	^c	5.0	0.30	ug/L			09/15/20 04:03	1
Isopropylbenzene	**15**		5.0	0.20	ug/L			09/15/20 04:03	1

Client Sample ID: S-428_20200903
Lab Sample ID: 410-12988-5

Date Collected: 09/03/20 12:42
Matrix: Water
Date Received: 09/03/20 16:44

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 120*		*09/15/20 04:03*	*1*
Dibromofluoromethane (Surr)	*103*		*80 - 120*		*09/15/20 04:03*	*1*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*09/15/20 04:03*	*1*
Toluene-d8 (Surr)	*95*		*80 - 120*		*09/15/20 04:03*	*1*

Client Sample ID: Trip Blank
Lab Sample ID: 410-12988-6

Date Collected: 09/03/20 00:00
Matrix: Water
Date Received: 09/03/20 16:44

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/14/20 21:19	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/14/20 21:19	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/14/20 21:19	1
Styrene	ND		5.0	0.20	ug/L			09/14/20 21:19	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/14/20 21:19	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/14/20 21:19	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/14/20 21:19	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/14/20 21:19	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/14/20 21:19	1
Toluene	ND		1.0	0.20	ug/L			09/14/20 21:19	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/14/20 21:19	1
Cyclohexane	ND		5.0	1.0	ug/L			09/14/20 21:19	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/14/20 21:19	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/14/20 21:19	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/14/20 21:19	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/14/20 21:19	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/14/20 21:19	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/14/20 21:19	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/14/20 21:19	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/14/20 21:19	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/14/20 21:19	1
2-Hexanone	ND		10	0.30	ug/L			09/14/20 21:19	1
Acetone	**0.78**	**J**	20	0.70	ug/L			09/14/20 21:19	1
Chloroform	ND		1.0	0.20	ug/L			09/14/20 21:19	1
Benzene	ND		1.0	0.20	ug/L			09/14/20 21:19	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/14/20 21:19	1
Bromomethane	ND		1.0	0.30	ug/L			09/14/20 21:19	1
Chloromethane	ND		1.0	0.20	ug/L			09/14/20 21:19	1
Chloroethane	ND		1.0	0.20	ug/L			09/14/20 21:19	1
Vinyl chloride	ND		1.0	0.20	ug/L			09/14/20 21:19	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/14/20 21:19	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/14/20 21:19	1
Bromoform	ND		4.0	1.0	ug/L			09/14/20 21:19	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/14/20 21:19	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/14/20 21:19	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/14/20 21:19	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/14/20 21:19	1
Dichlorodifluoromethane	ND	^c	1.0	0.20	ug/L			09/14/20 21:19	1
Freon 113	ND		10	0.20	ug/L			09/14/20 21:19	1

Client Sample ID: Trip Blank
Lab Sample ID: 410-12988-6

Date Collected: 09/03/20 00:00
Matrix: Water
Date Received: 09/03/20 16:44

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/14/20 21:19	1
2-Butanone	ND		10	0.30	ug/L			09/14/20 21:19	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/14/20 21:19	1
Trichloroethene	ND		1.0	0.20	ug/L			09/14/20 21:19	1
Methyl acetate	ND		5.0	0.30	ug/L			09/14/20 21:19	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/14/20 21:19	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/14/20 21:19	1
1,2-Dibromo-3-Chloropropane	ND	^c	5.0	0.30	ug/L			09/14/20 21:19	1
Isopropylbenzene	ND		5.0	0.20	ug/L			09/14/20 21:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*80 - 120*		*09/14/20 21:19*	*1*
Dibromofluoromethane (Surr)	*104*		*80 - 120*		*09/14/20 21:19*	*1*
4-Bromofluorobenzene (Surr)	*93*		*80 - 120*		*09/14/20 21:19*	*1*
Toluene-d8 (Surr)	*95*		*80 - 120*		*09/14/20 21:19*	*1*

Client Sample ID: S-433-20200903
Lab Sample ID: 410-12988-7

Date Collected: 09/03/20 12:45
Matrix: Water
Date Received: 09/03/20 16:44

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/15/20 01:41	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/15/20 01:41	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/15/20 01:41	1
Styrene	ND		5.0	0.20	ug/L			09/15/20 01:41	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/15/20 01:41	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/15/20 01:41	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/15/20 01:41	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/15/20 01:41	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/15/20 01:41	1
Toluene	ND		1.0	0.20	ug/L			09/15/20 01:41	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/15/20 01:41	1
Cyclohexane	ND		5.0	1.0	ug/L			09/15/20 01:41	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/15/20 01:41	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/15/20 01:41	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/15/20 01:41	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/15/20 01:41	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/15/20 01:41	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/15/20 01:41	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/15/20 01:41	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/15/20 01:41	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/15/20 01:41	1
2-Hexanone	ND		10	0.30	ug/L			09/15/20 01:41	1
Acetone	**1.9**	**J**	20	0.70	ug/L			09/15/20 01:41	1
Chloroform	ND		1.0	0.20	ug/L			09/15/20 01:41	1
Benzene	**1.2**		1.0	0.20	ug/L			09/15/20 01:41	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/15/20 01:41	1
Bromomethane	ND		1.0	0.30	ug/L			09/15/20 01:41	1
Chloromethane	ND		1.0	0.20	ug/L			09/15/20 01:41	1

Client: Stantec Consulting Corp.
Job ID: 410-12988-1
Project/Site: PES UDEX Release GW Sampling

Client Sample ID: S-433-20200903
Lab Sample ID: 410-12988-7
Date Collected: 09/03/20 12:45
Matrix: Water
Date Received: 09/03/20 16:44

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		1.0	0.20	ug/L			09/15/20 01:41	1
Vinyl chloride	ND		1.0	0.20	ug/L			09/15/20 01:41	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/15/20 01:41	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/15/20 01:41	1
Bromoform	ND		4.0	1.0	ug/L			09/15/20 01:41	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/15/20 01:41	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/15/20 01:41	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/15/20 01:41	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/15/20 01:41	1
Dichlorodifluoromethane	ND	^c	1.0	0.20	ug/L			09/15/20 01:41	1
Freon 113	ND		10	0.20	ug/L			09/15/20 01:41	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/15/20 01:41	1
2-Butanone	ND		10	0.30	ug/L			09/15/20 01:41	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/15/20 01:41	1
Trichloroethene	ND		1.0	0.20	ug/L			09/15/20 01:41	1
Methyl acetate	ND		5.0	0.30	ug/L			09/15/20 01:41	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/15/20 01:41	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/15/20 01:41	1
1,2-Dibromo-3-Chloropropane	ND	^c	5.0	0.30	ug/L			09/15/20 01:41	1
Isopropylbenzene	ND		5.0	0.20	ug/L			09/15/20 01:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 120*		*09/15/20 01:41*	*1*
Dibromofluoromethane (Surr)	*105*		*80 - 120*		*09/15/20 01:41*	*1*
4-Bromofluorobenzene (Surr)	*92*		*80 - 120*		*09/15/20 01:41*	*1*
Toluene-d8 (Surr)	*94*		*80 - 120*		*09/15/20 01:41*	*1*

Surrogate Summary

Client: Stantec Consulting Corp.
Project/Site: PES UDEX Release GW Sampling

Job ID: 410-12988-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	DBFM	BFB	TOL
Lab Sample ID	Client Sample ID	(80-120)	(80-120)	(80-120)	(80-120)
410-12988-1	S-280_20200902	98	98	97	100
410-12988-1 - DL	S-280_20200902	100	99	97	100
410-12988-2	S-411_20200902	101	99	96	98
410-12988-3	S-413_20200902	101	100	98	100
410-12988-4	S-284_20200903	100	102	91	94
410-12988-5	S-428_20200903	102	103	96	95
410-12988-6	Trip Blank	99	104	93	95
410-12988-7	S-433-20200903	100	105	92	94
LCS 410-42455/5	Lab Control Sample	97	98	99	101
LCS 410-43324/4	Lab Control Sample	100	100	97	100
LCS 410-43661/4	Lab Control Sample	105	104	98	95
LCSD 410-43324/5	Lab Control Sample Dup	101	99	98	100
LCSD 410-43661/5	Lab Control Sample Dup	103	101	96	95
MB 410-42455/8	Method Blank	98	97	98	99
MB 410-43324/7	Method Blank	100	99	96	99
MB 410-43661/7	Method Blank	103	102	93	97

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
DBFM = Dibromofluoromethane (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)

Client: Stantec Consulting Corp.
Project/Site: PES UDEX Release GW Sampling

Job ID: 410-12988-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 410-42455/8
Matrix: Water
Analysis Batch: 42455

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/10/20 11:14	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/10/20 11:14	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/10/20 11:14	1
Styrene	ND		5.0	0.20	ug/L			09/10/20 11:14	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/10/20 11:14	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/10/20 11:14	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/10/20 11:14	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/10/20 11:14	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/10/20 11:14	1
Toluene	ND		1.0	0.20	ug/L			09/10/20 11:14	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/10/20 11:14	1
Cyclohexane	ND		5.0	1.0	ug/L			09/10/20 11:14	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/10/20 11:14	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/10/20 11:14	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/10/20 11:14	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/10/20 11:14	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/10/20 11:14	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/10/20 11:14	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/10/20 11:14	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/10/20 11:14	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/10/20 11:14	1
2-Hexanone	ND		10	0.30	ug/L			09/10/20 11:14	1
Acetone	8.66	J B	20	0.70	ug/L			09/10/20 11:14	1
Chloroform	ND		1.0	0.20	ug/L			09/10/20 11:14	1
Benzene	ND		1.0	0.20	ug/L			09/10/20 11:14	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/10/20 11:14	1
Bromomethane	ND		1.0	0.30	ug/L			09/10/20 11:14	1
Chloromethane	ND		1.0	0.20	ug/L			09/10/20 11:14	1
Chloroethane	ND		1.0	0.20	ug/L			09/10/20 11:14	1
Vinyl chloride	ND		1.0	0.20	ug/L			09/10/20 11:14	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/10/20 11:14	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/10/20 11:14	1
Bromoform	ND		4.0	1.0	ug/L			09/10/20 11:14	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/10/20 11:14	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/10/20 11:14	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/10/20 11:14	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/10/20 11:14	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/10/20 11:14	1
Freon 113	ND		10	0.20	ug/L			09/10/20 11:14	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/10/20 11:14	1
2-Butanone	ND		10	0.30	ug/L			09/10/20 11:14	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/10/20 11:14	1
Trichloroethene	ND		1.0	0.20	ug/L			09/10/20 11:14	1
Methyl acetate	ND		5.0	0.30	ug/L			09/10/20 11:14	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/10/20 11:14	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/10/20 11:14	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/10/20 11:14	1
Isopropylbenzene	ND		5.0	0.20	ug/L			09/10/20 11:14	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-42455/8
Matrix: Water
Analysis Batch: 42455

Client Sample ID: Method Blank
Prep Type: Total/NA

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*98*		*80 - 120*		*09/10/20 11:14*	*1*
Dibromofluoromethane (Surr)	*97*		*80 - 120*		*09/10/20 11:14*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*09/10/20 11:14*	*1*
Toluene-d8 (Surr)	*99*		*80 - 120*		*09/10/20 11:14*	*1*

Lab Sample ID: LCS 410-42455/5
Matrix: Water
Analysis Batch: 42455

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,3-Dichloropropene	20.0	20.3		ug/L		101	75 - 120
trans-1,3-Dichloropropene	20.0	20.2		ug/L		101	67 - 120
Ethylbenzene	20.0	20.5		ug/L		102	80 - 120
Styrene	20.0	20.6		ug/L		103	80 - 120
1,4-Dichlorobenzene	20.0	20.7		ug/L		103	80 - 120
1,2-Dibromoethane	20.0	19.9		ug/L		100	77 - 120
1,2-Dichloroethane	20.0	19.2		ug/L		96	73 - 124
4-Methyl-2-pentanone	100	94.8		ug/L		95	62 - 133
Methylcyclohexane	20.0	21.2		ug/L		106	67 - 121
Toluene	20.0	20.5		ug/L		102	80 - 120
Chlorobenzene	20.0	20.6		ug/L		103	80 - 120
Cyclohexane	20.0	20.0		ug/L		100	68 - 126
1,2,4-Trichlorobenzene	20.0	19.7		ug/L		99	63 - 120
Dibromochloromethane	20.0	20.8		ug/L		104	71 - 120
Xylenes, Total	60.0	62.7		ug/L		105	80 - 120
Tetrachloroethene	20.0	20.7		ug/L		103	80 - 120
cis-1,2-Dichloroethene	20.0	21.0		ug/L		105	80 - 125
trans-1,2-Dichloroethene	20.0	19.4		ug/L		97	80 - 126
Methyl tertiary butyl ether	20.0	18.7		ug/L		93	69 - 122
1,3-Dichlorobenzene	20.0	20.5		ug/L		102	80 - 120
Carbon tetrachloride	20.0	20.2		ug/L		101	64 - 134
2-Hexanone	100	95.3		ug/L		95	56 - 135
Acetone	150	154		ug/L		103	54 - 157
Chloroform	20.0	20.0		ug/L		100	80 - 120
Benzene	20.0	20.1		ug/L		101	80 - 120
1,1,1-Trichloroethane	20.0	19.7		ug/L		99	67 - 126
Bromomethane	20.0	15.5		ug/L		78	53 - 128
Chloromethane	20.0	16.0		ug/L		80	56 - 121
Chloroethane	20.0	14.6		ug/L		73	55 - 123
Vinyl chloride	20.0	16.9		ug/L		84	56 - 120
Methylene Chloride	20.0	19.9		ug/L		99	80 - 120
Carbon disulfide	20.0	18.9		ug/L		95	65 - 128
Bromoform	20.0	19.3		ug/L		96	51 - 120
Bromodichloromethane	20.0	20.0		ug/L		100	71 - 120
1,1-Dichloroethane	20.0	19.9		ug/L		100	80 - 120
1,1-Dichloroethene	20.0	19.4		ug/L		97	80 - 131
Trichlorofluoromethane	20.0	17.1		ug/L		86	55 - 135
Dichlorodifluoromethane	20.0	16.2		ug/L		81	41 - 127

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-42455/5
Matrix: Water
Analysis Batch: 42455

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Freon 113	20.0	19.0		ug/L		95	73 - 139
1,2-Dichloropropane	20.0	20.6		ug/L		103	80 - 120
2-Butanone	150	146		ug/L		97	59 - 135
1,1,2-Trichloroethane	20.0	21.1		ug/L		106	80 - 120
Trichloroethene	20.0	20.2		ug/L		101	80 - 120
Methyl acetate	20.0	19.9		ug/L		99	54 - 136
1,1,2,2-Tetrachloroethane	20.0	20.2		ug/L		101	72 - 120
1,2-Dichlorobenzene	20.0	20.5		ug/L		102	80 - 120
1,2-Dibromo-3-Chloropropane	20.0	19.2		ug/L		96	47 - 131
Isopropylbenzene	20.0	20.9		ug/L		105	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*80 - 120*
Dibromofluoromethane (Surr)	*98*		*80 - 120*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*
Toluene-d8 (Surr)	*101*		*80 - 120*

Lab Sample ID: MB 410-43324/7
Matrix: Water
Analysis Batch: 43324

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/13/20 20:15	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/13/20 20:15	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/13/20 20:15	1
Styrene	ND		5.0	0.20	ug/L			09/13/20 20:15	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/13/20 20:15	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/13/20 20:15	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/13/20 20:15	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/13/20 20:15	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/13/20 20:15	1
Toluene	ND		1.0	0.20	ug/L			09/13/20 20:15	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/13/20 20:15	1
Cyclohexane	ND		5.0	1.0	ug/L			09/13/20 20:15	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/13/20 20:15	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/13/20 20:15	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/13/20 20:15	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/13/20 20:15	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/13/20 20:15	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/13/20 20:15	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/13/20 20:15	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/13/20 20:15	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/13/20 20:15	1
2-Hexanone	ND		10	0.30	ug/L			09/13/20 20:15	1
Acetone	ND		20	0.70	ug/L			09/13/20 20:15	1
Chloroform	ND		1.0	0.20	ug/L			09/13/20 20:15	1
Benzene	ND		1.0	0.20	ug/L			09/13/20 20:15	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/13/20 20:15	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-43324/7
Matrix: Water
Analysis Batch: 43324

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromomethane	ND		1.0	0.30	ug/L			09/13/20 20:15	1
Chloromethane	ND		1.0	0.20	ug/L			09/13/20 20:15	1
Chloroethane	ND		1.0	0.20	ug/L			09/13/20 20:15	1
Vinyl chloride	ND		1.0	0.20	ug/L			09/13/20 20:15	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/13/20 20:15	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/13/20 20:15	1
Bromoform	ND		4.0	1.0	ug/L			09/13/20 20:15	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/13/20 20:15	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/13/20 20:15	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/13/20 20:15	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/13/20 20:15	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/13/20 20:15	1
Freon 113	ND		10	0.20	ug/L			09/13/20 20:15	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/13/20 20:15	1
2-Butanone	ND		10	0.30	ug/L			09/13/20 20:15	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/13/20 20:15	1
Trichloroethene	ND		1.0	0.20	ug/L			09/13/20 20:15	1
Methyl acetate	ND		5.0	0.30	ug/L			09/13/20 20:15	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/13/20 20:15	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/13/20 20:15	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/13/20 20:15	1
Isopropylbenzene	ND		5.0	0.20	ug/L			09/13/20 20:15	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 120*		*09/13/20 20:15*	*1*
Dibromofluoromethane (Surr)	*99*		*80 - 120*		*09/13/20 20:15*	*1*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*09/13/20 20:15*	*1*
Toluene-d8 (Surr)	*99*		*80 - 120*		*09/13/20 20:15*	*1*

Lab Sample ID: LCS 410-43324/4
Matrix: Water
Analysis Batch: 43324

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,3-Dichloropropene	20.0	20.9		ug/L		105	75 - 120
trans-1,3-Dichloropropene	20.0	20.8		ug/L		104	67 - 120
Ethylbenzene	20.0	20.9		ug/L		104	80 - 120
Styrene	20.0	21.0		ug/L		105	80 - 120
1,4-Dichlorobenzene	20.0	21.5		ug/L		108	80 - 120
1,2-Dibromoethane	20.0	20.5		ug/L		103	77 - 120
1,2-Dichloroethane	20.0	20.5		ug/L		103	73 - 124
4-Methyl-2-pentanone	100	96.4		ug/L		96	62 - 133
Methylcyclohexane	20.0	20.5		ug/L		103	67 - 121
Toluene	20.0	21.1		ug/L		106	80 - 120
Chlorobenzene	20.0	21.2		ug/L		106	80 - 120
Cyclohexane	20.0	19.3		ug/L		97	68 - 126
1,2,4-Trichlorobenzene	20.0	21.5		ug/L		108	63 - 120
Dibromochloromethane	20.0	21.6		ug/L		108	71 - 120

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-43324/4
Matrix: Water
Analysis Batch: 43324

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Xylenes, Total	60.0	64.2		ug/L		107	80 - 120
Tetrachloroethene	20.0	21.3		ug/L		107	80 - 120
cis-1,2-Dichloroethene	20.0	21.7		ug/L		108	80 - 125
trans-1,2-Dichloroethene	20.0	20.6		ug/L		103	80 - 126
Methyl tertiary butyl ether	20.0	19.5		ug/L		97	69 - 122
1,3-Dichlorobenzene	20.0	21.5		ug/L		107	80 - 120
Carbon tetrachloride	20.0	21.6		ug/L		108	64 - 134
2-Hexanone	100	95.0		ug/L		95	56 - 135
Acetone	150	145		ug/L		97	54 - 157
Chloroform	20.0	21.1		ug/L		106	80 - 120
Benzene	20.0	20.7		ug/L		104	80 - 120
1,1,1-Trichloroethane	20.0	21.0		ug/L		105	67 - 126
Bromomethane	20.0	16.5		ug/L		83	53 - 128
Chloromethane	20.0	16.7		ug/L		84	56 - 121
Chloroethane	20.0	15.1		ug/L		75	55 - 123
Vinyl chloride	20.0	17.4		ug/L		87	56 - 120
Methylene Chloride	20.0	21.1		ug/L		106	80 - 120
Carbon disulfide	20.0	20.7		ug/L		103	65 - 128
Bromoform	20.0	20.7		ug/L		103	51 - 120
Bromodichloromethane	20.0	21.1		ug/L		106	71 - 120
1,1-Dichloroethane	20.0	20.8		ug/L		104	80 - 120
1,1-Dichloroethene	20.0	20.6		ug/L		103	80 - 131
Trichlorofluoromethane	20.0	17.5		ug/L		87	55 - 135
Dichlorodifluoromethane	20.0	17.5		ug/L		87	41 - 127
Freon 113	20.0	19.4		ug/L		97	73 - 139
1,2-Dichloropropane	20.0	20.7		ug/L		104	80 - 120
2-Butanone	150	147		ug/L		98	59 - 135
1,1,2-Trichloroethane	20.0	21.4		ug/L		107	80 - 120
Trichloroethene	20.0	21.1		ug/L		105	80 - 120
Methyl acetate	20.0	20.4		ug/L		102	54 - 136
1,1,2,2-Tetrachloroethane	20.0	20.6		ug/L		103	72 - 120
1,2-Dichlorobenzene	20.0	21.3		ug/L		106	80 - 120
1,2-Dibromo-3-Chloropropane	20.0	20.4		ug/L		102	47 - 131
Isopropylbenzene	20.0	21.6		ug/L		108	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 120*
Dibromofluoromethane (Surr)	*100*		*80 - 120*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*
Toluene-d8 (Surr)	*100*		*80 - 120*

Lab Sample ID: LCSD 410-43324/5
Matrix: Water
Analysis Batch: 43324

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,3-Dichloropropene	20.0	21.3		ug/L		106	75 - 120	2	30
trans-1,3-Dichloropropene	20.0	20.8		ug/L		104	67 - 120	0	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-43324/5
Matrix: Water
Analysis Batch: 43324

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethylbenzene	20.0	20.9		ug/L		104	80 - 120	0	30
Styrene	20.0	21.1		ug/L		105	80 - 120	0	30
1,4-Dichlorobenzene	20.0	21.1		ug/L		106	80 - 120	2	30
1,2-Dibromoethane	20.0	20.6		ug/L		103	77 - 120	0	30
1,2-Dichloroethane	20.0	20.5		ug/L		102	73 - 124	0	30
4-Methyl-2-pentanone	100	96.7		ug/L		97	62 - 133	0	30
Methylcyclohexane	20.0	20.5		ug/L		102	67 - 121	0	30
Toluene	20.0	21.1		ug/L		106	80 - 120	0	30
Chlorobenzene	20.0	21.4		ug/L		107	80 - 120	1	30
Cyclohexane	20.0	19.5		ug/L		98	68 - 126	1	30
1,2,4-Trichlorobenzene	20.0	20.8		ug/L		104	63 - 120	3	30
Dibromochloromethane	20.0	21.8		ug/L		109	71 - 120	1	30
Xylenes, Total	60.0	64.3		ug/L		107	80 - 120	0	30
Tetrachloroethene	20.0	21.3		ug/L		106	80 - 120	0	30
cis-1,2-Dichloroethene	20.0	22.0		ug/L		110	80 - 125	1	30
trans-1,2-Dichloroethene	20.0	21.0		ug/L		105	80 - 126	2	30
Methyl tertiary butyl ether	20.0	19.7		ug/L		99	69 - 122	1	30
1,3-Dichlorobenzene	20.0	21.3		ug/L		107	80 - 120	1	30
Carbon tetrachloride	20.0	21.3		ug/L		107	64 - 134	1	30
2-Hexanone	100	96.4		ug/L		96	56 - 135	1	30
Acetone	150	142		ug/L		95	54 - 157	2	30
Chloroform	20.0	21.1		ug/L		106	80 - 120	0	30
Benzene	20.0	20.8		ug/L		104	80 - 120	0	30
1,1,1-Trichloroethane	20.0	21.2		ug/L		106	67 - 126	1	30
Bromomethane	20.0	16.5		ug/L		83	53 - 128	0	30
Chloromethane	20.0	16.6		ug/L		83	56 - 121	1	30
Chloroethane	20.0	15.1		ug/L		76	55 - 123	0	30
Vinyl chloride	20.0	17.7		ug/L		89	56 - 120	2	30
Methylene Chloride	20.0	21.3		ug/L		106	80 - 120	1	30
Carbon disulfide	20.0	20.7		ug/L		104	65 - 128	0	30
Bromoform	20.0	20.7		ug/L		104	51 - 120	0	30
Bromodichloromethane	20.0	20.9		ug/L		104	71 - 120	1	30
1,1-Dichloroethane	20.0	20.7		ug/L		104	80 - 120	0	30
1,1-Dichloroethene	20.0	21.0		ug/L		105	80 - 131	2	30
Trichlorofluoromethane	20.0	17.6		ug/L		88	55 - 135	1	30
Dichlorodifluoromethane	20.0	17.4		ug/L		87	41 - 127	0	30
Freon 113	20.0	19.3		ug/L		97	73 - 139	1	30
1,2-Dichloropropane	20.0	20.8		ug/L		104	80 - 120	0	30
2-Butanone	150	149		ug/L		99	59 - 135	1	30
1,1,2-Trichloroethane	20.0	21.7		ug/L		108	80 - 120	1	30
Trichloroethene	20.0	21.3		ug/L		107	80 - 120	1	30
Methyl acetate	20.0	20.8		ug/L		104	54 - 136	2	30
1,1,2,2-Tetrachloroethane	20.0	20.4		ug/L		102	72 - 120	1	30
1,2-Dichlorobenzene	20.0	21.1		ug/L		105	80 - 120	1	30
1,2-Dibromo-3-Chloropropane	20.0	19.7		ug/L		99	47 - 131	3	30
Isopropylbenzene	20.0	21.6		ug/L		108	80 - 120	0	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-43324/5
Matrix: Water
Analysis Batch: 43324

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*
Dibromofluoromethane (Surr)	*99*		*80 - 120*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*
Toluene-d8 (Surr)	*100*		*80 - 120*

Lab Sample ID: MB 410-43661/7
Matrix: Water
Analysis Batch: 43661

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/14/20 20:06	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/14/20 20:06	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/14/20 20:06	1
Styrene	ND		5.0	0.20	ug/L			09/14/20 20:06	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/14/20 20:06	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/14/20 20:06	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/14/20 20:06	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/14/20 20:06	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/14/20 20:06	1
Toluene	ND		1.0	0.20	ug/L			09/14/20 20:06	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/14/20 20:06	1
Cyclohexane	ND		5.0	1.0	ug/L			09/14/20 20:06	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/14/20 20:06	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/14/20 20:06	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/14/20 20:06	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/14/20 20:06	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/14/20 20:06	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/14/20 20:06	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/14/20 20:06	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/14/20 20:06	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/14/20 20:06	1
2-Hexanone	ND		10	0.30	ug/L			09/14/20 20:06	1
Acetone	ND		20	0.70	ug/L			09/14/20 20:06	1
Chloroform	ND		1.0	0.20	ug/L			09/14/20 20:06	1
Benzene	ND		1.0	0.20	ug/L			09/14/20 20:06	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/14/20 20:06	1
Bromomethane	ND		1.0	0.30	ug/L			09/14/20 20:06	1
Chloromethane	ND		1.0	0.20	ug/L			09/14/20 20:06	1
Chloroethane	ND		1.0	0.20	ug/L			09/14/20 20:06	1
Vinyl chloride	ND		1.0	0.20	ug/L			09/14/20 20:06	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/14/20 20:06	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/14/20 20:06	1
Bromoform	ND		4.0	1.0	ug/L			09/14/20 20:06	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/14/20 20:06	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/14/20 20:06	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/14/20 20:06	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/14/20 20:06	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/14/20 20:06	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-43661/7
Matrix: Water
Analysis Batch: 43661

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Freon 113	ND		10	0.20	ug/L			09/14/20 20:06	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/14/20 20:06	1
2-Butanone	ND		10	0.30	ug/L			09/14/20 20:06	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/14/20 20:06	1
Trichloroethene	ND		1.0	0.20	ug/L			09/14/20 20:06	1
Methyl acetate	ND		5.0	0.30	ug/L			09/14/20 20:06	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/14/20 20:06	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/14/20 20:06	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/14/20 20:06	1
Isopropylbenzene	ND		5.0	0.20	ug/L			09/14/20 20:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*80 - 120*		*09/14/20 20:06*	*1*
Dibromofluoromethane (Surr)	*102*		*80 - 120*		*09/14/20 20:06*	*1*
4-Bromofluorobenzene (Surr)	*93*		*80 - 120*		*09/14/20 20:06*	*1*
Toluene-d8 (Surr)	*97*		*80 - 120*		*09/14/20 20:06*	*1*

Lab Sample ID: LCS 410-43661/4
Matrix: Water
Analysis Batch: 43661

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,3-Dichloropropene	20.0	18.8		ug/L		94	75 - 120
trans-1,3-Dichloropropene	20.0	17.5		ug/L		88	67 - 120
Ethylbenzene	20.0	17.9		ug/L		89	80 - 120
Styrene	20.0	18.0		ug/L		90	80 - 120
1,4-Dichlorobenzene	20.0	18.2		ug/L		91	80 - 120
1,2-Dibromoethane	20.0	17.6		ug/L		88	77 - 120
1,2-Dichloroethane	20.0	18.5		ug/L		92	73 - 124
4-Methyl-2-pentanone	100	81.8		ug/L		82	62 - 133
Methylcyclohexane	20.0	18.5		ug/L		92	67 - 121
Toluene	20.0	17.9		ug/L		90	80 - 120
Chlorobenzene	20.0	19.0		ug/L		95	80 - 120
Cyclohexane	20.0	19.7		ug/L		99	68 - 126
1,2,4-Trichlorobenzene	20.0	18.7		ug/L		94	63 - 120
Dibromochloromethane	20.0	19.3		ug/L		96	71 - 120
Xylenes, Total	60.0	54.5		ug/L		91	80 - 120
Tetrachloroethene	20.0	18.3		ug/L		92	80 - 120
cis-1,2-Dichloroethene	20.0	20.8		ug/L		104	80 - 125
trans-1,2-Dichloroethene	20.0	19.0		ug/L		95	80 - 126
Methyl tertiary butyl ether	20.0	19.5		ug/L		98	69 - 122
1,3-Dichlorobenzene	20.0	17.5		ug/L		88	80 - 120
Carbon tetrachloride	20.0	20.0		ug/L		100	64 - 134
2-Hexanone	100	75.1		ug/L		75	56 - 135
Acetone	150	137		ug/L		92	54 - 157
Chloroform	20.0	19.1		ug/L		96	80 - 120
Benzene	20.0	19.3		ug/L		96	80 - 120
1,1,1-Trichloroethane	20.0	19.4		ug/L		97	67 - 126

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-43661/4
Matrix: Water
Analysis Batch: 43661

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Bromomethane			20.0	20.4		ug/L		102	53 - 128		
Chloromethane			20.0	19.2		ug/L		96	56 - 121		
Chloroethane			20.0	18.0		ug/L		90	55 - 123		
Vinyl chloride			20.0	20.3		ug/L		102	56 - 120		
Methylene Chloride			20.0	20.2		ug/L		101	80 - 120		
Carbon disulfide			20.0	19.6		ug/L		98	65 - 128		
Bromoform			20.0	18.0		ug/L		90	51 - 120		
Bromodichloromethane			20.0	19.1		ug/L		95	71 - 120		
1,1-Dichloroethane			20.0	19.0		ug/L		95	80 - 120		
1,1-Dichloroethene			20.0	20.2		ug/L		101	80 - 131		
Trichlorofluoromethane			20.0	19.2		ug/L		96	55 - 135		
Dichlorodifluoromethane			20.0	22.1		ug/L		110	41 - 127		
Freon 113			20.0	19.0		ug/L		95	73 - 139		
1,2-Dichloropropane			20.0	20.3		ug/L		101	80 - 120		
2-Butanone			150	113		ug/L		75	59 - 135		
1,1,2-Trichloroethane			20.0	19.0		ug/L		95	80 - 120		
Trichloroethene			20.0	19.3		ug/L		97	80 - 120		
Methyl acetate			20.0	15.5		ug/L		78	54 - 136		
1,1,2,2-Tetrachloroethane			20.0	15.3		ug/L		77	72 - 120		
1,2-Dichlorobenzene			20.0	17.7		ug/L		89	80 - 120		
1,2-Dibromo-3-Chloropropane			20.0	14.2		ug/L		71	47 - 131		
Isopropylbenzene			20.0	18.0		ug/L		90	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*80 - 120*
Dibromofluoromethane (Surr)	*104*		*80 - 120*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*
Toluene-d8 (Surr)	*95*		*80 - 120*

Lab Sample ID: LCSD 410-43661/5
Matrix: Water
Analysis Batch: 43661

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,3-Dichloropropene			20.0	19.7		ug/L		99	75 - 120	5	30
trans-1,3-Dichloropropene			20.0	18.4		ug/L		92	67 - 120	5	30
Ethylbenzene			20.0	18.5		ug/L		93	80 - 120	4	30
Styrene			20.0	18.8		ug/L		94	80 - 120	4	30
1,4-Dichlorobenzene			20.0	19.0		ug/L		95	80 - 120	4	30
1,2-Dibromoethane			20.0	18.3		ug/L		92	77 - 120	4	30
1,2-Dichloroethane			20.0	19.0		ug/L		95	73 - 124	3	30
4-Methyl-2-pentanone			100	93.3		ug/L		93	62 - 133	13	30
Methylcyclohexane			20.0	18.2		ug/L		91	67 - 121	2	30
Toluene			20.0	18.8		ug/L		94	80 - 120	5	30
Chlorobenzene			20.0	19.4		ug/L		97	80 - 120	2	30
Cyclohexane			20.0	19.6		ug/L		98	68 - 126	1	30
1,2,4-Trichlorobenzene			20.0	19.4		ug/L		97	63 - 120	4	30
Dibromochloromethane			20.0	19.1		ug/L		95	71 - 120	1	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-43661/5
Matrix: Water
Analysis Batch: 43661

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Xylenes, Total			60.0	57.1		ug/L		95	80 - 120	5	30
Tetrachloroethene			20.0	19.7		ug/L		99	80 - 120	7	30
cis-1,2-Dichloroethene			20.0	21.1		ug/L		106	80 - 125	2	30
trans-1,2-Dichloroethene			20.0	19.5		ug/L		97	80 - 126	3	30
Methyl tertiary butyl ether			20.0	20.9		ug/L		104	69 - 122	7	30
1,3-Dichlorobenzene			20.0	18.9		ug/L		94	80 - 120	7	30
Carbon tetrachloride			20.0	19.8		ug/L		99	64 - 134	1	30
2-Hexanone			100	87.1		ug/L		87	56 - 135	15	30
Acetone			150	145		ug/L		97	54 - 157	5	30
Chloroform			20.0	19.6		ug/L		98	80 - 120	2	30
Benzene			20.0	20.3		ug/L		102	80 - 120	6	30
1,1,1-Trichloroethane			20.0	20.8		ug/L		104	67 - 126	7	30
Bromomethane			20.0	20.8		ug/L		104	53 - 128	2	30
Chloromethane			20.0	19.6		ug/L		98	56 - 121	2	30
Chloroethane			20.0	19.6		ug/L		98	55 - 123	8	30
Vinyl chloride			20.0	20.6		ug/L		103	56 - 120	1	30
Methylene Chloride			20.0	21.4		ug/L		107	80 - 120	6	30
Carbon disulfide			20.0	19.8		ug/L		99	65 - 128	1	30
Bromoform			20.0	19.3		ug/L		97	51 - 120	7	30
Bromodichloromethane			20.0	20.0		ug/L		100	71 - 120	5	30
1,1-Dichloroethane			20.0	20.1		ug/L		101	80 - 120	6	30
1,1-Dichloroethene			20.0	20.5		ug/L		103	80 - 131	2	30
Trichlorofluoromethane			20.0	20.0		ug/L		100	55 - 135	4	30
Dichlorodifluoromethane			20.0	21.2		ug/L		106	41 - 127	4	30
Freon 113			20.0	19.0		ug/L		95	73 - 139	0	30
1,2-Dichloropropane			20.0	20.6		ug/L		103	80 - 120	2	30
2-Butanone			150	134		ug/L		89	59 - 135	17	30
1,1,2-Trichloroethane			20.0	19.3		ug/L		97	80 - 120	2	30
Trichloroethene			20.0	20.0		ug/L		100	80 - 120	3	30
Methyl acetate			20.0	18.6		ug/L		93	54 - 136	18	30
1,1,2,2-Tetrachloroethane			20.0	17.6		ug/L		88	72 - 120	14	30
1,2-Dichlorobenzene			20.0	18.8		ug/L		94	80 - 120	6	30
1,2-Dibromo-3-Chloropropane			20.0	15.4		ug/L		77	47 - 131	8	30
Isopropylbenzene			20.0	18.8		ug/L		94	80 - 120	4	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*80 - 120*
Dibromofluoromethane (Surr)	*101*		*80 - 120*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*
Toluene-d8 (Surr)	*95*		*80 - 120*

QC Association Summary

Client: Stantec Consulting Corp.
Job ID: 410-12988-1
Project/Site: PES UDEX Release GW Sampling

GC/MS VOA

Analysis Batch: 42455

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-12988-1	S-280_20200902	Total/NA	Water	8260C	
410-12988-1 - DL	S-280_20200902	Total/NA	Water	8260C	
MB 410-42455/8	Method Blank	Total/NA	Water	8260C	
LCS 410-42455/5	Lab Control Sample	Total/NA	Water	8260C	

Analysis Batch: 43324

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-12988-2	S-411_20200902	Total/NA	Water	8260C	
410-12988-3	S-413_20200902	Total/NA	Water	8260C	
MB 410-43324/7	Method Blank	Total/NA	Water	8260C	
LCS 410-43324/4	Lab Control Sample	Total/NA	Water	8260C	
LCSD 410-43324/5	Lab Control Sample Dup	Total/NA	Water	8260C	

Analysis Batch: 43661

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-12988-4	S-284_20200903	Total/NA	Water	8260C	
410-12988-5	S-428_20200903	Total/NA	Water	8260C	
410-12988-6	Trip Blank	Total/NA	Water	8260C	
410-12988-7	S-433-20200903	Total/NA	Water	8260C	
MB 410-43661/7	Method Blank	Total/NA	Water	8260C	
LCS 410-43661/4	Lab Control Sample	Total/NA	Water	8260C	
LCSD 410-43661/5	Lab Control Sample Dup	Total/NA	Water	8260C	

Lab Chronicle

Client: Stantec Consulting Corp.
Job ID: 410-12988-1
Project/Site: PES UDEX Release GW Sampling

Client Sample ID: S-280_20200902
Lab Sample ID: 410-12988-1
Date Collected: 09/02/20 14:10
Matrix: Water
Date Received: 09/03/20 16:44

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		50	42455	09/10/20 20:09	K4WN	ELLE
Total/NA	Analysis	8260C	DL	500	42455	09/10/20 20:32	K4WN	ELLE

Client Sample ID: S-411_20200902
Lab Sample ID: 410-12988-2
Date Collected: 09/02/20 16:10
Matrix: Water
Date Received: 09/03/20 16:44

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	43324	09/13/20 21:39	ULCP	ELLE

Client Sample ID: S-413_20200902
Lab Sample ID: 410-12988-3
Date Collected: 09/02/20 17:45
Matrix: Water
Date Received: 09/03/20 16:44

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	43324	09/13/20 22:01	ULCP	ELLE

Client Sample ID: S-284_20200903
Lab Sample ID: 410-12988-4
Date Collected: 09/03/20 09:50
Matrix: Water
Date Received: 09/03/20 16:44

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	43661	09/15/20 02:05	TQ4J	ELLE

Client Sample ID: S-428_20200903
Lab Sample ID: 410-12988-5
Date Collected: 09/03/20 12:42
Matrix: Water
Date Received: 09/03/20 16:44

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	43661	09/15/20 04:03	TQ4J	ELLE

Client Sample ID: Trip Blank
Lab Sample ID: 410-12988-6
Date Collected: 09/03/20 00:00
Matrix: Water
Date Received: 09/03/20 16:44

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	43661	09/14/20 21:19	TQ4J	ELLE

Client Sample ID: S-433-20200903
Lab Sample ID: 410-12988-7
Date Collected: 09/03/20 12:45
Matrix: Water
Date Received: 09/03/20 16:44

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	43661	09/15/20 01:41	TQ4J	ELLE

Lab Chronicle

Client: Stantec Consulting Corp.
Job ID: 410-12988-1
Project/Site: PES UDEX Release GW Sampling

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Stantec Consulting Corp. Job ID: 410-12988-1
Project/Site: PES UDEX Release GW Sampling

Laboratory: Eurofins Lancaster Laboratories Env, LLC

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Pennsylvania	NELAP	36-00037	01-31-21

Method Summary

Client: Stantec Consulting Corp.
Job ID: 410-12988-1
Project/Site: PES UDEX Release GW Sampling

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	ELLE
5030C	Purge and Trap	SW846	ELLE

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: Stantec Consulting Corp.
Job ID: 410-12988-1
Project/Site: PES UDEX Release GW Sampling

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
410-12988-1	S-280_20200902	Water	09/02/20 14:10	09/03/20 16:44	
410-12988-2	S-411_20200902	Water	09/02/20 16:10	09/03/20 16:44	
410-12988-3	S-413_20200902	Water	09/02/20 17:45	09/03/20 16:44	
410-12988-4	S-284_20200903	Water	09/03/20 09:50	09/03/20 16:44	
410-12988-5	S-428_20200903	Water	09/03/20 12:42	09/03/20 16:44	
410-12988-6	Trip Blank	Water	09/03/20 00:00	09/03/20 16:44	
410-12988-7	S-433-20200903	Water	09/03/20 12:45	09/03/20 16:44	

Analysis Request/Chain of Custody

410-12988 Chain of Custody

For Eurofins Lancaster Laboratories Environmental use only

Acct. # _____ Group # _____ Sample # _____

COC #612314

Client Information

Client: Stantec Consulting	Acct. #:
Project Name/#: PES UDEX	PWSID #:
Project Manager: Jennifer Menges	P.O. #: 2134O3039
Sampler: Jim Craft	Quote #:
State where samples were collected: PA	For Compliance: Yes ☐ No ☑

Matrix

Soil ☐ Sediment ☐ Tissue ☐ | Water ☑ Potable ☐ Ground ☐ NPDES ☐ Surface ☐ | Other: _____

Analysis Requested

Preservation and Filtration Codes

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	H	VOC 8260C
S-280-20200902	9/2/2020	1410	✓		3		X
S-411-20200902	9/2/2020	1610	✓		3		X
S-413-20200902	9/2/2020	1745	✓		3		X
S-284-20200903	9/3/2020	0950	✓		3		X
S-428-20200903	9/3/2020	1242	✓		3		X
Trip Blank	9/3/2020	—	✓		2		X

For Lab Use Only

FSC: _____

SCR#: _____

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 P=H_3PO_4
F=Field Filtered O=Other

Remarks

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: _____

E-mail address: jennifer.menges@stantec.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) | Type VI (Raw Data Only)

Type III (Reduced non-CLP) | NJ DKQP | TX TRRP-13

NYSDEC Category A or B | MA MCP | CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	9/3/2020	1259	Pierre	9/3/20	13°C
Pierre	9/3/20	2c 1610	[signature]		
			[signature]	9-3-20	1644

EDD Required? Yes No

If yes, format: EDD Equis 4 file

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS _____ FedEx _____ Other _____

Temperature upon receipt -1.4 °C

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The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 0919

TMR

NR

Login Sample Receipt Checklist

Client: Stantec Consulting Corp.

Job Number: 410-12988-1

Login Number: 12988

List Source: Eurofins Lancaster Laboratories Env

List Number: 1

Creator: Rivera, Tatiana

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	N/A	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified.	N/A	
Residual Chlorine Checked.	N/A	
Sample custody seals are intact.	True	

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ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Tel: (717)656-2300

Laboratory Job ID: 410-13599-1
Client Project/Site: PES UDEX GW Sampling

For:
Stantec Consulting Corp.
1060 Andrew Drive
Suite 140
West Chester, Pennsylvania 19380

Attn: Andrew Klingbeil

Authorized for release by:
9/22/2020 11:27:03 AM

Amek Carter, Project Manager
(717)556-7252
amekcarter@eurofinsus.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

* QC recoveries that exceed the upper limits and are associated with non-detect samples are qualified but no further narration is needed since the bias is high and does not change a non-detect result.

* Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.

* Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

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Amek Carter
Project Manager
9/22/2020 11:27:03 AM

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Definitions/Glossary

Client: Stantec Consulting Corp.
Project/Site: PES UDEX GW Sampling

Job ID: 410-13599-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
^c	CCV Recovery is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 410-13599-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Narrative

Job Narrative
410-13599-1

Receipt
The samples were received on 9/10/2020 4:48 PM; the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 4.1°C

GC/MS VOA
Method 8260C: The continuing calibration verification (CCV) associated with batch 410-43321 recovered above the upper control limit for Chloromethane. Non-detections of the affected analytes are reported. Any detections are considered estimated.

Method 8260C: The method requirement for no headspace was not met. The following volatile sample was analyzed with headspace in the sample container(s): BF-106_20200910 (410-13599-9). The sample container was received with headspace.

Method 8260C: The following volatiles sample was diluted due to foaming at the time of purging during the original sample analysis: BF-106_20200910 (410-13599-9). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: Stantec Consulting Corp.
Project/Site: PES UDEX GW Sampling

Job ID: 410-13599-1

Client Sample ID: S-383_20200909 — Lab Sample ID: 410-13599-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Toluene	0.59	J	1.0	0.20	ug/L	1		8260C	Total/NA
Acetone	4.6	J	20	0.70	ug/L	1		8260C	Total/NA
Carbon disulfide	1.1	J	5.0	0.20	ug/L	1		8260C	Total/NA
2-Butanone	0.66	J	10	0.30	ug/L	1		8260C	Total/NA
Isopropylbenzene	0.63	J	5.0	0.20	ug/L	1		8260C	Total/NA

Client Sample ID: TB_20200909 — Lab Sample ID: 410-13599-2

No Detections.

Client Sample ID: S-412_20200909 — Lab Sample ID: 410-13599-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Methylcyclohexane	160		5.0	0.50	ug/L	1		8260C	Total/NA
Methyl tertiary butyl ether	0.28	J	1.0	0.20	ug/L	1		8260C	Total/NA
Acetone	4.6	J	20	0.70	ug/L	1		8260C	Total/NA
Isopropylbenzene	12		5.0	0.20	ug/L	1		8260C	Total/NA

Client Sample ID: S-433_20200909 — Lab Sample ID: 410-13599-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	1.9	J	20	0.70	ug/L	1		8260C	Total/NA
Benzene	0.53	J	1.0	0.20	ug/L	1		8260C	Total/NA

Client Sample ID: S-435_20200909 — Lab Sample ID: 410-13599-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
4-Methyl-2-pentanone	0.58	J	10	0.50	ug/L	1		8260C	Total/NA
Acetone	1.8	J	20	0.70	ug/L	1		8260C	Total/NA
Benzene	0.63	J	1.0	0.20	ug/L	1		8260C	Total/NA

Client Sample ID: S-434_20200909 — Lab Sample ID: 410-13599-6

No Detections.

Client Sample ID: C-174_20200909 — Lab Sample ID: 410-13599-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	0.99	J	20	0.70	ug/L	1		8260C	Total/NA

Client Sample ID: S-436_20200910 — Lab Sample ID: 410-13599-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dichlorobenzene	2.0	J	5.0	0.20	ug/L	1		8260C	Total/NA
Chlorobenzene	0.28	J	1.0	0.20	ug/L	1		8260C	Total/NA
1,3-Dichlorobenzene	0.51	J	5.0	0.20	ug/L	1		8260C	Total/NA
Acetone	2.0	J	20	0.70	ug/L	1		8260C	Total/NA
Isopropylbenzene	0.20	J	5.0	0.20	ug/L	1		8260C	Total/NA

Client Sample ID: BF-106_20200910 — Lab Sample ID: 410-13599-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ethylbenzene	5.1	J	10	4.0	ug/L	10		8260C	Total/NA
Methylcyclohexane	220		50	5.0	ug/L	10		8260C	Total/NA
Toluene	2.3	J	10	2.0	ug/L	10		8260C	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Lancaster Laboratories Env, LLC

Client Sample ID: BF-106_20200910 (Continued)

Lab Sample ID: 410-13599-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cyclohexane	190		50	10	ug/L	10		8260C	Total/NA
Acetone	17	J	200	7.0	ug/L	10		8260C	Total/NA
Benzene	20		10	2.0	ug/L	10		8260C	Total/NA
Isopropylbenzene	33	J	50	2.0	ug/L	10		8260C	Total/NA

Client Sample ID: BF-99_20200910

Lab Sample ID: 410-13599-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Methylcyclohexane	81		5.0	0.50	ug/L	1		8260C	Total/NA
Toluene	0.57	J	1.0	0.20	ug/L	1		8260C	Total/NA
Cyclohexane	8.6		5.0	1.0	ug/L	1		8260C	Total/NA
Acetone	14	J	20	0.70	ug/L	1		8260C	Total/NA
Isopropylbenzene	11		5.0	0.20	ug/L	1		8260C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: S-383_20200909
Date Collected: 09/09/20 09:30
Date Received: 09/10/20 16:48

Lab Sample ID: 410-13599-1
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/21/20 14:43	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/21/20 14:43	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/21/20 14:43	1
Styrene	ND		5.0	0.20	ug/L			09/21/20 14:43	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 14:43	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/21/20 14:43	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/21/20 14:43	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/21/20 14:43	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/21/20 14:43	1
Toluene	**0.59**	**J**	1.0	0.20	ug/L			09/21/20 14:43	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/21/20 14:43	1
Cyclohexane	ND		5.0	1.0	ug/L			09/21/20 14:43	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/21/20 14:43	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/21/20 14:43	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/21/20 14:43	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/21/20 14:43	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/21/20 14:43	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/21/20 14:43	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/21/20 14:43	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 14:43	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/21/20 14:43	1
2-Hexanone	ND		10	0.30	ug/L			09/21/20 14:43	1
Acetone	**4.6**	**J**	20	0.70	ug/L			09/21/20 14:43	1
Chloroform	ND		1.0	0.20	ug/L			09/21/20 14:43	1
Benzene	ND		1.0	0.20	ug/L			09/21/20 14:43	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/21/20 14:43	1
Bromomethane	ND		1.0	0.30	ug/L			09/21/20 14:43	1
Chloromethane	ND		1.0	0.20	ug/L			09/21/20 14:43	1
Chloroethane	ND		1.0	0.20	ug/L			09/21/20 14:43	1
Vinyl chloride	ND		1.0	0.20	ug/L			09/21/20 14:43	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/21/20 14:43	1
Carbon disulfide	**1.1**	**J**	5.0	0.20	ug/L			09/21/20 14:43	1
Bromoform	ND		4.0	1.0	ug/L			09/21/20 14:43	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/21/20 14:43	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/21/20 14:43	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/21/20 14:43	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/21/20 14:43	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/21/20 14:43	1
Freon 113	ND		10	0.20	ug/L			09/21/20 14:43	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/21/20 14:43	1
2-Butanone	**0.66**	**J**	10	0.30	ug/L			09/21/20 14:43	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/21/20 14:43	1
Trichloroethene	ND		1.0	0.20	ug/L			09/21/20 14:43	1
Methyl acetate	ND		5.0	0.30	ug/L			09/21/20 14:43	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/21/20 14:43	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 14:43	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/21/20 14:43	1
Isopropylbenzene	**0.63**	**J**	5.0	0.20	ug/L			09/21/20 14:43	1

Client Sample ID: S-383_20200909

Date Collected: 09/09/20 09:30
Date Received: 09/10/20 16:48

Lab Sample ID: 410-13599-1
Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 120*		*09/21/20 14:43*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*09/21/20 14:43*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*09/21/20 14:43*	*1*
Toluene-d8 (Surr)	*97*		*80 - 120*		*09/21/20 14:43*	*1*

Client Sample ID: TB_20200909

Date Collected: 08/30/20 00:00
Date Received: 09/10/20 16:48

Lab Sample ID: 410-13599-2
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/13/20 20:34	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/13/20 20:34	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/13/20 20:34	1
Styrene	ND		5.0	0.20	ug/L			09/13/20 20:34	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/13/20 20:34	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/13/20 20:34	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/13/20 20:34	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/13/20 20:34	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/13/20 20:34	1
Toluene	ND		1.0	0.20	ug/L			09/13/20 20:34	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/13/20 20:34	1
Cyclohexane	ND		5.0	1.0	ug/L			09/13/20 20:34	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/13/20 20:34	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/13/20 20:34	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/13/20 20:34	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/13/20 20:34	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/13/20 20:34	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/13/20 20:34	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/13/20 20:34	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/13/20 20:34	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/13/20 20:34	1
2-Hexanone	ND		10	0.30	ug/L			09/13/20 20:34	1
Acetone	ND		20	0.70	ug/L			09/13/20 20:34	1
Chloroform	ND		1.0	0.20	ug/L			09/13/20 20:34	1
Benzene	ND		1.0	0.20	ug/L			09/13/20 20:34	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/13/20 20:34	1
Bromomethane	ND		1.0	0.30	ug/L			09/13/20 20:34	1
Chloromethane	ND	^c	1.0	0.20	ug/L			09/13/20 20:34	1
Chloroethane	ND		1.0	0.20	ug/L			09/13/20 20:34	1
Vinyl chloride	ND		1.0	0.20	ug/L			09/13/20 20:34	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/13/20 20:34	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/13/20 20:34	1
Bromoform	ND		4.0	1.0	ug/L			09/13/20 20:34	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/13/20 20:34	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/13/20 20:34	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/13/20 20:34	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/13/20 20:34	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/13/20 20:34	1
Freon 113	ND		10	0.20	ug/L			09/13/20 20:34	1

Client Sample ID: TB_20200909

Lab Sample ID: 410-13599-2

Date Collected: 08/30/20 00:00

Matrix: Water

Date Received: 09/10/20 16:48

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/13/20 20:34	1
2-Butanone	ND		10	0.30	ug/L			09/13/20 20:34	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/13/20 20:34	1
Trichloroethene	ND		1.0	0.20	ug/L			09/13/20 20:34	1
Methyl acetate	ND		5.0	0.30	ug/L			09/13/20 20:34	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/13/20 20:34	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/13/20 20:34	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/13/20 20:34	1
Isopropylbenzene	ND		5.0	0.20	ug/L			09/13/20 20:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*80 - 120*		*09/13/20 20:34*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 120*		*09/13/20 20:34*	*1*
4-Bromofluorobenzene (Surr)	*93*		*80 - 120*		*09/13/20 20:34*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*09/13/20 20:34*	*1*

Client Sample ID: S-412_20200909

Lab Sample ID: 410-13599-3

Date Collected: 09/09/20 10:10

Matrix: Water

Date Received: 09/10/20 16:48

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/21/20 18:51	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/21/20 18:51	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/21/20 18:51	1
Styrene	ND		5.0	0.20	ug/L			09/21/20 18:51	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 18:51	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/21/20 18:51	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/21/20 18:51	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/21/20 18:51	1
Methylcyclohexane	**160**		5.0	0.50	ug/L			09/21/20 18:51	1
Toluene	ND		1.0	0.20	ug/L			09/21/20 18:51	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/21/20 18:51	1
Cyclohexane	ND		5.0	1.0	ug/L			09/21/20 18:51	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/21/20 18:51	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/21/20 18:51	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/21/20 18:51	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/21/20 18:51	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/21/20 18:51	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/21/20 18:51	1
Methyl tertiary butyl ether	**0.28**	**J**	1.0	0.20	ug/L			09/21/20 18:51	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 18:51	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/21/20 18:51	1
2-Hexanone	ND		10	0.30	ug/L			09/21/20 18:51	1
Acetone	**4.6**	**J**	20	0.70	ug/L			09/21/20 18:51	1
Chloroform	ND		1.0	0.20	ug/L			09/21/20 18:51	1
Benzene	ND		1.0	0.20	ug/L			09/21/20 18:51	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/21/20 18:51	1
Bromomethane	ND		1.0	0.30	ug/L			09/21/20 18:51	1
Chloromethane	ND		1.0	0.20	ug/L			09/21/20 18:51	1

Client Sample ID: S-412_20200909

Date Collected: 09/09/20 10:10
Date Received: 09/10/20 16:48

Lab Sample ID: 410-13599-3

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		1.0	0.20	ug/L			09/21/20 18:51	1
Vinyl chloride	ND		1.0	0.20	ug/L			09/21/20 18:51	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/21/20 18:51	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/21/20 18:51	1
Bromoform	ND		4.0	1.0	ug/L			09/21/20 18:51	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/21/20 18:51	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/21/20 18:51	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/21/20 18:51	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/21/20 18:51	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/21/20 18:51	1
Freon 113	ND		10	0.20	ug/L			09/21/20 18:51	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/21/20 18:51	1
2-Butanone	ND		10	0.30	ug/L			09/21/20 18:51	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/21/20 18:51	1
Trichloroethene	ND		1.0	0.20	ug/L			09/21/20 18:51	1
Methyl acetate	ND		5.0	0.30	ug/L			09/21/20 18:51	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/21/20 18:51	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 18:51	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/21/20 18:51	1
Isopropylbenzene	**12**		5.0	0.20	ug/L			09/21/20 18:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*80 - 120*		*09/21/20 18:51*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*09/21/20 18:51*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*09/21/20 18:51*	*1*
Toluene-d8 (Surr)	*103*		*80 - 120*		*09/21/20 18:51*	*1*

Client Sample ID: S-433_20200909

Date Collected: 09/09/20 11:00
Date Received: 09/10/20 16:48

Lab Sample ID: 410-13599-4

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/21/20 15:05	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/21/20 15:05	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/21/20 15:05	1
Styrene	ND		5.0	0.20	ug/L			09/21/20 15:05	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 15:05	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/21/20 15:05	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/21/20 15:05	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/21/20 15:05	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/21/20 15:05	1
Toluene	ND		1.0	0.20	ug/L			09/21/20 15:05	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/21/20 15:05	1
Cyclohexane	ND		5.0	1.0	ug/L			09/21/20 15:05	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/21/20 15:05	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/21/20 15:05	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/21/20 15:05	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/21/20 15:05	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/21/20 15:05	1

Client Sample ID: S-433_20200909

Lab Sample ID: 410-13599-4

Date Collected: 09/09/20 11:00

Matrix: Water

Date Received: 09/10/20 16:48

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/21/20 15:05	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/21/20 15:05	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 15:05	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/21/20 15:05	1
2-Hexanone	ND		10	0.30	ug/L			09/21/20 15:05	1
Acetone	**1.9**	**J**	20	0.70	ug/L			09/21/20 15:05	1
Chloroform	ND		1.0	0.20	ug/L			09/21/20 15:05	1
Benzene	**0.53**	**J**	1.0	0.20	ug/L			09/21/20 15:05	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/21/20 15:05	1
Bromomethane	ND		1.0	0.30	ug/L			09/21/20 15:05	1
Chloromethane	ND		1.0	0.20	ug/L			09/21/20 15:05	1
Chloroethane	ND		1.0	0.20	ug/L			09/21/20 15:05	1
Vinyl chloride	ND		1.0	0.20	ug/L			09/21/20 15:05	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/21/20 15:05	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/21/20 15:05	1
Bromoform	ND		4.0	1.0	ug/L			09/21/20 15:05	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/21/20 15:05	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/21/20 15:05	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/21/20 15:05	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/21/20 15:05	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/21/20 15:05	1
Freon 113	ND		10	0.20	ug/L			09/21/20 15:05	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/21/20 15:05	1
2-Butanone	ND		10	0.30	ug/L			09/21/20 15:05	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/21/20 15:05	1
Trichloroethene	ND		1.0	0.20	ug/L			09/21/20 15:05	1
Methyl acetate	ND		5.0	0.30	ug/L			09/21/20 15:05	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/21/20 15:05	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 15:05	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/21/20 15:05	1
Isopropylbenzene	ND		5.0	0.20	ug/L			09/21/20 15:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*80 - 120*		*09/21/20 15:05*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*09/21/20 15:05*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*09/21/20 15:05*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*09/21/20 15:05*	*1*

Client Sample ID: S-435_20200909

Lab Sample ID: 410-13599-5

Date Collected: 09/09/20 11:40

Matrix: Water

Date Received: 09/10/20 16:48

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/21/20 15:28	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/21/20 15:28	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/21/20 15:28	1
Styrene	ND		5.0	0.20	ug/L			09/21/20 15:28	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 15:28	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/21/20 15:28	1

Client: Stantec Consulting Corp.
Project/Site: PES UDEX GW Sampling

Job ID: 410-13599-1

Client Sample ID: S-435_20200909
Date Collected: 09/09/20 11:40
Date Received: 09/10/20 16:48

Lab Sample ID: 410-13599-5
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/21/20 15:28	1
4-Methyl-2-pentanone	**0.58**	**J**	10	0.50	ug/L			09/21/20 15:28	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/21/20 15:28	1
Toluene	ND		1.0	0.20	ug/L			09/21/20 15:28	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/21/20 15:28	1
Cyclohexane	ND		5.0	1.0	ug/L			09/21/20 15:28	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/21/20 15:28	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/21/20 15:28	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/21/20 15:28	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/21/20 15:28	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/21/20 15:28	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/21/20 15:28	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/21/20 15:28	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 15:28	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/21/20 15:28	1
2-Hexanone	ND		10	0.30	ug/L			09/21/20 15:28	1
Acetone	**1.8**	**J**	20	0.70	ug/L			09/21/20 15:28	1
Chloroform	ND		1.0	0.20	ug/L			09/21/20 15:28	1
Benzene	**0.63**	**J**	1.0	0.20	ug/L			09/21/20 15:28	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/21/20 15:28	1
Bromomethane	ND		1.0	0.30	ug/L			09/21/20 15:28	1
Chloromethane	ND		1.0	0.20	ug/L			09/21/20 15:28	1
Chloroethane	ND		1.0	0.20	ug/L			09/21/20 15:28	1
Vinyl chloride	ND		1.0	0.20	ug/L			09/21/20 15:28	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/21/20 15:28	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/21/20 15:28	1
Bromoform	ND		4.0	1.0	ug/L			09/21/20 15:28	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/21/20 15:28	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/21/20 15:28	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/21/20 15:28	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/21/20 15:28	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/21/20 15:28	1
Freon 113	ND		10	0.20	ug/L			09/21/20 15:28	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/21/20 15:28	1
2-Butanone	ND		10	0.30	ug/L			09/21/20 15:28	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/21/20 15:28	1
Trichloroethene	ND		1.0	0.20	ug/L			09/21/20 15:28	1
Methyl acetate	ND		5.0	0.30	ug/L			09/21/20 15:28	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/21/20 15:28	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 15:28	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/21/20 15:28	1
Isopropylbenzene	ND		5.0	0.20	ug/L			09/21/20 15:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*		*09/21/20 15:28*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 120*		*09/21/20 15:28*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*09/21/20 15:28*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*09/21/20 15:28*	*1*

Client: Stantec Consulting Corp.
Project/Site: PES UDEX GW Sampling

Job ID: 410-13599-1

Client Sample ID: S-434_20200909
Date Collected: 09/09/20 12:55
Date Received: 09/10/20 16:48

Lab Sample ID: 410-13599-6
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/21/20 15:50	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/21/20 15:50	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/21/20 15:50	1
Styrene	ND		5.0	0.20	ug/L			09/21/20 15:50	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 15:50	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/21/20 15:50	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/21/20 15:50	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/21/20 15:50	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/21/20 15:50	1
Toluene	ND		1.0	0.20	ug/L			09/21/20 15:50	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/21/20 15:50	1
Cyclohexane	ND		5.0	1.0	ug/L			09/21/20 15:50	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/21/20 15:50	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/21/20 15:50	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/21/20 15:50	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/21/20 15:50	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/21/20 15:50	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/21/20 15:50	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/21/20 15:50	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 15:50	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/21/20 15:50	1
2-Hexanone	ND		10	0.30	ug/L			09/21/20 15:50	1
Acetone	ND		20	0.70	ug/L			09/21/20 15:50	1
Chloroform	ND		1.0	0.20	ug/L			09/21/20 15:50	1
Benzene	ND		1.0	0.20	ug/L			09/21/20 15:50	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/21/20 15:50	1
Bromomethane	ND		1.0	0.30	ug/L			09/21/20 15:50	1
Chloromethane	ND		1.0	0.20	ug/L			09/21/20 15:50	1
Chloroethane	ND		1.0	0.20	ug/L			09/21/20 15:50	1
Vinyl chloride	ND		1.0	0.20	ug/L			09/21/20 15:50	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/21/20 15:50	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/21/20 15:50	1
Bromoform	ND		4.0	1.0	ug/L			09/21/20 15:50	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/21/20 15:50	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/21/20 15:50	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/21/20 15:50	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/21/20 15:50	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/21/20 15:50	1
Freon 113	ND		10	0.20	ug/L			09/21/20 15:50	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/21/20 15:50	1
2-Butanone	ND		10	0.30	ug/L			09/21/20 15:50	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/21/20 15:50	1
Trichloroethene	ND		1.0	0.20	ug/L			09/21/20 15:50	1
Methyl acetate	ND		5.0	0.30	ug/L			09/21/20 15:50	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/21/20 15:50	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 15:50	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/21/20 15:50	1
Isopropylbenzene	ND		5.0	0.20	ug/L			09/21/20 15:50	1

Client Sample ID: S-434_20200909

Lab Sample ID: 410-13599-6

Date Collected: 09/09/20 12:55
Matrix: Water
Date Received: 09/10/20 16:48

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*		*09/21/20 15:50*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*09/21/20 15:50*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*09/21/20 15:50*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*09/21/20 15:50*	*1*

Client Sample ID: C-174_20200909

Lab Sample ID: 410-13599-7

Date Collected: 09/09/20 13:50
Matrix: Water
Date Received: 09/10/20 16:48

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/21/20 16:13	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/21/20 16:13	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/21/20 16:13	1
Styrene	ND		5.0	0.20	ug/L			09/21/20 16:13	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 16:13	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/21/20 16:13	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/21/20 16:13	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/21/20 16:13	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/21/20 16:13	1
Toluene	ND		1.0	0.20	ug/L			09/21/20 16:13	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/21/20 16:13	1
Cyclohexane	ND		5.0	1.0	ug/L			09/21/20 16:13	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/21/20 16:13	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/21/20 16:13	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/21/20 16:13	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/21/20 16:13	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/21/20 16:13	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/21/20 16:13	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/21/20 16:13	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 16:13	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/21/20 16:13	1
2-Hexanone	ND		10	0.30	ug/L			09/21/20 16:13	1
Acetone	**0.99**	**J**	20	0.70	ug/L			09/21/20 16:13	1
Chloroform	ND		1.0	0.20	ug/L			09/21/20 16:13	1
Benzene	ND		1.0	0.20	ug/L			09/21/20 16:13	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/21/20 16:13	1
Bromomethane	ND		1.0	0.30	ug/L			09/21/20 16:13	1
Chloromethane	ND		1.0	0.20	ug/L			09/21/20 16:13	1
Chloroethane	ND		1.0	0.20	ug/L			09/21/20 16:13	1
Vinyl chloride	ND		1.0	0.20	ug/L			09/21/20 16:13	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/21/20 16:13	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/21/20 16:13	1
Bromoform	ND		4.0	1.0	ug/L			09/21/20 16:13	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/21/20 16:13	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/21/20 16:13	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/21/20 16:13	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/21/20 16:13	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/21/20 16:13	1
Freon 113	ND		10	0.20	ug/L			09/21/20 16:13	1

Client Sample ID: C-174_20200909

Lab Sample ID: 410-13599-7

Date Collected: 09/09/20 13:50
Date Received: 09/10/20 16:48

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/21/20 16:13	1
2-Butanone	ND		10	0.30	ug/L			09/21/20 16:13	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/21/20 16:13	1
Trichloroethene	ND		1.0	0.20	ug/L			09/21/20 16:13	1
Methyl acetate	ND		5.0	0.30	ug/L			09/21/20 16:13	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/21/20 16:13	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 16:13	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/21/20 16:13	1
Isopropylbenzene	ND		5.0	0.20	ug/L			09/21/20 16:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*		*09/21/20 16:13*	*1*
Dibromofluoromethane (Surr)	*102*		*80 - 120*		*09/21/20 16:13*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*09/21/20 16:13*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*09/21/20 16:13*	*1*

Client Sample ID: S-436_20200910

Lab Sample ID: 410-13599-8

Date Collected: 09/10/20 08:55
Date Received: 09/10/20 16:48

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/21/20 16:36	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/21/20 16:36	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/21/20 16:36	1
Styrene	ND		5.0	0.20	ug/L			09/21/20 16:36	1
1,4-Dichlorobenzene	**2.0**	**J**	5.0	0.20	ug/L			09/21/20 16:36	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/21/20 16:36	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/21/20 16:36	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/21/20 16:36	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/21/20 16:36	1
Toluene	ND		1.0	0.20	ug/L			09/21/20 16:36	1
Chlorobenzene	**0.28**	**J**	1.0	0.20	ug/L			09/21/20 16:36	1
Cyclohexane	ND		5.0	1.0	ug/L			09/21/20 16:36	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/21/20 16:36	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/21/20 16:36	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/21/20 16:36	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/21/20 16:36	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/21/20 16:36	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/21/20 16:36	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/21/20 16:36	1
1,3-Dichlorobenzene	**0.51**	**J**	5.0	0.20	ug/L			09/21/20 16:36	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/21/20 16:36	1
2-Hexanone	ND		10	0.30	ug/L			09/21/20 16:36	1
Acetone	**2.0**	**J**	20	0.70	ug/L			09/21/20 16:36	1
Chloroform	ND		1.0	0.20	ug/L			09/21/20 16:36	1
Benzene	ND		1.0	0.20	ug/L			09/21/20 16:36	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/21/20 16:36	1
Bromomethane	ND		1.0	0.30	ug/L			09/21/20 16:36	1
Chloromethane	ND		1.0	0.20	ug/L			09/21/20 16:36	1

Client Sample ID: S-436_20200910

Date Collected: 09/10/20 08:55
Date Received: 09/10/20 16:48

Lab Sample ID: 410-13599-8
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		1.0	0.20	ug/L			09/21/20 16:36	1
Vinyl chloride	ND		1.0	0.20	ug/L			09/21/20 16:36	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/21/20 16:36	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/21/20 16:36	1
Bromoform	ND		4.0	1.0	ug/L			09/21/20 16:36	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/21/20 16:36	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/21/20 16:36	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/21/20 16:36	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/21/20 16:36	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/21/20 16:36	1
Freon 113	ND		10	0.20	ug/L			09/21/20 16:36	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/21/20 16:36	1
2-Butanone	ND		10	0.30	ug/L			09/21/20 16:36	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/21/20 16:36	1
Trichloroethene	ND		1.0	0.20	ug/L			09/21/20 16:36	1
Methyl acetate	ND		5.0	0.30	ug/L			09/21/20 16:36	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/21/20 16:36	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 16:36	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/21/20 16:36	1
Isopropylbenzene	**0.20**	**J**	5.0	0.20	ug/L			09/21/20 16:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*80 - 120*		*09/21/20 16:36*	*1*
Dibromofluoromethane (Surr)	*102*		*80 - 120*		*09/21/20 16:36*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*09/21/20 16:36*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*09/21/20 16:36*	*1*

Client Sample ID: BF-106_20200910

Date Collected: 09/10/20 10:20
Date Received: 09/10/20 16:48

Lab Sample ID: 410-13599-9
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		10	2.0	ug/L			09/21/20 18:29	10
trans-1,3-Dichloropropene	ND		10	2.0	ug/L			09/21/20 18:29	10
Ethylbenzene	**5.1**	**J**	10	4.0	ug/L			09/21/20 18:29	10
Styrene	ND		50	2.0	ug/L			09/21/20 18:29	10
1,4-Dichlorobenzene	ND		50	2.0	ug/L			09/21/20 18:29	10
1,2-Dibromoethane	ND		10	2.0	ug/L			09/21/20 18:29	10
1,2-Dichloroethane	ND		10	3.0	ug/L			09/21/20 18:29	10
4-Methyl-2-pentanone	ND		100	5.0	ug/L			09/21/20 18:29	10
Methylcyclohexane	**220**		50	5.0	ug/L			09/21/20 18:29	10
Toluene	**2.3**	**J**	10	2.0	ug/L			09/21/20 18:29	10
Chlorobenzene	ND		10	2.0	ug/L			09/21/20 18:29	10
Cyclohexane	**190**		50	10	ug/L			09/21/20 18:29	10
1,2,4-Trichlorobenzene	ND		50	3.0	ug/L			09/21/20 18:29	10
Dibromochloromethane	ND		10	2.0	ug/L			09/21/20 18:29	10
Xylenes, Total	ND		60	14	ug/L			09/21/20 18:29	10
Tetrachloroethene	ND		10	2.0	ug/L			09/21/20 18:29	10
cis-1,2-Dichloroethene	ND		10	2.0	ug/L			09/21/20 18:29	10

Client Sample ID: BF-106_20200910

Lab Sample ID: 410-13599-9

Date Collected: 09/10/20 10:20
Matrix: Water
Date Received: 09/10/20 16:48

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,2-Dichloroethene	ND		50	2.0	ug/L			09/21/20 18:29	10
Methyl tertiary butyl ether	ND		10	2.0	ug/L			09/21/20 18:29	10
1,3-Dichlorobenzene	ND		50	2.0	ug/L			09/21/20 18:29	10
Carbon tetrachloride	ND		10	2.0	ug/L			09/21/20 18:29	10
2-Hexanone	ND		100	3.0	ug/L			09/21/20 18:29	10
Acetone	**17**	**J**	200	7.0	ug/L			09/21/20 18:29	10
Chloroform	ND		10	2.0	ug/L			09/21/20 18:29	10
Benzene	**20**		10	2.0	ug/L			09/21/20 18:29	10
1,1,1-Trichloroethane	ND		10	3.0	ug/L			09/21/20 18:29	10
Bromomethane	ND		10	3.0	ug/L			09/21/20 18:29	10
Chloromethane	ND		10	2.0	ug/L			09/21/20 18:29	10
Chloroethane	ND		10	2.0	ug/L			09/21/20 18:29	10
Vinyl chloride	ND		10	2.0	ug/L			09/21/20 18:29	10
Methylene Chloride	ND		10	3.0	ug/L			09/21/20 18:29	10
Carbon disulfide	ND		50	2.0	ug/L			09/21/20 18:29	10
Bromoform	ND		40	10	ug/L			09/21/20 18:29	10
Bromodichloromethane	ND		10	2.0	ug/L			09/21/20 18:29	10
1,1-Dichloroethane	ND		10	2.0	ug/L			09/21/20 18:29	10
1,1-Dichloroethene	ND		10	2.0	ug/L			09/21/20 18:29	10
Trichlorofluoromethane	ND		10	2.0	ug/L			09/21/20 18:29	10
Dichlorodifluoromethane	ND		10	2.0	ug/L			09/21/20 18:29	10
Freon 113	ND		100	2.0	ug/L			09/21/20 18:29	10
1,2-Dichloropropane	ND		10	2.0	ug/L			09/21/20 18:29	10
2-Butanone	ND		100	3.0	ug/L			09/21/20 18:29	10
1,1,2-Trichloroethane	ND		10	2.0	ug/L			09/21/20 18:29	10
Trichloroethene	ND		10	2.0	ug/L			09/21/20 18:29	10
Methyl acetate	ND		50	3.0	ug/L			09/21/20 18:29	10
1,1,2,2-Tetrachloroethane	ND		10	2.0	ug/L			09/21/20 18:29	10
1,2-Dichlorobenzene	ND		50	2.0	ug/L			09/21/20 18:29	10
1,2-Dibromo-3-Chloropropane	ND		50	3.0	ug/L			09/21/20 18:29	10
Isopropylbenzene	**33**	**J**	50	2.0	ug/L			09/21/20 18:29	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 120*		*09/21/20 18:29*	*10*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*09/21/20 18:29*	*10*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*09/21/20 18:29*	*10*
Toluene-d8 (Surr)	*98*		*80 - 120*		*09/21/20 18:29*	*10*

Client Sample ID: BF-99_20200910

Lab Sample ID: 410-13599-10

Date Collected: 09/10/20 11:00
Matrix: Water
Date Received: 09/10/20 16:48

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/21/20 16:58	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/21/20 16:58	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/21/20 16:58	1
Styrene	ND		5.0	0.20	ug/L			09/21/20 16:58	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 16:58	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/21/20 16:58	1

Client: Stantec Consulting Corp.
Project/Site: PES UDEX GW Sampling

Job ID: 410-13599-1

Client Sample ID: BF-99_20200910
Date Collected: 09/10/20 11:00
Date Received: 09/10/20 16:48

Lab Sample ID: 410-13599-10
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/21/20 16:58	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/21/20 16:58	1
Methylcyclohexane	**81**		5.0	0.50	ug/L			09/21/20 16:58	1
Toluene	**0.57**	**J**	1.0	0.20	ug/L			09/21/20 16:58	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/21/20 16:58	1
Cyclohexane	**8.6**		5.0	1.0	ug/L			09/21/20 16:58	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/21/20 16:58	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/21/20 16:58	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/21/20 16:58	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/21/20 16:58	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/21/20 16:58	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/21/20 16:58	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/21/20 16:58	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 16:58	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/21/20 16:58	1
2-Hexanone	ND		10	0.30	ug/L			09/21/20 16:58	1
Acetone	**14**	**J**	20	0.70	ug/L			09/21/20 16:58	1
Chloroform	ND		1.0	0.20	ug/L			09/21/20 16:58	1
Benzene	ND		1.0	0.20	ug/L			09/21/20 16:58	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/21/20 16:58	1
Bromomethane	ND		1.0	0.30	ug/L			09/21/20 16:58	1
Chloromethane	ND		1.0	0.20	ug/L			09/21/20 16:58	1
Chloroethane	ND		1.0	0.20	ug/L			09/21/20 16:58	1
Vinyl chloride	ND		1.0	0.20	ug/L			09/21/20 16:58	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/21/20 16:58	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/21/20 16:58	1
Bromoform	ND		4.0	1.0	ug/L			09/21/20 16:58	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/21/20 16:58	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/21/20 16:58	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/21/20 16:58	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/21/20 16:58	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/21/20 16:58	1
Freon 113	ND		10	0.20	ug/L			09/21/20 16:58	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/21/20 16:58	1
2-Butanone	ND		10	0.30	ug/L			09/21/20 16:58	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/21/20 16:58	1
Trichloroethene	ND		1.0	0.20	ug/L			09/21/20 16:58	1
Methyl acetate	ND		5.0	0.30	ug/L			09/21/20 16:58	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/21/20 16:58	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 16:58	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/21/20 16:58	1
Isopropylbenzene	**11**		5.0	0.20	ug/L			09/21/20 16:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*80 - 120*		*09/21/20 16:58*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*09/21/20 16:58*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*09/21/20 16:58*	*1*
Toluene-d8 (Surr)	*100*		*80 - 120*		*09/21/20 16:58*	*1*

Surrogate Summary

Client: Stantec Consulting Corp.
Project/Site: PES UDEX GW Sampling

Job ID: 410-13599-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	DBFM	BFB	TOL
Lab Sample ID	Client Sample ID	(80-120)	(80-120)	(80-120)	(80-120)
410-13599-1	S-383_20200909	102	101	99	97
410-13599-2	TB_20200909	95	94	93	98
410-13599-3	S-412_20200909	97	101	99	103
410-13599-4	S-433_20200909	98	101	100	98
410-13599-5	S-435_20200909	101	100	99	98
410-13599-6	S-434_20200909	101	101	99	98
410-13599-7	C-174_20200909	101	102	99	98
410-13599-8	S-436_20200910	98	102	99	98
410-13599-9	BF-106_20200910	100	101	100	98
410-13599-10	BF-99_20200910	99	101	98	100
LCS 410-43321/4	Lab Control Sample	96	93	95	99
LCS 410-45858/5	Lab Control Sample	99	100	99	99
LCSD 410-43321/5	Lab Control Sample Dup	97	93	95	99
LCSD 410-45858/7	Lab Control Sample Dup	100	102	100	99
MB 410-43321/7	Method Blank	96	93	93	98
MB 410-45858/9	Method Blank	101	101	99	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
DBFM = Dibromofluoromethane (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 410-43321/7
Matrix: Water
Analysis Batch: 43321

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/13/20 20:01	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/13/20 20:01	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/13/20 20:01	1
Styrene	ND		5.0	0.20	ug/L			09/13/20 20:01	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/13/20 20:01	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/13/20 20:01	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/13/20 20:01	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/13/20 20:01	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/13/20 20:01	1
Toluene	ND		1.0	0.20	ug/L			09/13/20 20:01	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/13/20 20:01	1
Cyclohexane	ND		5.0	1.0	ug/L			09/13/20 20:01	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/13/20 20:01	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/13/20 20:01	1
Xylenes, Total	ND		6.0	1.4	ug/L			09/13/20 20:01	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/13/20 20:01	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/13/20 20:01	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/13/20 20:01	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/13/20 20:01	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/13/20 20:01	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/13/20 20:01	1
2-Hexanone	ND		10	0.30	ug/L			09/13/20 20:01	1
Acetone	ND		20	0.70	ug/L			09/13/20 20:01	1
Chloroform	ND		1.0	0.20	ug/L			09/13/20 20:01	1
Benzene	ND		1.0	0.20	ug/L			09/13/20 20:01	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/13/20 20:01	1
Bromomethane	ND		1.0	0.30	ug/L			09/13/20 20:01	1
Chloromethane	ND		1.0	0.20	ug/L			09/13/20 20:01	1
Chloroethane	ND		1.0	0.20	ug/L			09/13/20 20:01	1
Vinyl chloride	ND		1.0	0.20	ug/L			09/13/20 20:01	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/13/20 20:01	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/13/20 20:01	1
Bromoform	ND		4.0	1.0	ug/L			09/13/20 20:01	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/13/20 20:01	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/13/20 20:01	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/13/20 20:01	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/13/20 20:01	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/13/20 20:01	1
Freon 113	ND		10	0.20	ug/L			09/13/20 20:01	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/13/20 20:01	1
2-Butanone	ND		10	0.30	ug/L			09/13/20 20:01	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/13/20 20:01	1
Trichloroethene	ND		1.0	0.20	ug/L			09/13/20 20:01	1
Methyl acetate	ND		5.0	0.30	ug/L			09/13/20 20:01	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/13/20 20:01	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/13/20 20:01	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/13/20 20:01	1
Isopropylbenzene	ND		5.0	0.20	ug/L			09/13/20 20:01	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-43321/7
Matrix: Water
Analysis Batch: 43321

Client Sample ID: Method Blank
Prep Type: Total/NA

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*96*		*80 - 120*		*09/13/20 20:01*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 120*		*09/13/20 20:01*	*1*
4-Bromofluorobenzene (Surr)	*93*		*80 - 120*		*09/13/20 20:01*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*09/13/20 20:01*	*1*

Lab Sample ID: LCS 410-43321/4
Matrix: Water
Analysis Batch: 43321

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,3-Dichloropropene	20.0	19.6		ug/L		98	75 - 120
trans-1,3-Dichloropropene	20.0	19.5		ug/L		97	67 - 120
Ethylbenzene	20.0	20.9		ug/L		105	80 - 120
Styrene	20.0	20.6		ug/L		103	80 - 120
1,4-Dichlorobenzene	20.0	20.8		ug/L		104	80 - 120
1,2-Dibromoethane	20.0	19.9		ug/L		99	77 - 120
1,2-Dichloroethane	20.0	17.2		ug/L		86	73 - 124
4-Methyl-2-pentanone	100	96.6		ug/L		97	62 - 133
Methylcyclohexane	20.0	17.7		ug/L		88	67 - 121
Toluene	20.0	20.6		ug/L		103	80 - 120
Chlorobenzene	20.0	20.9		ug/L		105	80 - 120
Cyclohexane	20.0	18.5		ug/L		93	68 - 126
1,2,4-Trichlorobenzene	20.0	20.4		ug/L		102	63 - 120
Dibromochloromethane	20.0	20.5		ug/L		102	71 - 120
Xylenes, Total	60.0	61.9		ug/L		103	80 - 120
Tetrachloroethene	20.0	19.5		ug/L		98	80 - 120
cis-1,2-Dichloroethene	20.0	21.3		ug/L		107	80 - 125
trans-1,2-Dichloroethene	20.0	19.8		ug/L		99	80 - 126
Methyl tertiary butyl ether	20.0	19.6		ug/L		98	69 - 122
1,3-Dichlorobenzene	20.0	20.2		ug/L		101	80 - 120
Carbon tetrachloride	20.0	18.1		ug/L		91	64 - 134
2-Hexanone	100	99.1		ug/L		99	56 - 135
Acetone	150	130		ug/L		87	54 - 157
Chloroform	20.0	19.4		ug/L		97	80 - 120
Benzene	20.0	20.6		ug/L		103	80 - 120
1,1,1-Trichloroethane	20.0	18.4		ug/L		92	67 - 126
Bromomethane	20.0	16.5		ug/L		83	53 - 128
Chloromethane	20.0	22.4		ug/L		112	56 - 121
Chloroethane	20.0	18.4		ug/L		92	55 - 123
Vinyl chloride	20.0	20.7		ug/L		104	56 - 120
Methylene Chloride	20.0	18.6		ug/L		93	80 - 120
Carbon disulfide	20.0	19.0		ug/L		95	65 - 128
Bromoform	20.0	21.8		ug/L		109	51 - 120
Bromodichloromethane	20.0	19.5		ug/L		97	71 - 120
1,1-Dichloroethane	20.0	19.5		ug/L		97	80 - 120
1,1-Dichloroethene	20.0	19.7		ug/L		99	80 - 131
Trichlorofluoromethane	20.0	16.8		ug/L		84	55 - 135
Dichlorodifluoromethane	20.0	16.7		ug/L		83	41 - 127

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-43321/4
Matrix: Water
Analysis Batch: 43321

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Freon 113			20.0	15.9		ug/L		80	73 - 139		
1,2-Dichloropropane			20.0	20.7		ug/L		103	80 - 120		
2-Butanone			150	148		ug/L		99	59 - 135		
1,1,2-Trichloroethane			20.0	20.9		ug/L		104	80 - 120		
Trichloroethene			20.0	19.4		ug/L		97	80 - 120		
Methyl acetate			20.0	20.3		ug/L		101	54 - 136		
1,1,2,2-Tetrachloroethane			20.0	21.2		ug/L		106	72 - 120		
1,2-Dichlorobenzene			20.0	20.5		ug/L		103	80 - 120		
1,2-Dibromo-3-Chloropropane			20.0	20.5		ug/L		102	47 - 131		
Isopropylbenzene			20.0	21.0		ug/L		105	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*80 - 120*
Dibromofluoromethane (Surr)	*93*		*80 - 120*
4-Bromofluorobenzene (Surr)	*95*		*80 - 120*
Toluene-d8 (Surr)	*99*		*80 - 120*

Lab Sample ID: LCSD 410-43321/5
Matrix: Water
Analysis Batch: 43321

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,3-Dichloropropene			20.0	20.0		ug/L		100	75 - 120	2	30
trans-1,3-Dichloropropene			20.0	19.6		ug/L		98	67 - 120	1	30
Ethylbenzene			20.0	20.6		ug/L		103	80 - 120	1	30
Styrene			20.0	20.6		ug/L		103	80 - 120	0	30
1,4-Dichlorobenzene			20.0	20.6		ug/L		103	80 - 120	1	30
1,2-Dibromoethane			20.0	19.7		ug/L		98	77 - 120	1	30
1,2-Dichloroethane			20.0	17.5		ug/L		88	73 - 124	2	30
4-Methyl-2-pentanone			100	93.9		ug/L		94	62 - 133	3	30
Methylcyclohexane			20.0	17.9		ug/L		89	67 - 121	1	30
Toluene			20.0	20.7		ug/L		103	80 - 120	0	30
Chlorobenzene			20.0	20.8		ug/L		104	80 - 120	1	30
Cyclohexane			20.0	18.2		ug/L		91	68 - 126	2	30
1,2,4-Trichlorobenzene			20.0	20.6		ug/L		103	63 - 120	1	30
Dibromochloromethane			20.0	20.7		ug/L		103	71 - 120	1	30
Xylenes, Total			60.0	61.1		ug/L		102	80 - 120	1	30
Tetrachloroethene			20.0	18.7		ug/L		93	80 - 120	4	30
cis-1,2-Dichloroethene			20.0	21.2		ug/L		106	80 - 125	1	30
trans-1,2-Dichloroethene			20.0	19.6		ug/L		98	80 - 126	1	30
Methyl tertiary butyl ether			20.0	19.5		ug/L		97	69 - 122	0	30
1,3-Dichlorobenzene			20.0	20.4		ug/L		102	80 - 120	1	30
Carbon tetrachloride			20.0	18.1		ug/L		91	64 - 134	0	30
2-Hexanone			100	97.0		ug/L		97	56 - 135	2	30
Acetone			150	137		ug/L		91	54 - 157	5	30
Chloroform			20.0	19.3		ug/L		96	80 - 120	1	30
Benzene			20.0	20.6		ug/L		103	80 - 120	0	30
1,1,1-Trichloroethane			20.0	18.1		ug/L		91	67 - 126	1	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-43321/5
Matrix: Water
Analysis Batch: 43321

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bromomethane			20.0	16.7		ug/L		83	53 - 128	1	30
Chloromethane			20.0	22.0		ug/L		110	56 - 121	2	30
Chloroethane			20.0	18.1		ug/L		90	55 - 123	2	30
Vinyl chloride			20.0	20.6		ug/L		103	56 - 120	1	30
Methylene Chloride			20.0	18.8		ug/L		94	80 - 120	1	30
Carbon disulfide			20.0	18.6		ug/L		93	65 - 128	2	30
Bromoform			20.0	21.5		ug/L		107	51 - 120	1	30
Bromodichloromethane			20.0	19.7		ug/L		98	71 - 120	1	30
1,1-Dichloroethane			20.0	19.3		ug/L		97	80 - 120	1	30
1,1-Dichloroethene			20.0	19.5		ug/L		97	80 - 131	1	30
Trichlorofluoromethane			20.0	16.4		ug/L		82	55 - 135	2	30
Dichlorodifluoromethane			20.0	16.3		ug/L		82	41 - 127	2	30
Freon 113			20.0	15.7		ug/L		79	73 - 139	1	30
1,2-Dichloropropane			20.0	20.8		ug/L		104	80 - 120	1	30
2-Butanone			150	142		ug/L		95	59 - 135	4	30
1,1,2-Trichloroethane			20.0	20.8		ug/L		104	80 - 120	1	30
Trichloroethene			20.0	19.2		ug/L		96	80 - 120	1	30
Methyl acetate			20.0	20.3		ug/L		101	54 - 136	0	30
1,1,2,2-Tetrachloroethane			20.0	21.1		ug/L		105	72 - 120	1	30
1,2-Dichlorobenzene			20.0	20.0		ug/L		100	80 - 120	3	30
1,2-Dibromo-3-Chloropropane			20.0	19.8		ug/L		99	47 - 131	3	30
Isopropylbenzene			20.0	20.8		ug/L		104	80 - 120	1	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*80 - 120*
Dibromofluoromethane (Surr)	*93*		*80 - 120*
4-Bromofluorobenzene (Surr)	*95*		*80 - 120*
Toluene-d8 (Surr)	*99*		*80 - 120*

Lab Sample ID: MB 410-45858/9
Matrix: Water
Analysis Batch: 45858

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/21/20 11:37	1
trans-1,3-Dichloropropene	ND		1.0	0.20	ug/L			09/21/20 11:37	1
Ethylbenzene	ND		1.0	0.40	ug/L			09/21/20 11:37	1
Styrene	ND		5.0	0.20	ug/L			09/21/20 11:37	1
1,4-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 11:37	1
1,2-Dibromoethane	ND		1.0	0.20	ug/L			09/21/20 11:37	1
1,2-Dichloroethane	ND		1.0	0.30	ug/L			09/21/20 11:37	1
4-Methyl-2-pentanone	ND		10	0.50	ug/L			09/21/20 11:37	1
Methylcyclohexane	ND		5.0	0.50	ug/L			09/21/20 11:37	1
Toluene	ND		1.0	0.20	ug/L			09/21/20 11:37	1
Chlorobenzene	ND		1.0	0.20	ug/L			09/21/20 11:37	1
Cyclohexane	ND		5.0	1.0	ug/L			09/21/20 11:37	1
1,2,4-Trichlorobenzene	ND		5.0	0.30	ug/L			09/21/20 11:37	1
Dibromochloromethane	ND		1.0	0.20	ug/L			09/21/20 11:37	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-45858/9
Matrix: Water
Analysis Batch: 45858

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Xylenes, Total	ND		6.0	1.4	ug/L			09/21/20 11:37	1
Tetrachloroethene	ND		1.0	0.20	ug/L			09/21/20 11:37	1
cis-1,2-Dichloroethene	ND		1.0	0.20	ug/L			09/21/20 11:37	1
trans-1,2-Dichloroethene	ND		5.0	0.20	ug/L			09/21/20 11:37	1
Methyl tertiary butyl ether	ND		1.0	0.20	ug/L			09/21/20 11:37	1
1,3-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 11:37	1
Carbon tetrachloride	ND		1.0	0.20	ug/L			09/21/20 11:37	1
2-Hexanone	ND		10	0.30	ug/L			09/21/20 11:37	1
Acetone	ND		20	0.70	ug/L			09/21/20 11:37	1
Chloroform	ND		1.0	0.20	ug/L			09/21/20 11:37	1
Benzene	ND		1.0	0.20	ug/L			09/21/20 11:37	1
1,1,1-Trichloroethane	ND		1.0	0.30	ug/L			09/21/20 11:37	1
Bromomethane	ND		1.0	0.30	ug/L			09/21/20 11:37	1
Chloromethane	ND		1.0	0.20	ug/L			09/21/20 11:37	1
Chloroethane	ND		1.0	0.20	ug/L			09/21/20 11:37	1
Vinyl chloride	ND		1.0	0.20	ug/L			09/21/20 11:37	1
Methylene Chloride	ND		1.0	0.30	ug/L			09/21/20 11:37	1
Carbon disulfide	ND		5.0	0.20	ug/L			09/21/20 11:37	1
Bromoform	ND		4.0	1.0	ug/L			09/21/20 11:37	1
Bromodichloromethane	ND		1.0	0.20	ug/L			09/21/20 11:37	1
1,1-Dichloroethane	ND		1.0	0.20	ug/L			09/21/20 11:37	1
1,1-Dichloroethene	ND		1.0	0.20	ug/L			09/21/20 11:37	1
Trichlorofluoromethane	ND		1.0	0.20	ug/L			09/21/20 11:37	1
Dichlorodifluoromethane	ND		1.0	0.20	ug/L			09/21/20 11:37	1
Freon 113	ND		10	0.20	ug/L			09/21/20 11:37	1
1,2-Dichloropropane	ND		1.0	0.20	ug/L			09/21/20 11:37	1
2-Butanone	ND		10	0.30	ug/L			09/21/20 11:37	1
1,1,2-Trichloroethane	ND		1.0	0.20	ug/L			09/21/20 11:37	1
Trichloroethene	ND		1.0	0.20	ug/L			09/21/20 11:37	1
Methyl acetate	ND		5.0	0.30	ug/L			09/21/20 11:37	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.20	ug/L			09/21/20 11:37	1
1,2-Dichlorobenzene	ND		5.0	0.20	ug/L			09/21/20 11:37	1
1,2-Dibromo-3-Chloropropane	ND		5.0	0.30	ug/L			09/21/20 11:37	1
Isopropylbenzene	ND		5.0	0.20	ug/L			09/21/20 11:37	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*		*09/21/20 11:37*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*09/21/20 11:37*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*09/21/20 11:37*	*1*
Toluene-d8 (Surr)	*99*		*80 - 120*		*09/21/20 11:37*	*1*

Lab Sample ID: LCS 410-45858/5
Matrix: Water
Analysis Batch: 45858

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,3-Dichloropropene	20.0	19.9		ug/L		99	75 - 120
trans-1,3-Dichloropropene	20.0	19.5		ug/L		97	67 - 120

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-45858/5
Matrix: Water
Analysis Batch: 45858

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethylbenzene	20.0	19.8		ug/L		99	80 - 120
Styrene	20.0	20.0		ug/L		100	80 - 120
1,4-Dichlorobenzene	20.0	20.2		ug/L		101	80 - 120
1,2-Dibromoethane	20.0	19.4		ug/L		97	77 - 120
1,2-Dichloroethane	20.0	20.1		ug/L		101	73 - 124
4-Methyl-2-pentanone	100	99.3		ug/L		99	62 - 133
Methylcyclohexane	20.0	18.5		ug/L		92	67 - 121
Toluene	20.0	19.6		ug/L		98	80 - 120
Chlorobenzene	20.0	20.1		ug/L		101	80 - 120
Cyclohexane	20.0	18.7		ug/L		94	68 - 126
1,2,4-Trichlorobenzene	20.0	19.3		ug/L		96	63 - 120
Dibromochloromethane	20.0	20.4		ug/L		102	71 - 120
Xylenes, Total	60.0	60.3		ug/L		101	80 - 120
Tetrachloroethene	20.0	19.7		ug/L		98	80 - 120
cis-1,2-Dichloroethene	20.0	21.5		ug/L		108	80 - 125
trans-1,2-Dichloroethene	20.0	20.8		ug/L		104	80 - 126
Methyl tertiary butyl ether	20.0	19.2		ug/L		96	69 - 122
1,3-Dichlorobenzene	20.0	20.1		ug/L		101	80 - 120
Carbon tetrachloride	20.0	20.6		ug/L		103	64 - 134
2-Hexanone	100	100		ug/L		100	56 - 135
Acetone	150	145		ug/L		97	54 - 157
Chloroform	20.0	20.2		ug/L		101	80 - 120
Benzene	20.0	20.0		ug/L		100	80 - 120
1,1,1-Trichloroethane	20.0	19.9		ug/L		99	67 - 126
Bromomethane	20.0	17.8		ug/L		89	53 - 128
Chloromethane	20.0	18.1		ug/L		90	56 - 121
Chloroethane	20.0	18.3		ug/L		91	55 - 123
Vinyl chloride	20.0	19.0		ug/L		95	56 - 120
Methylene Chloride	20.0	20.8		ug/L		104	80 - 120
Carbon disulfide	20.0	20.1		ug/L		100	65 - 128
Bromoform	20.0	19.7		ug/L		98	51 - 120
Bromodichloromethane	20.0	20.8		ug/L		104	71 - 120
1,1-Dichloroethane	20.0	20.3		ug/L		101	80 - 120
1,1-Dichloroethene	20.0	20.6		ug/L		103	80 - 131
Trichlorofluoromethane	20.0	18.1		ug/L		90	55 - 135
Dichlorodifluoromethane	20.0	15.9		ug/L		80	41 - 127
Freon 113	20.0	18.5		ug/L		93	73 - 139
1,2-Dichloropropane	20.0	20.0		ug/L		100	80 - 120
2-Butanone	150	148		ug/L		98	59 - 135
1,1,2-Trichloroethane	20.0	20.6		ug/L		103	80 - 120
Trichloroethene	20.0	20.3		ug/L		101	80 - 120
Methyl acetate	20.0	19.1		ug/L		96	54 - 136
1,1,2,2-Tetrachloroethane	20.0	20.0		ug/L		100	72 - 120
1,2-Dichlorobenzene	20.0	20.1		ug/L		101	80 - 120
1,2-Dibromo-3-Chloropropane	20.0	19.0		ug/L		95	47 - 131
Isopropylbenzene	20.0	19.9		ug/L		99	80 - 120

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-45858/5
Matrix: Water
Analysis Batch: 45858

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*80 - 120*
Dibromofluoromethane (Surr)	*100*		*80 - 120*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*
Toluene-d8 (Surr)	*99*		*80 - 120*

Lab Sample ID: LCSD 410-45858/7
Matrix: Water
Analysis Batch: 45858

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,3-Dichloropropene			20.0	19.6		ug/L		98	75 - 120	2	30
trans-1,3-Dichloropropene			20.0	18.9		ug/L		95	67 - 120	3	30
Ethylbenzene			20.0	19.7		ug/L		98	80 - 120	1	30
Styrene			20.0	19.6		ug/L		98	80 - 120	2	30
1,4-Dichlorobenzene			20.0	19.5		ug/L		97	80 - 120	3	30
1,2-Dibromoethane			20.0	19.4		ug/L		97	77 - 120	0	30
1,2-Dichloroethane			20.0	19.5		ug/L		98	73 - 124	3	30
4-Methyl-2-pentanone			100	98.3		ug/L		98	62 - 133	1	30
Methylcyclohexane			20.0	17.8		ug/L		89	67 - 121	4	30
Toluene			20.0	19.3		ug/L		96	80 - 120	2	30
Chlorobenzene			20.0	19.6		ug/L		98	80 - 120	2	30
Cyclohexane			20.0	18.3		ug/L		92	68 - 126	2	30
1,2,4-Trichlorobenzene			20.0	18.8		ug/L		94	63 - 120	3	30
Dibromochloromethane			20.0	20.0		ug/L		100	71 - 120	2	30
Xylenes, Total			60.0	59.2		ug/L		99	80 - 120	2	30
Tetrachloroethene			20.0	19.8		ug/L		99	80 - 120	1	30
cis-1,2-Dichloroethene			20.0	21.6		ug/L		108	80 - 125	1	30
trans-1,2-Dichloroethene			20.0	20.2		ug/L		101	80 - 126	3	30
Methyl tertiary butyl ether			20.0	19.2		ug/L		96	69 - 122	0	30
1,3-Dichlorobenzene			20.0	19.6		ug/L		98	80 - 120	3	30
Carbon tetrachloride			20.0	20.4		ug/L		102	64 - 134	1	30
2-Hexanone			100	98.8		ug/L		99	56 - 135	1	30
Acetone			150	138		ug/L		92	54 - 157	5	30
Chloroform			20.0	20.1		ug/L		101	80 - 120	0	30
Benzene			20.0	19.7		ug/L		98	80 - 120	2	30
1,1,1-Trichloroethane			20.0	19.6		ug/L		98	67 - 126	1	30
Bromomethane			20.0	18.2		ug/L		91	53 - 128	2	30
Chloromethane			20.0	18.0		ug/L		90	56 - 121	1	30
Chloroethane			20.0	18.5		ug/L		92	55 - 123	1	30
Vinyl chloride			20.0	18.4		ug/L		92	56 - 120	3	30
Methylene Chloride			20.0	21.0		ug/L		105	80 - 120	1	30
Carbon disulfide			20.0	20.0		ug/L		100	65 - 128	0	30
Bromoform			20.0	19.5		ug/L		97	51 - 120	1	30
Bromodichloromethane			20.0	20.4		ug/L		102	71 - 120	2	30
1,1-Dichloroethane			20.0	19.8		ug/L		99	80 - 120	3	30
1,1-Dichloroethene			20.0	20.2		ug/L		101	80 - 131	2	30
Trichlorofluoromethane			20.0	17.8		ug/L		89	55 - 135	2	30
Dichlorodifluoromethane			20.0	15.9		ug/L		80	41 - 127	0	30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 410-45858/7
Matrix: Water
Analysis Batch: 45858

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Freon 113			20.0	18.5		ug/L		92	73 - 139	0	30
1,2-Dichloropropane			20.0	19.8		ug/L		99	80 - 120	1	30
2-Butanone			150	145		ug/L		96	59 - 135	2	30
1,1,2-Trichloroethane			20.0	20.2		ug/L		101	80 - 120	2	30
Trichloroethene			20.0	19.8		ug/L		99	80 - 120	3	30
Methyl acetate			20.0	19.3		ug/L		97	54 - 136	1	30
1,1,2,2-Tetrachloroethane			20.0	19.6		ug/L		98	72 - 120	2	30
1,2-Dichlorobenzene			20.0	19.7		ug/L		99	80 - 120	2	30
1,2-Dibromo-3-Chloropropane			20.0	18.9		ug/L		95	47 - 131	0	30
Isopropylbenzene			20.0	19.5		ug/L		98	80 - 120	2	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 120*
Dibromofluoromethane (Surr)	*102*		*80 - 120*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*
Toluene-d8 (Surr)	*99*		*80 - 120*

QC Association Summary

Client: Stantec Consulting Corp.
Project/Site: PES UDEX GW Sampling

Job ID: 410-13599-1

GC/MS VOA

Analysis Batch: 43321

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-13599-2	TB_20200909	Total/NA	Water	8260C	
MB 410-43321/7	Method Blank	Total/NA	Water	8260C	
LCS 410-43321/4	Lab Control Sample	Total/NA	Water	8260C	
LCSD 410-43321/5	Lab Control Sample Dup	Total/NA	Water	8260C	

Analysis Batch: 45858

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-13599-1	S-383_20200909	Total/NA	Water	8260C	
410-13599-3	S-412_20200909	Total/NA	Water	8260C	
410-13599-4	S-433_20200909	Total/NA	Water	8260C	
410-13599-5	S-435_20200909	Total/NA	Water	8260C	
410-13599-6	S-434_20200909	Total/NA	Water	8260C	
410-13599-7	C-174_20200909	Total/NA	Water	8260C	
410-13599-8	S-436_20200910	Total/NA	Water	8260C	
410-13599-9	BF-106_20200910	Total/NA	Water	8260C	
410-13599-10	BF-99_20200910	Total/NA	Water	8260C	
MB 410-45858/9	Method Blank	Total/NA	Water	8260C	
LCS 410-45858/5	Lab Control Sample	Total/NA	Water	8260C	
LCSD 410-45858/7	Lab Control Sample Dup	Total/NA	Water	8260C	

Lab Chronicle

Client: Stantec Consulting Corp.
Project/Site: PES UDEX GW Sampling

Job ID: 410-13599-1

Client Sample ID: S-383_20200909
Lab Sample ID: 410-13599-1
Date Collected: 09/09/20 09:30
Matrix: Water
Date Received: 09/10/20 16:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	45858	09/21/20 14:43	NSK7	ELLE

Client Sample ID: TB_20200909
Lab Sample ID: 410-13599-2
Date Collected: 08/30/20 00:00
Matrix: Water
Date Received: 09/10/20 16:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	43321	09/13/20 20:34	TQ4J	ELLE

Client Sample ID: S-412_20200909
Lab Sample ID: 410-13599-3
Date Collected: 09/09/20 10:10
Matrix: Water
Date Received: 09/10/20 16:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	45858	09/21/20 18:51	NSK7	ELLE

Client Sample ID: S-433_20200909
Lab Sample ID: 410-13599-4
Date Collected: 09/09/20 11:00
Matrix: Water
Date Received: 09/10/20 16:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	45858	09/21/20 15:05	NSK7	ELLE

Client Sample ID: S-435_20200909
Lab Sample ID: 410-13599-5
Date Collected: 09/09/20 11:40
Matrix: Water
Date Received: 09/10/20 16:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	45858	09/21/20 15:28	NSK7	ELLE

Client Sample ID: S-434_20200909
Lab Sample ID: 410-13599-6
Date Collected: 09/09/20 12:55
Matrix: Water
Date Received: 09/10/20 16:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	45858	09/21/20 15:50	NSK7	ELLE

Client Sample ID: C-174_20200909
Lab Sample ID: 410-13599-7
Date Collected: 09/09/20 13:50
Matrix: Water
Date Received: 09/10/20 16:48

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	45858	09/21/20 16:13	NSK7	ELLE

Lab Chronicle

Client: Stantec Consulting Corp.
Project/Site: PES UDEX GW Sampling

Job ID: 410-13599-1

Client Sample ID: S-436_20200910
Date Collected: 09/10/20 08:55
Date Received: 09/10/20 16:48

Lab Sample ID: 410-13599-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	45858	09/21/20 16:36	NSK7	ELLE

Client Sample ID: BF-106_20200910
Date Collected: 09/10/20 10:20
Date Received: 09/10/20 16:48

Lab Sample ID: 410-13599-9
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		10	45858	09/21/20 18:29	NSK7	ELLE

Client Sample ID: BF-99_20200910
Date Collected: 09/10/20 11:00
Date Received: 09/10/20 16:48

Lab Sample ID: 410-13599-10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	45858	09/21/20 16:58	NSK7	ELLE

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Stantec Consulting Corp.
Job ID: 410-13599-1
Project/Site: PES UDEX GW Sampling

Laboratory: Eurofins Lancaster Laboratories Env, LLC

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Pennsylvania	NELAP	36-00037	01-31-21

Method Summary

Client: Stantec Consulting Corp.
Project/Site: PES UDEX GW Sampling

Job ID: 410-13599-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	ELLE
5030C	Purge and Trap	SW846	ELLE

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: Stantec Consulting Corp.
Project/Site: PES UDEX GW Sampling

Job ID: 410-13599-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
410-13599-1	S-383_20200909	Water	09/09/20 09:30	09/10/20 16:48	
410-13599-2	TB_20200909	Water	08/30/20 00:00	09/10/20 16:48	
410-13599-3	S-412_20200909	Water	09/09/20 10:10	09/10/20 16:48	
410-13599-4	S-433_20200909	Water	09/09/20 11:00	09/10/20 16:48	
410-13599-5	S-435_20200909	Water	09/09/20 11:40	09/10/20 16:48	
410-13599-6	S-434_20200909	Water	09/09/20 12:55	09/10/20 16:48	
410-13599-7	C-174_20200909	Water	09/09/20 13:50	09/10/20 16:48	
410-13599-8	S-436_20200910	Water	09/10/20 08:55	09/10/20 16:48	
410-13599-9	BF-106_20200910	Water	09/10/20 10:20	09/10/20 16:48	
410-13599-10	BF-99_20200910	Water	09/10/20 11:00	09/10/20 16:48	

Environmental Analysis Custody

eurofins | Lancaster Laboratories Environmental

Acct. # ___

410-13599 Chain of Custody

onmental use only

COC # 612315

Client Information

Client: Stantec Consulting	Acct. #: 42093
Project Name/#: PES UDEX GW Sampling	PWSID #:
Project Manager: Andrew Klingbeil	P.O. #: 213403039
Sampler: Dana Hopkins	Quote #:
State where samples were collected: PA	For Compliance: Yes ☐ No ☒

Matrix

Soil ☐ Sediment ☐ Tissue ☐ | Water ☒ Potable ☐ Ground ☐ NPDES ☐ Surface ☐ | Other: Trip blank

Analysis Requested

Preservation and Filtration Codes: H

For Lab Use Only
FSC:
SCR#:

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 P=H_3PO_4
F=Field Filtered O=Other

Remarks

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	VOC 8260C
S-383_20200909	9/9/20	0930	X		3	X
TB_20200909	8/30/20	—			2	X
S-412_20200909	9/9/20	1010	X		3	X
S-433_20200909	9/9/20	1105	X		3	X
S-435_20200909	9/9/20	1140	X		3	X
S-434_20200909	9/9/20	1255	X		3	X
C-174_20200909	9/9/20	1350	X		3	X
S-436_20200910	9/10/20	0855	X		3	X
BF-106_20200910	9/10/20	1020	X		3	X
DH BF-99_20200910	9/10/20	1100	X		3	X

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: ___

E-mail address: andrew.klingbeil@stantec.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) | Type VI (Raw Data Only)
Type III (Reduced non-CLP) | NJ DKQP | TX TRRP-13
NYSDEC Category A or B | MA MCP | CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	9/10/20	11:45	[signature]	9/10/20	11:45
[signature]	9/10/20	1535	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by [signature]	9-10-20	1618

EDD Required? Yes No
If yes, format: EDD EQuIS 4-file

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS ___ FedEx ___ Other ___

Temperature upon receipt 4.1 °C

Eurofins Lancaster Laboratories Environmental, LLC • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • FOR HELP COMPLETING FORM CHECK OUT https://www.eurofinsus.com/coc
The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 0919 KM

Login Sample Receipt Checklist

Client: Stantec Consulting Corp.

Job Number: 410-13599-1

Login Number: 13599
List Number: 1
Creator: Knoedler, Christine M

List Source: Eurofins Lancaster Laboratories Env

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	N/A	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified.	N/A	
Residual Chlorine Checked.	N/A	
Sample custody seals are intact.	N/A	

ANALYTICAL REPORT

Lab Number:	L2340867
Client:	Stantec, Inc. 1060 Andrew Drive Suite 140 West Chester, PA 19380
ATTN:	Andrew Klingbeil
Phone:	(610) 840-2525
Project Name:	PESRM UDEX RELEASE
Project Number:	213403039
Report Date:	08/08/23

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2340867
Report Date: 08/08/23

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2340867-01	TRIP BLANK		FORMER PHIL REFINERY	07/17/23 00:00	07/17/23
L2340867-02	S-280D_20230717	WATER	FORMER PHIL REFINERY	07/17/23 11:45	07/17/23
L2340867-03	S-507_20230717	WATER	FORMER PHIL REFINERY	07/17/23 12:15	07/17/23
L2340867-04	S-280_20230717	WATER	FORMER PHIL REFINERY	07/17/23 13:10	07/17/23
L2340867-05	C-174_20230717	WATER	FORMER PHIL REFINERY	07/17/23 14:15	07/17/23
L2340867-06	S-411_20230717	WATER	FORMER PHIL REFINERY	07/17/23 14:30	07/17/23

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2340867
Project Number:	213403039	**Report Date:**	08/08/23

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2340867
Project Number:	213403039	**Report Date:**	08/08/23

Case Narrative (continued)

Report Submission

August 08, 2023: This final report includes the results of all requested analyses.

August 04, 2023: This is a preliminary report.

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

The analysis of Sulfide was subcontracted. A copy of the laboratory report is included as an addendum. Please note: This data is only available in PDF format and is not available on Data Merger.

Sample Receipt

L2340867-01: A sample identified as "TRIP BLANK" was listed on the Chain of Custody, but not received. This was verified by the client.

Gasoline Range Organics

L2340867-05: The surrogate recovery was outside the acceptance criteria for 1,1,1-trifluorotoluene (134%); however, re-analysis achieved a similar result: 1,1,1-trifluorotoluene (139%). The results of the original analysis are reported.

Anions by Ion Chromatography

The WG1804604-3 MS recoveries, performed on L2340867-03, are outside the acceptance criteria for nitrogen, nitrate (69%) and sulfate (122%); however, the associated LCS recoveries are within criteria. No further action was taken.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Tiffani Morrissey - Tiffani Morrissey

Title: Technical Director/Representative Date: 08/08/23

ORGANICS

VOLATILES

Project Name: PESRM UDEX RELEASE **Lab Number:** L2340867

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-02 Date Collected: 07/17/23 11:45
Client ID: S-280D_20230717 Date Received: 07/17/23
Sample Location: FORMER PHIL REFINERY Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/26/23 08:30
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	5.0	0.24	1
Chloromethane	ND		ug/l	2.5	0.20	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Bromomethane	ND		ug/l	1.0	0.26	1
Chloroethane	ND		ug/l	1.0	0.13	1
Trichlorofluoromethane	ND		ug/l	2.5	0.16	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
Carbon disulfide	ND		ug/l	5.0	0.30	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15	1
Methylene chloride	ND		ug/l	2.5	0.68	1
Acetone	ND		ug/l	5.0	1.5	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16	1
Methyl Acetate	ND		ug/l	2.0	0.23	1
Methyl tert butyl ether	0.71	J	ug/l	1.0	0.17	1
1,1-Dichloroethane	1.4		ug/l	0.75	0.21	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16	1
Cyclohexane	ND		ug/l	10	0.27	1
Bromochloromethane	ND		ug/l	2.5	0.15	1
Chloroform	ND		ug/l	0.75	0.22	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16	1
2-Butanone	ND		ug/l	5.0	1.9	1
Benzene	ND		ug/l	0.50	0.16	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
Methyl cyclohexane	ND		ug/l	10	0.40	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1

Project Name: PESRM UDEX RELEASE **Lab Number:** L2340867

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-02 Date Collected: 07/17/23 11:45

Client ID: S-280D_20230717 Date Received: 07/17/23

Sample Location: FORMER PHIL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	0.50	0.19	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
Toluene	ND		ug/l	0.75	0.20	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,2-Dibromoethane	ND		ug/l	2.0	0.19	1
2-Hexanone	ND		ug/l	5.0	0.52	1
Chlorobenzene	ND		ug/l	0.50	0.18	1
Ethylbenzene	ND		ug/l	0.50	0.17	1
p/m-Xylene	ND		ug/l	1.0	0.33	1
o-Xylene	ND		ug/l	1.0	0.39	1
Xylenes, Total	ND		ug/l	1.0	0.33	1
Styrene	ND		ug/l	1.0	0.36	1
Bromoform	ND		ug/l	2.0	0.25	1
Isopropylbenzene	ND		ug/l	0.50	0.19	1
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	95		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	93		70-130
Dibromofluoromethane	100		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2340867

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-02
Client ID: S-280D_20230717
Sample Location: FORMER PHIL REFINERY

Date Collected: 07/17/23 11:45
Date Received: 07/17/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/26/23 08:30
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	1.2	J	ug/l	3.0	1.1	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	95		70-130
4-Bromofluorobenzene	91		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2340867

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-03 Date Collected: 07/17/23 12:15
Client ID: S-507_20230717 Date Received: 07/17/23
Sample Location: FORMER PHIL REFINERY Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/26/23 09:52
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	5.0	0.24	1
Chloromethane	ND		ug/l	2.5	0.20	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Bromomethane	ND		ug/l	1.0	0.26	1
Chloroethane	ND		ug/l	1.0	0.13	1
Trichlorofluoromethane	ND		ug/l	2.5	0.16	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
Carbon disulfide	ND		ug/l	5.0	0.30	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15	1
Methylene chloride	ND		ug/l	2.5	0.68	1
Acetone	ND		ug/l	5.0	1.5	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16	1
Methyl Acetate	ND		ug/l	2.0	0.23	1
Methyl tert butyl ether	2.5		ug/l	1.0	0.17	1
1,1-Dichloroethane	ND		ug/l	0.75	0.21	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16	1
Cyclohexane	1.9	J	ug/l	10	0.27	1
Bromochloromethane	ND		ug/l	2.5	0.15	1
Chloroform	ND		ug/l	0.75	0.22	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16	1
2-Butanone	ND		ug/l	5.0	1.9	1
Benzene	16		ug/l	0.50	0.16	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
Methyl cyclohexane	ND		ug/l	10	0.40	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1

Project Name: PESRM UDEX RELEASE **Lab Number:** L2340867

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-03 Date Collected: 07/17/23 12:15

Client ID: S-507_20230717 Date Received: 07/17/23

Sample Location: FORMER PHIL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	0.50	0.19	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
Toluene	1.9		ug/l	0.75	0.20	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,2-Dibromoethane	ND		ug/l	2.0	0.19	1
2-Hexanone	ND		ug/l	5.0	0.52	1
Chlorobenzene	ND		ug/l	0.50	0.18	1
Ethylbenzene	ND		ug/l	0.50	0.17	1
p/m-Xylene	ND		ug/l	1.0	0.33	1
o-Xylene	ND		ug/l	1.0	0.39	1
Xylenes, Total	ND		ug/l	1.0	0.33	1
Styrene	ND		ug/l	1.0	0.36	1
Bromoform	ND		ug/l	2.0	0.25	1
Isopropylbenzene	ND		ug/l	0.50	0.19	1
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	93		70-130
Toluene-d8	100		70-130
4-Bromofluorobenzene	93		70-130
Dibromofluoromethane	96		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2340867
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-03
Client ID: S-507_20230717
Sample Location: FORMER PHIL REFINERY
Date Collected: 07/17/23 12:15
Date Received: 07/17/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/26/23 09:52
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	1.1	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	91		70-130
4-Bromofluorobenzene	91		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2340867
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-03
Client ID: S-507_20230717
Sample Location: FORMER PHIL REFINERY
Date Collected: 07/17/23 12:15
Date Received: 07/17/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/20/23 10:04
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	124		mg/l	3.00	3.00	1

Project Name: PESRM UDEX RELEASE
Lab Number: L2340867
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-03
Client ID: S-507_20230717
Sample Location: FORMER PHIL REFINERY
Date Collected: 07/17/23 12:15
Date Received: 07/17/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/24/23 23:20
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	33.9		ug/l	2.00	2.00	1	A
Ethene	ND		ug/l	0.500	0.500	1	A
Ethane	ND		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE **Lab Number:** L2340867

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-04 Date Collected: 07/17/23 13:10
Client ID: S-280_20230717 Date Received: 07/17/23
Sample Location: FORMER PHIL REFINERY Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/26/23 08:58
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	5.0	0.24	1
Chloromethane	ND		ug/l	2.5	0.20	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Bromomethane	ND		ug/l	1.0	0.26	1
Chloroethane	ND		ug/l	1.0	0.13	1
Trichlorofluoromethane	ND		ug/l	2.5	0.16	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
Carbon disulfide	ND		ug/l	5.0	0.30	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15	1
Methylene chloride	ND		ug/l	2.5	0.68	1
Acetone	ND		ug/l	5.0	1.5	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16	1
Methyl Acetate	ND		ug/l	2.0	0.23	1
Methyl tert butyl ether	ND		ug/l	1.0	0.17	1
1,1-Dichloroethane	ND		ug/l	0.75	0.21	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16	1
Cyclohexane	0.37	J	ug/l	10	0.27	1
Bromochloromethane	ND		ug/l	2.5	0.15	1
Chloroform	ND		ug/l	0.75	0.22	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16	1
2-Butanone	ND		ug/l	5.0	1.9	1
Benzene	97		ug/l	0.50	0.16	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
Methyl cyclohexane	ND		ug/l	10	0.40	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1

Project Name: PESRM UDEX RELEASE **Lab Number:** L2340867

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-04 Date Collected: 07/17/23 13:10

Client ID: S-280_20230717 Date Received: 07/17/23

Sample Location: FORMER PHIL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	0.50	0.19	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
Toluene	2.6		ug/l	0.75	0.20	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,2-Dibromoethane	ND		ug/l	2.0	0.19	1
2-Hexanone	ND		ug/l	5.0	0.52	1
Chlorobenzene	ND		ug/l	0.50	0.18	1
Ethylbenzene	ND		ug/l	0.50	0.17	1
p/m-Xylene	ND		ug/l	1.0	0.33	1
o-Xylene	ND		ug/l	1.0	0.39	1
Xylenes, Total	ND		ug/l	1.0	0.33	1
Styrene	ND		ug/l	1.0	0.36	1
Bromoform	ND		ug/l	2.0	0.25	1
Isopropylbenzene	ND		ug/l	0.50	0.19	1
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	91		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	92		70-130
Dibromofluoromethane	98		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2340867

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-04
Client ID: S-280_20230717
Sample Location: FORMER PHIL REFINERY

Date Collected: 07/17/23 13:10
Date Received: 07/17/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/26/23 08:58
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	1.1	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	91		70-130
4-Bromofluorobenzene	90		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2340867

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-05 Date Collected: 07/17/23 14:15
Client ID: C-174_20230717 Date Received: 07/17/23
Sample Location: FORMER PHIL REFINERY Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/26/23 10:20
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	5.0	0.24	1
Chloromethane	ND		ug/l	2.5	0.20	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Bromomethane	ND		ug/l	1.0	0.26	1
Chloroethane	ND		ug/l	1.0	0.13	1
Trichlorofluoromethane	ND		ug/l	2.5	0.16	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
Carbon disulfide	ND		ug/l	5.0	0.30	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15	1
Methylene chloride	ND		ug/l	2.5	0.68	1
Acetone	ND		ug/l	5.0	1.5	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16	1
Methyl Acetate	ND		ug/l	2.0	0.23	1
Methyl tert butyl ether	ND		ug/l	1.0	0.17	1
1,1-Dichloroethane	ND		ug/l	0.75	0.21	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16	1
Cyclohexane	ND		ug/l	10	0.27	1
Bromochloromethane	ND		ug/l	2.5	0.15	1
Chloroform	ND		ug/l	0.75	0.22	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16	1
2-Butanone	ND		ug/l	5.0	1.9	1
Benzene	ND		ug/l	0.50	0.16	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
Methyl cyclohexane	ND		ug/l	10	0.40	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1

Project Name: PESRM UDEX RELEASE **Lab Number:** L2340867

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-05 Date Collected: 07/17/23 14:15

Client ID: C-174_20230717 Date Received: 07/17/23

Sample Location: FORMER PHIL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	0.50	0.19	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
Toluene	ND		ug/l	0.75	0.20	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,2-Dibromoethane	ND		ug/l	2.0	0.19	1
2-Hexanone	ND		ug/l	5.0	0.52	1
Chlorobenzene	ND		ug/l	0.50	0.18	1
Ethylbenzene	ND		ug/l	0.50	0.17	1
p/m-Xylene	ND		ug/l	1.0	0.33	1
o-Xylene	ND		ug/l	1.0	0.39	1
Xylenes, Total	ND		ug/l	1.0	0.33	1
Styrene	ND		ug/l	1.0	0.36	1
Bromoform	ND		ug/l	2.0	0.25	1
Isopropylbenzene	ND		ug/l	0.50	0.19	1
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	90		70-130
Toluene-d8	101		70-130
4-Bromofluorobenzene	93		70-130
Dibromofluoromethane	92		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2340867

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-05 Date Collected: 07/17/23 14:15
Client ID: C-174_20230717 Date Received: 07/17/23
Sample Location: FORMER PHIL REFINERY Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/26/23 10:20
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	1.1	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	90		70-130
4-Bromofluorobenzene	93		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2340867

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-06 Date Collected: 07/17/23 14:30
Client ID: S-411_20230717 Date Received: 07/17/23
Sample Location: FORMER PHIL REFINERY Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/26/23 09:25
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	5.0	0.24	1
Chloromethane	ND		ug/l	2.5	0.20	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Bromomethane	ND		ug/l	1.0	0.26	1
Chloroethane	ND		ug/l	1.0	0.13	1
Trichlorofluoromethane	ND		ug/l	2.5	0.16	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
Carbon disulfide	ND		ug/l	5.0	0.30	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15	1
Methylene chloride	ND		ug/l	2.5	0.68	1
Acetone	ND		ug/l	5.0	1.5	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16	1
Methyl Acetate	ND		ug/l	2.0	0.23	1
Methyl tert butyl ether	ND		ug/l	1.0	0.17	1
1,1-Dichloroethane	ND		ug/l	0.75	0.21	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16	1
Cyclohexane	ND		ug/l	10	0.27	1
Bromochloromethane	ND		ug/l	2.5	0.15	1
Chloroform	ND		ug/l	0.75	0.22	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16	1
2-Butanone	ND		ug/l	5.0	1.9	1
Benzene	ND		ug/l	0.50	0.16	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
Methyl cyclohexane	ND		ug/l	10	0.40	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1

Project Name: PESRM UDEX RELEASE **Lab Number:** L2340867

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-06 Date Collected: 07/17/23 14:30

Client ID: S-411_20230717 Date Received: 07/17/23

Sample Location: FORMER PHIL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	0.50	0.19	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
Toluene	ND		ug/l	0.75	0.20	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,2-Dibromoethane	ND		ug/l	2.0	0.19	1
2-Hexanone	ND		ug/l	5.0	0.52	1
Chlorobenzene	ND		ug/l	0.50	0.18	1
Ethylbenzene	ND		ug/l	0.50	0.17	1
p/m-Xylene	ND		ug/l	1.0	0.33	1
o-Xylene	ND		ug/l	1.0	0.39	1
Xylenes, Total	ND		ug/l	1.0	0.33	1
Styrene	ND		ug/l	1.0	0.36	1
Bromoform	ND		ug/l	2.0	0.25	1
Isopropylbenzene	ND		ug/l	0.50	0.19	1
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	98		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	95		70-130
Dibromofluoromethane	97		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2340867

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-06
Client ID: S-411_20230717
Sample Location: FORMER PHIL REFINERY

Date Collected: 07/17/23 14:30
Date Received: 07/17/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/26/23 09:25
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	1.1	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	95		70-130
4-Bromofluorobenzene	92		70-130

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2340867
Report Date: 08/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 117,-
Analytical Date: 07/20/23 09:43
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL
Dissolved Gases by GC - Mansfield Lab for sample(s): 03 Batch: WG1805450-3					
Carbon Dioxide	ND		mg/l	3.00	3.00

Project Name: PESRM UDEX RELEASE **Lab Number:** L2340867

Project Number: 213403039 **Report Date:** 08/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 117,-
Analytical Date: 07/24/23 16:12
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	
Dissolved Gases by GC - Mansfield Lab for sample(s): 03 Batch: WG1805992-3						
Methane	ND		ug/l	2.00	2.00	A
Ethene	ND		ug/l	0.500	0.500	A
Ethane	ND		ug/l	0.500	0.500	A

Project Name: PESRM UDEX RELEASE **Lab Number:** L2340867

Project Number: 213403039 **Report Date:** 08/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/26/23 05:45
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02-06 Batch: WG1808273-5					
Dichlorodifluoromethane	ND		ug/l	5.0	0.24
Chloromethane	ND		ug/l	2.5	0.20
Vinyl chloride	ND		ug/l	1.0	0.07
Bromomethane	ND		ug/l	1.0	0.26
Chloroethane	ND		ug/l	1.0	0.13
Trichlorofluoromethane	ND		ug/l	2.5	0.16
1,1-Dichloroethene	ND		ug/l	0.50	0.17
Carbon disulfide	ND		ug/l	5.0	0.30
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15
Methylene chloride	ND		ug/l	2.5	0.68
Acetone	ND		ug/l	5.0	1.5
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16
Methyl Acetate	ND		ug/l	2.0	0.23
Methyl tert butyl ether	ND		ug/l	1.0	0.17
1,1-Dichloroethane	ND		ug/l	0.75	0.21
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16
Cyclohexane	ND		ug/l	10	0.27
Bromochloromethane	ND		ug/l	2.5	0.15
Chloroform	ND		ug/l	0.75	0.22
Carbon tetrachloride	ND		ug/l	0.50	0.13
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16
2-Butanone	ND		ug/l	5.0	1.9
Benzene	ND		ug/l	0.50	0.16
1,2-Dichloroethane	ND		ug/l	0.50	0.13
Methyl cyclohexane	ND		ug/l	10	0.40
Trichloroethene	ND		ug/l	0.50	0.18
1,2-Dichloropropane	ND		ug/l	1.0	0.14
Bromodichloromethane	ND		ug/l	0.50	0.19

Project Name: PESRM UDEX RELEASE **Lab Number:** L2340867

Project Number: 213403039 **Report Date:** 08/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/26/23 05:45
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02-06 Batch: WG1808273-5					
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14
Toluene	ND		ug/l	0.75	0.20
Tetrachloroethene	ND		ug/l	0.50	0.18
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14
Dibromochloromethane	ND		ug/l	0.50	0.15
1,2-Dibromoethane	ND		ug/l	2.0	0.19
2-Hexanone	ND		ug/l	5.0	0.52
Chlorobenzene	ND		ug/l	0.50	0.18
Ethylbenzene	ND		ug/l	0.50	0.17
p/m-Xylene	ND		ug/l	1.0	0.33
o-Xylene	ND		ug/l	1.0	0.39
Xylenes, Total	ND		ug/l	1.0	0.33
Styrene	ND		ug/l	1.0	0.36
Bromoform	ND		ug/l	2.0	0.25
Isopropylbenzene	ND		ug/l	0.50	0.19
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23

Project Name: PESRM UDEX RELEASE **Lab Number:** L2340867

Project Number: 213403039 **Report Date:** 08/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/26/23 05:45
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02-06 Batch: WG1808273-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	93		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	93		70-130
Dibromofluoromethane	98		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2340867

Project Number: 213403039 **Report Date:** 08/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/26/23 05:45
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 02-06 Batch: WG1808274-5					
1,4-Dioxane	ND		ug/l	3.0	1.1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	93		70-130
4-Bromofluorobenzene	91		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2340867

Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Dissolved Gases by GC - Mansfield Lab	Associated sample(s): 03		Batch: WG1805450-2					
Carbon Dioxide	93		-		80-120	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2340867

Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Dissolved Gases by GC - Mansfield Lab Associated sample(s): 03 Batch: WG1805992-2									
Methane	104		-		80-120	-		25	A
Ethene	99		-		80-120	-		25	A
Ethane	99		-		80-120	-		25	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2340867

Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02-06 Batch: WG1808273-3 WG1808273-4								
Dichlorodifluoromethane	130		130		36-147	0		20
Chloromethane	110		110		64-130	0		20
Vinyl chloride	120		120		55-140	0		20
Bromomethane	91		100		39-139	9		20
Chloroethane	96		100		55-138	4		20
Trichlorofluoromethane	100		100		62-150	0		20
1,1-Dichloroethene	110		110		61-145	0		20
Carbon disulfide	100		100		51-130	0		20
1,1,2-Trichloro-1,2,2-Trifluoroethane	120		120		70-130	0		20
Methylene chloride	100		100		70-130	0		20
Acetone	120		110		58-148	9		20
trans-1,2-Dichloroethene	110		110		70-130	0		20
Methyl Acetate	110		120		70-130	9		20
Methyl tert butyl ether	110		100		63-130	10		20
1,1-Dichloroethane	110		110		70-130	0		20
cis-1,2-Dichloroethene	100		100		70-130	0		20
Cyclohexane	110		110		70-130	0		20
Bromochloromethane	110		100		70-130	10		20
Chloroform	100		110		70-130	10		20
Carbon tetrachloride	110		110		63-132	0		20
1,1,1-Trichloroethane	110		110		67-130	0		20
2-Butanone	100		100		63-138	0		20
Benzene	100		100		70-130	0		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2340867
Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02-06 Batch: WG1808273-3 WG1808273-4								
1,2-Dichloroethane	110		110		70-130	0		20
Methyl cyclohexane	110		110		70-130	0		20
Trichloroethene	110		110		70-130	0		20
1,2-Dichloropropane	100		100		70-130	0		20
Bromodichloromethane	100		100		67-130	0		20
cis-1,3-Dichloropropene	96		98		70-130	2		20
Toluene	110		110		70-130	0		20
Tetrachloroethene	120		120		70-130	0		20
4-Methyl-2-pentanone	92		88		59-130	4		20
trans-1,3-Dichloropropene	100		100		70-130	0		20
1,1,2-Trichloroethane	110		110		70-130	0		20
Dibromochloromethane	100		100		63-130	0		20
1,2-Dibromoethane	100		110		70-130	10		20
2-Hexanone	92		95		57-130	3		20
Chlorobenzene	110		100		75-130	10		20
Ethylbenzene	110		110		70-130	0		20
p/m-Xylene	105		105		70-130	0		20
o-Xylene	105		105		70-130	0		20
Styrene	105		105		70-130	0		20
Bromoform	100		95		54-136	5		20
Isopropylbenzene	110		110		70-130	0		20
1,3-Dichlorobenzene	110		110		70-130	0		20
1,4-Dichlorobenzene	110		110		70-130	0		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2340867

Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02-06 Batch: WG1808273-3 WG1808273-4								
1,2-Dichlorobenzene	110		110		70-130	0		20
1,2-Dibromo-3-chloropropane	99		100		41-144	1		20
1,2,4-Trichlorobenzene	120		110		70-130	9		20
1,2,3-Trichlorobenzene	120		120		70-130	0		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	88		94		70-130
Toluene-d8	97		97		70-130
4-Bromofluorobenzene	95		96		70-130
Dibromofluoromethane	92		91		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2340867

Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 02-06 Batch: WG1808274-3 WG1808274-4								
1,4-Dioxane	97		120		70-130	21		25
1,1,2,2-Tetrachloroethane	112		105		70-130	6		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	94		94		70-130
4-Bromofluorobenzene	91		91		70-130

Lab Duplicate Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2340867
Report Date: 08/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Dissolved Gases by GC - Mansfield Lab Associated sample(s): 03 QC Batch ID: WG1805450-4 QC Sample: L2340867-03 Client ID: S-507_20230717						
Carbon Dioxide	124	118	mg/l	5		25

PETROLEUM HYDROCARBONS

Project Name: PESRM UDEX RELEASE
Lab Number: L2340867
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-02
Client ID: S-280D_20230717
Sample Location: FORMER PHIL REFINERY

Date Collected: 07/17/23 11:45
Date Received: 07/17/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/19/23 12:27
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	23	J	ug/l	50	3.0	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	104		70-130
4-Bromofluorobenzene	102		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2340867
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-02
Client ID: S-280D_20230717
Sample Location: FORMER PHIL REFINERY

Date Collected: 07/17/23 11:45
Date Received: 07/17/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/22/23 14:08
Analyst: ALL

Extraction Method: EPA 3510C
Extraction Date: 07/21/23 12:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	215	J	ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	67		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2340867
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-03
Client ID: S-507_20230717
Sample Location: FORMER PHIL REFINERY

Date Collected: 07/17/23 12:15
Date Received: 07/17/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/19/23 13:59
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	84		ug/l	50	3.0	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	112		70-130
4-Bromofluorobenzene	117		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2340867
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-03
Client ID: S-507_20230717
Sample Location: FORMER PHIL REFINERY

Date Collected: 07/17/23 12:15
Date Received: 07/17/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/22/23 14:43
Analyst: ALL

Extraction Method: EPA 3510C
Extraction Date: 07/21/23 12:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	376	J	ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	74		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2340867
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-04
Client ID: S-280_20230717
Sample Location: FORMER PHIL REFINERY

Date Collected: 07/17/23 13:10
Date Received: 07/17/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/19/23 14:30
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	120		ug/l	50	3.0	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	112		70-130
4-Bromofluorobenzene	116		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2340867
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-04
Client ID: S-280_20230717
Sample Location: FORMER PHIL REFINERY

Date Collected: 07/17/23 13:10
Date Received: 07/17/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/22/23 15:18
Analyst: ALL

Extraction Method: EPA 3510C
Extraction Date: 07/21/23 12:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	525		ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	73		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2340867
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-05
Client ID: C-174_20230717
Sample Location: FORMER PHIL REFINERY

Date Collected: 07/17/23 14:15
Date Received: 07/17/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/19/23 15:01
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	260		ug/l	50	3.0	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	**134**	Q	70-130
4-Bromofluorobenzene	117		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2340867
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-05
Client ID: C-174_20230717
Sample Location: FORMER PHIL REFINERY

Date Collected: 07/17/23 14:15
Date Received: 07/17/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/22/23 15:52
Analyst: ALL

Extraction Method: EPA 3510C
Extraction Date: 07/21/23 12:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	332	J	ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	77		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2340867
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-06
Client ID: S-411_20230717
Sample Location: FORMER PHIL REFINERY

Date Collected: 07/17/23 14:30
Date Received: 07/17/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/19/23 15:32
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	17	J	ug/l	50	3.0	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	112		70-130
4-Bromofluorobenzene	118		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2340867
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-06
Client ID: S-411_20230717
Sample Location: FORMER PHIL REFINERY

Date Collected: 07/17/23 14:30
Date Received: 07/17/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/22/23 16:27
Analyst: ALL

Extraction Method: EPA 3510C
Extraction Date: 07/21/23 12:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	201	J	ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	78		40-140

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2340867
Report Date: 08/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 07/19/23 11:48
Analyst: BAD

Parameter	Result	Qualifier	Units	RL	MDL
Gasoline Range Organics - Westborough Lab for sample(s): 02-06 Batch: WG1805518-4					
Gasoline Range Organics	19	J	ug/l	50	3.0

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	106		70-130
4-Bromofluorobenzene	102		70-130

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2340867
Report Date: 08/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 07/22/23 12:23
Analyst: ALL

Extraction Method: EPA 3510C
Extraction Date: 07/21/23 12:28

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 02-06 Batch: WG1806147-1					
TPH (C9-C44)	140	J	ug/l	500	86.2

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	73		40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2340867

Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Gasoline Range Organics - Westborough Lab	Associated sample(s): 02-06		Batch: WG1805518-2		WG1805518-3			
Gasoline Range Organics	89		98		80-120	10		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,1,1-Trifluorotoluene	110		111		70-130
4-Bromofluorobenzene	104		108		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2340867

Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 02-06 Batch: WG1806147-2								
TPH (C9-C44)	81		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	81				40-140

Matrix Spike Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2340867

Report Date: 08/08/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Gasoline Range Organics - Westborough Lab Associated sample(s): 02-06 QC Batch ID: WG1805518-6 QC Sample: L2340867-02 Client ID: S-280D_20230717												
Gasoline Range Organics	23J	400	410	103		-	-		80-120	-		20

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	107				70-130
4-Bromofluorobenzene	111				70-130

Lab Duplicate Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2340867
Report Date: 08/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Gasoline Range Organics - Westborough Lab Associated sample(s): 02-06 QC Batch ID: WG1805518-5 QC Sample: L2340867-02 Client ID: S-280D_20230717						
Gasoline Range Organics	23J	21J	ug/l	NC		20

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	104		113		70-130
4-Bromofluorobenzene	102		115		70-130

METALS

Project Name: PESRM UDEX RELEASE
Lab Number: L2340867
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-03
Client ID: S-507_20230717
Sample Location: FORMER PHIL REFINERY
Date Collected: 07/17/23 12:15
Date Received: 07/17/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	62700		ug/l	100.	35.0	1	07/19/23 21:31	08/08/23 08:52	EPA 3005A	1,6010D	DMB
Iron, Total	750.		ug/l	50.0	9.00	1	07/19/23 21:31	08/08/23 08:52	EPA 3005A	1,6010D	DMB
Magnesium, Total	46200		ug/l	100.	15.3	1	07/19/23 21:31	08/08/23 08:52	EPA 3005A	1,6010D	DMB
Potassium, Total	10200		ug/l	2500	237.	1	07/19/23 21:31	08/08/23 08:52	EPA 3005A	1,6010D	DMB
Sodium, Total	85900		ug/l	2000	120.	1	07/19/23 21:31	08/08/23 08:52	EPA 3005A	1,6010D	DMB

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2340867
Report Date: 08/08/23

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 03 Batch: WG1805052-1										
Calcium, Total	ND		ug/l	100	35.0	1	07/19/23 21:31	07/25/23 13:29	1,6010D	AMW
Iron, Total	ND		ug/l	50.0	9.00	1	07/19/23 21:31	07/25/23 13:29	1,6010D	AMW
Magnesium, Total	ND		ug/l	100	15.3	1	07/19/23 21:31	07/25/23 13:29	1,6010D	AMW
Potassium, Total	ND		ug/l	2500	237.	1	07/19/23 21:31	07/25/23 13:29	1,6010D	AMW
Sodium, Total	206.	J	ug/l	2000	120.	1	07/19/23 21:31	07/25/23 13:29	1,6010D	AMW

Prep Information

Digestion Method: EPA 3005A

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2340867

Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 03 Batch: WG1805052-2								
Calcium, Total	96		-		80-120	-		
Iron, Total	96		-		80-120	-		
Magnesium, Total	101		-		80-120	-		
Potassium, Total	100		-		80-120	-		
Sodium, Total	98		-		80-120	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2340867
Report Date: 08/08/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 03 QC Batch ID: WG1805052-3 QC Sample: L2340816-15 Client ID: MS Sample												
Calcium, Total	65900	10000	73900	80		-	-		75-125	-		20
Iron, Total	1520	1000	2440	92		-	-		75-125	-		20
Magnesium, Total	20600	10000	30000	94		-	-		75-125	-		20
Potassium, Total	1960J	10000	12500	125		-	-		75-125	-		20
Sodium, Total	287000	10000	292000	**50**	Q	-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2340867

Report Date: 08/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 03 QC Batch ID: WG1805052-4 QC Sample: L2340816-15 Client ID: DUP Sample						
Iron, Total	1520	1550	ug/l	2		20

INORGANICS
&
MISCELLANEOUS

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2340867
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2340867-03
Client ID: S-507_20230717
Sample Location: FORMER PHIL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/17/23 12:15
Date Received: 07/17/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	07/31/23 12:00	121,2320B	NGS
Alkalinity, Bicarbonate	306000		ug CaCO3/L	2000	NA	1	-	07/31/23 12:00	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	123000		ug/l	5000	839.	10	-	07/18/23 11:50	44,300.0	CVN
Nitrogen, Nitrate	ND		ug/l	50.0	12.8	1	-	07/18/23 12:27	44,300.0	CVN
Sulfate	77000		ug/l	1000	454.	1	-	07/18/23 12:27	44,300.0	CVN

Project Name: PESRM UDEX RELEASE
Lab Number: L2340867
Project Number: 213403039
Report Date: 08/08/23

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Anions by Ion Chromatography - Westborough Lab for sample(s): 03 Batch: WG1804604-1										
Chloride	ND		ug/l	500	83.9	1	-	07/18/23 10:26	44,300.0	CVN
Nitrogen, Nitrate	ND		ug/l	50.0	12.8	1	-	07/18/23 10:26	44,300.0	CVN
Sulfate	ND		ug/l	1000	454.	1	-	07/18/23 10:26	44,300.0	CVN
General Chemistry - Westborough Lab for sample(s): 03 Batch: WG1810019-1										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	07/31/23 12:00	121,2320B	NGS
General Chemistry - Westborough Lab for sample(s): 03 Batch: WG1810020-1										
Alkalinity, Bicarbonate	ND		ug CaCO3/L	2000	NA	1	-	07/31/23 12:00	121,2320B	NGS

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2340867

Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 03 Batch: WG1804604-2								
Chloride	103		-		90-110	-		
Nitrogen, Nitrate	103		-		90-110	-		
Sulfate	103		-		90-110	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2340867
Report Date: 08/08/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 03 QC Batch ID: WG1804604-3 QC Sample: L2340867-03 Client ID: S-507_20230717												
Chloride	123000	4000	164000	103		-	-		90-110	-		18
Nitrogen, Nitrate	ND	400	276	**69**	Q	-	-		90-110	-		15
Sulfate	77000	8000	82600	**122**	Q	-	-		90-110	-		20

Lab Duplicate Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2340867
Report Date: 08/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 03 QC Batch ID: WG1804604-4 QC Sample: L2340867-03 Client ID: S-507_20230717						
Chloride	123000	124000	ug/l	1		18
Nitrogen, Nitrate	ND	ND	ug/l	NC		15
Sulfate	77000	83400	ug/l	4		20
General Chemistry - Westborough Lab Associated sample(s): 03 QC Batch ID: WG1810019-2 QC Sample: L2340867-03 Client ID: S-507_20230717						
Alkalinity, Carbonate	ND	ND	ug CaCO3/L	NC		10
General Chemistry - Westborough Lab Associated sample(s): 03 QC Batch ID: WG1810020-2 QC Sample: L2340867-03 Client ID: S-507_20230717						
Alkalinity, Bicarbonate	306000	303000	ug CaCO3/L	1		9

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2340867
Report Date: 08/08/23

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent
B	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2340867-02A	Vial HCl preserved	B	NA		3.7	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2340867-02B	Vial HCl preserved	B	NA		3.7	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2340867-02C	Vial HCl preserved	B	NA		3.7	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2340867-02D	Vial HCl preserved	B	NA		3.7	Y	Absent		PA-TPH-GRO(14)
L2340867-02E	Vial HCl preserved	B	NA		3.7	Y	Absent		PA-TPH-GRO(14)
L2340867-02F	Vial HCl preserved	B	NA		3.7	Y	Absent		PA-TPH-GRO(14)
L2340867-02G	Amber 500ml unpreserved	B	7	7	3.7	Y	Absent		PA-TPH-DROD-C44(7)
L2340867-02H	Amber 500ml unpreserved	B	7	7	3.7	Y	Absent		PA-TPH-DROD-C44(7)
L2340867-03A	Vial HCl preserved	A	NA		6.0	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2340867-03B	Vial HCl preserved	A	NA		6.0	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2340867-03C	Vial HCl preserved	A	NA		6.0	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2340867-03D	Vial HCl preserved	A	NA		6.0	Y	Absent		PA-TPH-GRO(14)
L2340867-03E	Vial HCl preserved	A	NA		6.0	Y	Absent		PA-TPH-GRO(14)
L2340867-03F	Vial HCl preserved	A	NA		6.0	Y	Absent		PA-TPH-GRO(14)
L2340867-03G	20ml Vial HCl preserved	A	NA		6.0	Y	Absent		DISSGAS(14)
L2340867-03H	20ml Vial HCl preserved	A	NA		6.0	Y	Absent		DISSGAS(14)
L2340867-03I	Vial unpreserved 20ml	A	NA		6.0	Y	Absent		DISSGAS-CO2(7)
L2340867-03J	Vial unpreserved 20ml	A	NA		6.0	Y	Absent		DISSGAS-CO2(7)
L2340867-03K	Plastic 250ml unpreserved	A	7	7	6.0	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2340867-03L	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	6.0	Y	Absent		SUB-SULFIDE()
L2340867-03M	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	6.0	Y	Absent		SUB-SULFIDE()

*Values in parentheses indicate holding time in days

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2340867-03N	Plastic 250ml HNO3 preserved	A	<2	<2	6.0	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),NA-TI-PPB(180),K-TI-PPB(180),FE-TI-PPB(180)
L2340867-03O	Plastic 500ml unpreserved/No Headspace	A	NA		6.0	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2340867-03P	Amber 500ml unpreserved	A	7	7	6.0	Y	Absent		PA-TPH-DROD-C44(7)
L2340867-03Q	Amber 500ml unpreserved	A	7	7	6.0	Y	Absent		PA-TPH-DROD-C44(7)
L2340867-03R	Amber 500ml unpreserved	A	7	7	6.0	Y	Absent		PA-TPH-DROD-C44(7)
L2340867-03S	Amber 500ml unpreserved	A	7	7	6.0	Y	Absent		PA-TPH-DROD-C44(7)
L2340867-03T	Amber 500ml unpreserved	A	7	7	6.0	Y	Absent		PA-TPH-DROD-C44(7)
L2340867-03U	Amber 500ml unpreserved	A	7	7	6.0	Y	Absent		PA-TPH-DROD-C44(7)
L2340867-04A	Vial HCl preserved	B	NA		3.7	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2340867-04B	Vial HCl preserved	B	NA		3.7	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2340867-04C	Vial HCl preserved	B	NA		3.7	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2340867-04D	Vial HCl preserved	B	NA		3.7	Y	Absent		PA-TPH-GRO(14)
L2340867-04E	Vial HCl preserved	B	NA		3.7	Y	Absent		PA-TPH-GRO(14)
L2340867-04F	Vial HCl preserved	B	NA		3.7	Y	Absent		PA-TPH-GRO(14)
L2340867-04G	Amber 500ml unpreserved	B	7	7	3.7	Y	Absent		PA-TPH-DROD-C44(7)
L2340867-04H	Amber 500ml unpreserved	B	7	7	3.7	Y	Absent		PA-TPH-DROD-C44(7)
L2340867-05A	Vial HCl preserved	B	NA		3.7	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2340867-05B	Vial HCl preserved	B	NA		3.7	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2340867-05C	Vial HCl preserved	B	NA		3.7	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2340867-05D	Vial HCl preserved	B	NA		3.7	Y	Absent		PA-TPH-GRO(14)
L2340867-05E	Vial HCl preserved	B	NA		3.7	Y	Absent		PA-TPH-GRO(14)
L2340867-05F	Vial HCl preserved	B	NA		3.7	Y	Absent		PA-TPH-GRO(14)
L2340867-05G	Amber 500ml unpreserved	B	7	7	3.7	Y	Absent		PA-TPH-DROD-C44(7)
L2340867-05H	Amber 500ml unpreserved	B	7	7	3.7	Y	Absent		PA-TPH-DROD-C44(7)
L2340867-06A	Vial HCl preserved	A	NA		6.0	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2340867-06B	Vial HCl preserved	A	NA		6.0	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2340867-06C	Vial HCl preserved	A	NA		6.0	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2340867-06D	Vial HCl preserved	A	NA		6.0	Y	Absent		PA-TPH-GRO(14)

*Values in parentheses indicate holding time in days

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2340867
Report Date: 08/08/23

Container Information

Container ID	*Container Type*	*Cooler*	*Initial pH*	*Final pH*	*Temp deg C*	*Pres*	*Seal*	*Frozen Date/Time*	*Analysis(*)*
L2340867-06E	Vial HCl preserved	A	NA		6.0	Y	Absent		PA-TPH-GRO(14)
L2340867-06F	Vial HCl preserved	A	NA		6.0	Y	Absent		PA-TPH-GRO(14)
L2340867-06G	Amber 500ml unpreserved	A	7	7	6.0	Y	Absent		PA-TPH-DROD-C44(7)
L2340867-06H	Amber 500ml unpreserved	A	7	7	6.0	Y	Absent		PA-TPH-DROD-C44(7)

*Values in parentheses indicate holding time in days

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2340867
Project Number:	213403039	**Report Date:**	08/08/23

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: DU Report with 'J' Qualifiers

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2340867
Project Number:	213403039	**Report Date:**	08/08/23

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively

Report Format: DU Report with 'J' Qualifiers

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2340867
Project Number:	213403039	**Report Date:**	08/08/23

Data Qualifiers

Identified Compounds (TICs). For calculated parameters, this represents that one or more values used in the calculation were estimated.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

ND - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2340867
Project Number:	213403039	**Report Date:**	08/08/23

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.

44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.

117 Technical Guidance for the Natural Attenuation Indicators: Methane, Ethane, and Ethene, EPA-NE, Revision 1, February 21, 2002 and Sample Preparation & Calculations for Dissolved Gas Analysis in Water Samples using a GC Headspace Equilibration Technique, EPA RSKSOP-175, Revision 2, May 2004.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; EPA 353.2: Nitrate-N, Nitrite-N; SM4500NO3-F: Nitrate-N, Nitrite-N; SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B
EPA 524.2: THMs and VOCs; EPA 504.1: EDB, DBCP.
Microbiology: SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, EPA 350.1: Ammonia-N, LACHAT 10-107-06-1-B: Ammonia-N, EPA 351.1, SM4500NO3-F, EPA 353.2: Nitrate-N, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. EPA 200.8: Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. EPA 245.1 Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA ANALYTICAL — World Class Chemistry

Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193
Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 7/18/23

ALPHA Job #: L2340867

Client Information

Client: PESRM c/o Stantec
Address: 1060 Andrew Drive, Suite 140
West Chester, PA 19380
Phone: 610-840-2500
Fax: 610-840-2501
Email: andrew.klingbeil@stantec.com
☐ These samples have been Previously analyzed by Alpha

Project Information

Project Name: PESRM UDEX Release
Project Location: Former PHL Refinery
Project #: 213403039
Project Manager: Andrew Klingbeil
ALPHA Quote #: 21953

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)
Due Date: Time:

Report Information — Data Deliverables

☐ FAX ☒ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program: PA One Cleanup
Criteria:

Other Project Specific Requirements/Comments/Detection Limits:
See quote 21953 and July 14, 2023 email from Andrew K for details on analyses

ANALYSIS

SAMPLE HANDLING
Filtration
☐ Done ☒ Not Needed ☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	PA Volatile Organics 8260C	TPH - GRO, Extended Ranges 8015D	Alkalinity (Carb and Bicarb) 2320B	Chloride,Sulfate,Nitrate 300	Dissolved gases (incl CO2)	Total Ca, Fe, Mg, K, Na 6010D	Sulfide SM 4500	Sample Specific Comments
40867-01	Trip Blank	--	--	TB	--	☒	☐	☐	☐	☐	☐	☐	
02	S-280D_20230717	7/17/23	11:45	GW	BO	☒	☒	☐	☐	☐	☐	☐	
03	S-507_20230717	7/17/23	12:15	GW	JC	☒	☒	☒	☒	☒	☒	☒	
04	S-280_20230717	7/17/23	13:10	GW	BO	☒	☒	☐	☐	☐	☐	☐	
05	C-174_20230717	7/17/23	14:15	GW	BO	☒	☒	☐	☐	☐	☐	☐	
06	S-411_20230717	7/17/23	14:30	GW	JC	☒	☒	☐	☐	☐	☐	☐	
						☐	☐	☐	☐	☐	☐	☐	
						☐	☐	☐	☐	☐	☐	☐	
						☐	☐	☐	☐	☐	☐	☐	
						☐	☐	☐	☐	☐	☐	☐	

Container Type	-	-	-	-	-	-	-	-	-	-	-	-	
Preservative	-	-	-	-	-	-	-	-	-	-	-	-	

Relinquished By:	Date/Time	Received By:	Date/Time
B.S.R.	7/17/23 1600	D. Robinson AAL	7/17/23 1604
D. Robinson AAL	7/17/23 1800		7/17/23 1800
	~~7/17 2345~~	YCN	7/17 2100
YCN	7/17 2345		7/17 2345
	7/18/23 0145		7/18/23 0145

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

FORM NO: 01-01D-NJ (rev. 6-JAN-12)

CHAIN OF CUSTODY

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ALPHA ANALYTICAL — World Class Chemistry

Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193
Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 7/18/23

ALPHA Job #: L2340867

Project Information

Project Name: PESRM UDEX Release
Project Location: Former PHL Refinery
Project #: 213403039
Project Manager: Andrew Klingbeil
ALPHA Quote #: 21953

Report Information — ☐ FAX ☐ ADEx
Data Deliverables — ☒ EMAIL ☐ Add'l Deliverables
Billing Information — ☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program: PA One Cleanup
Criteria:

Client Information

Client: PESRM c/o Stantec
Address: 1060 Andrew Drive, Suite 140
West Chester, PA 19380
Phone: 610-840-2500
Fax: 610-840-2501
Email: andrew.klingbeil@stantec.com
☐ These samples have been Previously analyzed by Alpha

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)
Due Date: Time:

Other Project Specific Requirements/Comments/Detection Limits:
See quote 21953 and July 14, 2023 email from Andrew K for details on analyses

ANALYSIS

SAMPLE HANDLING
Filtration
☐ Done
☒ Not Needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	PA Volatile Organics 8260C	TPH - GRO, Extended Ranges 8015D	Alkalinity (Carb and Bicarb) 2320B	Chloride,Sulfate,Nitrate 300	Dissolved gases (incl CO2)	Total Ca, Fe, Mg, K, Na 6010D	Sulfide SM 4500						Sample Specific Comments
40867-01	Trip Blank	--	--	TB	--	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
02	S-280D_20230717	7/17/23	11:45	GW	BO	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
03	S-507_20230717	7/17/23	12:15	GW	JC	☒	☒	☒	☒	☒	☒	☒	☐	☐	☐	☐	☐	
04	S-280_20230717	7/17/23	13:10	GW	BO	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
05	C-174_20230717	7/17/23	14:15	GW	BO	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
06	S-411_20230717	7/17/23	14:30	GW	JC	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Container Type						-	-	-	-	-	-	-	-	-	-	-	-	
Preservative						-	-	-	-	-	-	-	-	-	-	-	-	

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	7/17/23 16:00	D Robinson AAL	7/17/23 1600
D Robinson AAL	7/17/23 1800	[signature]	7/17/23 1800
[signature]	7/17/23 2100	[signature]	7/17 2100
[signature]	7/17 2345	[signature]	7/17 2345
[signature]	7/18/23 0145	[signature]	7/18/23 0145

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

FORM NO: 01-01(I-NJ) (rev. 9-JAN-12)

SGS

Dayton, NJ

07/24/23

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report



Technical Report for

Alpha Analytical Laboratories, Inc.

Alpha Analytical, PA

L2340867

SGS Job Number: JD69523

Sampling Date: 07/17/23

Report to:

Alpha Analytical Laboratories, Inc.
Eight Walkup Drive
Westborough, MA 01581
subreports@alphalab.com; mvitanza@alphalab.com

ATTN: Marty Vitanza

Total number of pages in report: **13**

NELAP ACCREDITED TNI LABORATORY

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable unless noted in the narrative, comments or footnotes.

David Chastain
General Manager

Client Service contact: Michelle Jenkins 732-329-0200
Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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Test results relate only to samples analyzed.

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EHS.US.CustomerCare@sgs.com

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SGS North America Inc.

Sample Summary

Alpha Analytical Laboratories, Inc.

Job No: JD69523

Alpha Analytical, PA
Project No: L2340867

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JD69523-1	07/17/23	12:15		07/19/23	AQ	Water	S-507_20230717

Summary of Hits

Job Number: JD69523
Account: Alpha Analytical Laboratories, Inc.
Project: Alpha Analytical, PA
Collected: 07/17/23

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JD69523-1	**S-507_20230717**					

No hits reported in this sample.

Sample Results

Report of Analysis

SGS North America Inc.

Report of Analysis

Client Sample ID:	S-507_20230717		
Lab Sample ID:	JD69523-1	**Date Sampled:**	07/17/23
Matrix:	AQ - Water	**Date Received:**	07/19/23
		Percent Solids:	n/a
Project:	Alpha Analytical, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfide	< 2.0	2.0	mg/l	1	07/23/23 15:30	MK	SM4500S2- F-11

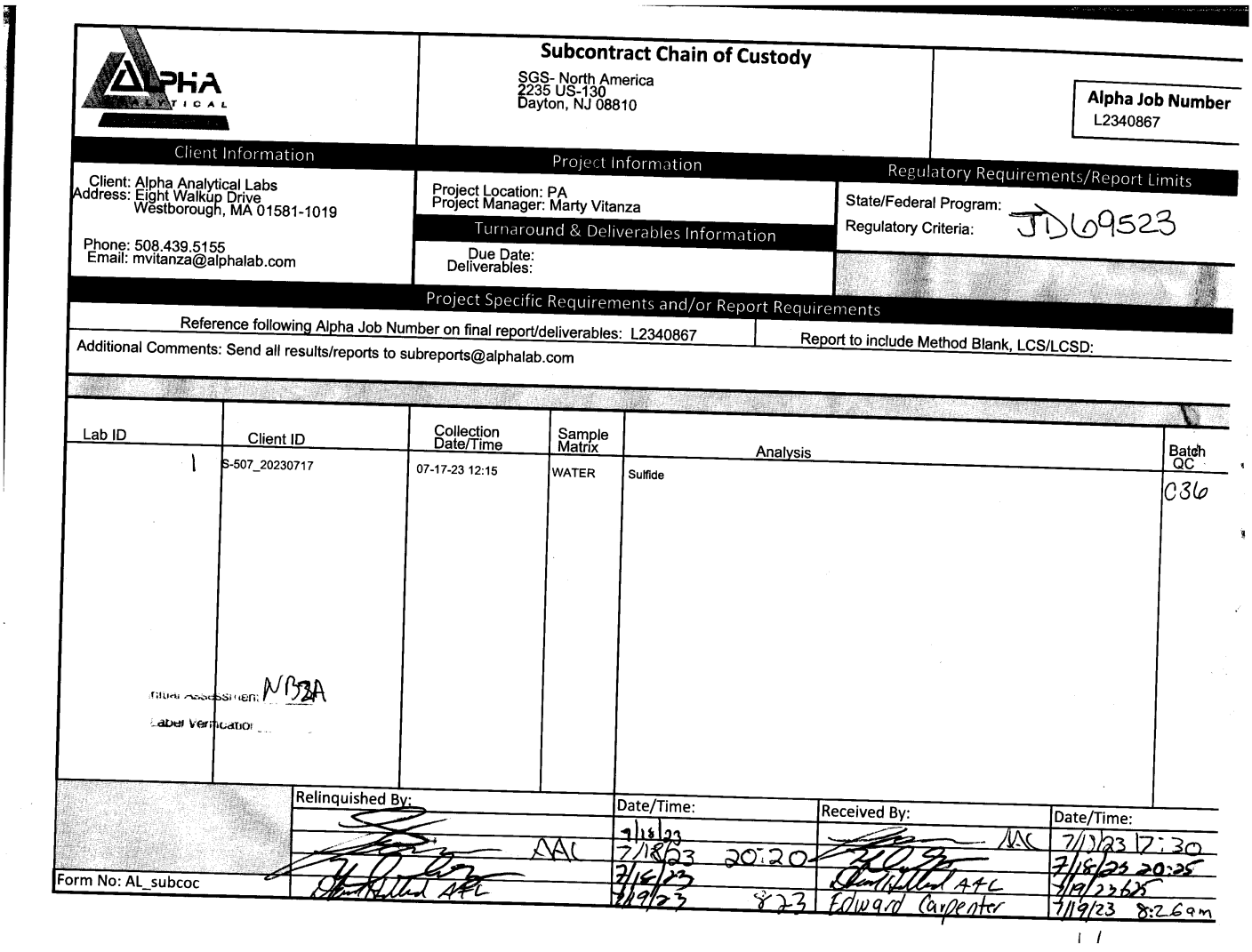
RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



Subcontract Chain of Custody

SGS- North America
2235 US-130
Dayton, NJ 08810

Alpha Job Number
L2340867

Client Information

Client: Alpha Analytical Labs
Address: Eight Walkup Drive
Westborough, MA 01581-1019

Phone: 508.439.5155
Email: mvitanza@alphalab.com

Project Information

Project Location: PA
Project Manager: Marty Vitanza

Turnaround & Deliverables Information

Due Date:
Deliverables:

Regulatory Requirements/Report Limits

State/Federal Program:
Regulatory Criteria: JD69523

Project Specific Requirements and/or Report Requirements

Reference following Alpha Job Number on final report/deliverables: L2340867

Report to include Method Blank, LCS/LCSD:

Additional Comments: Send all results/reports to subreports@alphalab.com

Lab ID	Client ID	Collection Date/Time	Sample Matrix	Analysis	Batch QC
1	S-507_20230717	07-17-23 12:15	WATER	Sulfide	C36

Initial Assessment: NBA

Label Verification:

Relinquished By:	Date/Time:	Received By:	Date/Time:
	7/18/23		
AAL	7/18/23 20:20	AAL	7/19/23 7:30
	7/19/23	AFL	7/19/23 20:25
AFL	7/19/23 823	Edward Carpenter	7/19/23 8:26am

Form No: AL_subcoc

SGS Sample Receipt Summary

Job Number: JD69523 **Client:** ALPHA **Project:** L2340867

Date / Time Received: 7/19/2023 8:26:00 AM **Delivery Method:** CLIENT **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (1.1);

Cooler Temps (Corrected) °C: Cooler 1: (0.8);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	IR Gun 40		
3. Cooler media:	Ice (Bag)		
4. No. Coolers:	1		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☑	☐
2. Trip Blank listed on COC:	☐		☑	☐
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Test Strip Lot #s: pH 1-12: 231619 pH 12+: 203117A Other: (Specify)

Comments

SM089-03
Rev. Date 12/7/17

JD69523: Chain of Custody
Page 2 of 2

5

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: JD69523
Account: ALPHAMAW - Alpha Analytical Laboratories, Inc.
Project: Alpha Analytical, PA

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Sulfide	GN43969	2.0	0.0	mg/l	10.4	10.4	100.0	80-120%
Sulfide	GN43969			mg/l	5.2	5.2	100.0	80-120%

Associated Samples:
Batch GN43969: JD69523-1
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: JD69523
Account: ALPHAMAW - Alpha Analytical Laboratories, Inc.
Project: Alpha Analytical, PA

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Sulfide	GN43969	JD69542-1	mg/l	0.14	0.0	0.0	0-12%

Associated Samples:
Batch GN43969: JD69523-1
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: JD69523
Account: ALPHAMAW - Alpha Analytical Laboratories, Inc.
Project: Alpha Analytical, PA

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Sulfide	GN43969	JD69542-1	mg/l	0.14	3.8	3.6	94.7	37-135%

Associated Samples:
Batch GN43969: JD69523-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

ANALYTICAL REPORT

Lab Number:	L2341099
Client:	Stantec, Inc. 1060 Andrew Drive Suite 140 West Chester, PA 19380
ATTN:	Andrew Klingbeil
Phone:	(610) 840-2525
Project Name:	PESRM UDEX RELEASE
Project Number:	213403039
Report Date:	08/08/23

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341099
Report Date: 08/08/23

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2341099-01	TRIP BLANK	WATER	FORMER PHL REFINERY	07/18/23 00:00	07/18/23
L2341099-02	S-430_20230718	WATER	FORMER PHL REFINERY	07/18/23 08:45	07/18/23
L2341099-03	S-431_20230718	WATER	FORMER PHL REFINERY	07/18/23 10:00	07/18/23
L2341099-04	S-429_20230718	WATER	FORMER PHL REFINERY	07/18/23 11:20	07/18/23
L2341099-05	S-414_20230718	WATER	FORMER PHL REFINERY	07/18/23 12:20	07/18/23
L2341099-06	S-428_20230718	WATER	FORMER PHL REFINERY	07/18/23 13:15	07/18/23
L2341099-07	S-433_20230718	WATER	FORMER PHL REFINERY	07/18/23 14:15	07/18/23

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2341099
Project Number:	213403039	**Report Date:**	08/08/23

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099
Project Number: 213403039 **Report Date:** 08/08/23

Case Narrative (continued)

Report Submission
August 08, 2023: This final report includes the results of all requested analyses.
August 04, 2023: This is a preliminary report.

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

The analysis of Sulfide was subcontracted. A copy of the laboratory report is included as an addendum. Please note: This data is only available in PDF format and is not available on Data Merger.

Volatile Organics by SIM
L2341099-02D, -04D, and -05D: The sample has elevated detection limits due to the dilution required by the elevated concentrations of non-target compounds in the sample.

Dissolved Gases
The WG1805450-5 MS recovery, performed on L2341099-04, is outside the acceptance criteria for carbon dioxide (176%). The unacceptable percent recovery is attributed to the elevated concentration of target compound present in the native sample.

Anions by Ion Chromatography
The WG1805176-3 MS recovery for chloride (61%), performed on L2341099-02, does not apply because the sample concentration is greater than four times the spike amount added.
The WG1805176-4 Laboratory Duplicate RPD for nitrogen, nitrate (61%), performed on L2341099-02, is above the acceptance criteria; however, the sample and duplicate results are less than five times the reporting limit. Therefore, the RPD is valid.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Kelly Stenstrom

Title: Technical Director/Representative Date: 08/08/23

ORGANICS

VOLATILES

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-01 Date Collected: 07/18/23 00:00
Client ID: TRIP BLANK Date Received: 07/18/23
Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/26/23 12:10
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	5.0	0.24	1
Chloromethane	ND		ug/l	2.5	0.20	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Bromomethane	ND		ug/l	1.0	0.26	1
Chloroethane	ND		ug/l	1.0	0.13	1
Trichlorofluoromethane	ND		ug/l	2.5	0.16	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
Carbon disulfide	ND		ug/l	5.0	0.30	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15	1
Methylene chloride	ND		ug/l	2.5	0.68	1
Acetone	ND		ug/l	5.0	1.5	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16	1
Methyl Acetate	ND		ug/l	2.0	0.23	1
Methyl tert butyl ether	ND		ug/l	1.0	0.17	1
1,1-Dichloroethane	ND		ug/l	0.75	0.21	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16	1
Cyclohexane	ND		ug/l	10	0.27	1
Bromochloromethane	ND		ug/l	2.5	0.15	1
Chloroform	ND		ug/l	0.75	0.22	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16	1
2-Butanone	ND		ug/l	5.0	1.9	1
Benzene	ND		ug/l	0.50	0.16	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
Methyl cyclohexane	ND		ug/l	10	0.40	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-01 Date Collected: 07/18/23 00:00

Client ID: TRIP BLANK Date Received: 07/18/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	0.50	0.19	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
Toluene	ND		ug/l	0.75	0.20	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,2-Dibromoethane	ND		ug/l	2.0	0.19	1
2-Hexanone	ND		ug/l	5.0	0.52	1
Chlorobenzene	ND		ug/l	0.50	0.18	1
Ethylbenzene	ND		ug/l	0.50	0.17	1
p/m-Xylene	ND		ug/l	1.0	0.33	1
o-Xylene	ND		ug/l	1.0	0.39	1
Xylenes, Total	ND		ug/l	1.0	0.33	1
Styrene	ND		ug/l	1.0	0.36	1
Bromoform	ND		ug/l	2.0	0.25	1
Isopropylbenzene	ND		ug/l	0.50	0.19	1
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	100		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	95		70-130
Dibromofluoromethane	99		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-01 Date Collected: 07/18/23 00:00

Client ID: TRIP BLANK Date Received: 07/18/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Matrix: Water

Analytical Method: 1,8260D-SIM(M)

Analytical Date: 07/26/23 12:10

Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	1.1	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	97		70-130
4-Bromofluorobenzene	91		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-02
Client ID: S-430_20230718
Sample Location: FORMER PHL REFINERY
Date Collected: 07/18/23 08:45
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/20/23 10:21
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	90.5		mg/l	3.00	3.00	1

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-02
Client ID: S-430_20230718
Sample Location: FORMER PHL REFINERY
Date Collected: 07/18/23 08:45
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/25/23 11:35
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	4560		ug/l	2.00	2.00	1	A
Ethene	ND		ug/l	0.500	0.500	1	A
Ethane	ND		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-02 D
Client ID: S-430_20230718
Sample Location: FORMER PHL REFINERY

Date Collected: 07/18/23 08:45
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/27/23 14:02
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	120	6.1	25
Chloromethane	ND		ug/l	62	5.0	25
Vinyl chloride	ND		ug/l	25	1.8	25
Bromomethane	ND		ug/l	25	6.4	25
Chloroethane	ND		ug/l	25	3.4	25
Trichlorofluoromethane	ND		ug/l	62	4.0	25
1,1-Dichloroethene	ND		ug/l	12	4.2	25
Carbon disulfide	ND		ug/l	120	7.5	25
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	62	3.7	25
Methylene chloride	ND		ug/l	62	17.	25
Acetone	ND		ug/l	120	36.	25
trans-1,2-Dichloroethene	ND		ug/l	19	4.1	25
Methyl Acetate	ND		ug/l	50	5.8	25
Methyl tert butyl ether	ND		ug/l	25	4.2	25
1,1-Dichloroethane	ND		ug/l	19	5.2	25
cis-1,2-Dichloroethene	ND		ug/l	12	4.7	25
1,2-Dichloroethene, Total	ND		ug/l	12	4.1	25
Cyclohexane	90	J	ug/l	250	6.8	25
Bromochloromethane	ND		ug/l	62	3.8	25
Chloroform	ND		ug/l	19	5.6	25
Carbon tetrachloride	ND		ug/l	12	3.4	25
1,1,1-Trichloroethane	ND		ug/l	12	4.0	25
2-Butanone	ND		ug/l	120	48.	25
Benzene	4200		ug/l	12	4.0	25
1,2-Dichloroethane	ND		ug/l	12	3.3	25
Methyl cyclohexane	16	J	ug/l	250	9.9	25
Trichloroethene	ND		ug/l	12	4.4	25
1,2-Dichloropropane	ND		ug/l	25	3.4	25

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-02 D Date Collected: 07/18/23 08:45

Client ID: S-430_20230718 Date Received: 07/18/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	12	4.8	25
cis-1,3-Dichloropropene	ND		ug/l	12	3.6	25
Toluene	1800		ug/l	19	5.1	25
Tetrachloroethene	ND		ug/l	12	4.5	25
4-Methyl-2-pentanone	ND		ug/l	120	10.	25
trans-1,3-Dichloropropene	ND		ug/l	12	4.1	25
1,3-Dichloropropene, Total	ND		ug/l	12	3.6	25
1,1,2-Trichloroethane	ND		ug/l	19	3.6	25
Dibromochloromethane	ND		ug/l	12	3.7	25
1,2-Dibromoethane	ND		ug/l	50	4.8	25
2-Hexanone	ND		ug/l	120	13.	25
Chlorobenzene	ND		ug/l	12	4.4	25
Ethylbenzene	16		ug/l	12	4.2	25
p/m-Xylene	40		ug/l	25	8.3	25
o-Xylene	ND		ug/l	25	9.8	25
Xylenes, Total	40		ug/l	25	8.3	25
Styrene	ND		ug/l	25	9.0	25
Bromoform	ND		ug/l	50	6.2	25
Isopropylbenzene	ND		ug/l	12	4.7	25
1,3-Dichlorobenzene	ND		ug/l	62	4.6	25
1,4-Dichlorobenzene	ND		ug/l	62	4.7	25
1,2-Dichlorobenzene	ND		ug/l	62	4.6	25
1,2-Dibromo-3-chloropropane	ND		ug/l	62	8.8	25
1,2,4-Trichlorobenzene	ND		ug/l	62	5.5	25
1,2,3-Trichlorobenzene	ND		ug/l	62	5.8	25

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	87		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	95		70-130
Dibromofluoromethane	85		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-02 D
Client ID: S-430_20230718
Sample Location: FORMER PHL REFINERY

Date Collected: 07/18/23 08:45
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/26/23 13:32
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	75	27.	25
1,1,2,2-Tetrachloroethane	ND		ug/l	1.25	0.142	25

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	89		70-130
4-Bromofluorobenzene	92		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-03
Client ID: S-431_20230718
Sample Location: FORMER PHL REFINERY
Date Collected: 07/18/23 10:00
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/26/23 14:27
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	5.0	0.24	1
Chloromethane	ND		ug/l	2.5	0.20	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Bromomethane	ND		ug/l	1.0	0.26	1
Chloroethane	ND		ug/l	1.0	0.13	1
Trichlorofluoromethane	ND		ug/l	2.5	0.16	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
Carbon disulfide	ND		ug/l	5.0	0.30	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15	1
Methylene chloride	ND		ug/l	2.5	0.68	1
Acetone	ND		ug/l	5.0	1.5	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16	1
Methyl Acetate	ND		ug/l	2.0	0.23	1
Methyl tert butyl ether	ND		ug/l	1.0	0.17	1
1,1-Dichloroethane	ND		ug/l	0.75	0.21	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16	1
Cyclohexane	39		ug/l	10	0.27	1
Bromochloromethane	ND		ug/l	2.5	0.15	1
Chloroform	ND		ug/l	0.75	0.22	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16	1
2-Butanone	ND		ug/l	5.0	1.9	1
Benzene	23		ug/l	0.50	0.16	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
Methyl cyclohexane	9.0	J	ug/l	10	0.40	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-03 Date Collected: 07/18/23 10:00

Client ID: S-431_20230718 Date Received: 07/18/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	0.50	0.19	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
Toluene	3.9		ug/l	0.75	0.20	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,2-Dibromoethane	ND		ug/l	2.0	0.19	1
2-Hexanone	ND		ug/l	5.0	0.52	1
Chlorobenzene	ND		ug/l	0.50	0.18	1
Ethylbenzene	ND		ug/l	0.50	0.17	1
p/m-Xylene	0.90	J	ug/l	1.0	0.33	1
o-Xylene	ND		ug/l	1.0	0.39	1
Xylenes, Total	0.90	J	ug/l	1.0	0.33	1
Styrene	ND		ug/l	1.0	0.36	1
Bromoform	ND		ug/l	2.0	0.25	1
Isopropylbenzene	1.1		ug/l	0.50	0.19	1
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	89		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	96		70-130
Dibromofluoromethane	86		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-03 Date Collected: 07/18/23 10:00
Client ID: S-431_20230718 Date Received: 07/18/23
Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/26/23 14:27
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	1.1	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	90		70-130
4-Bromofluorobenzene	93		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-03
Client ID: S-431_20230718
Sample Location: FORMER PHL REFINERY

Date Collected: 07/18/23 10:00
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/20/23 10:39
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	65.2		mg/l	3.00	3.00	1

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-03
Client ID: S-431_20230718
Sample Location: FORMER PHL REFINERY
Date Collected: 07/18/23 10:00
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/25/23 11:53
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	330		ug/l	2.00	2.00	1	A
Ethene	ND		ug/l	0.500	0.500	1	A
Ethane	ND		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-04
Client ID: S-429_20230718
Sample Location: FORMER PHL REFINERY
Date Collected: 07/18/23 11:20
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/20/23 10:57
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	47.0		mg/l	3.00	3.00	1

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-04
Client ID: S-429_20230718
Sample Location: FORMER PHL REFINERY
Date Collected: 07/18/23 11:20
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/25/23 12:11
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	7130		ug/l	2.00	2.00	1	A
Ethene	ND		ug/l	0.500	0.500	1	A
Ethane	ND		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-04 D
Client ID: S-429_20230718
Sample Location: FORMER PHL REFINERY

Date Collected: 07/18/23 11:20
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/26/23 12:37
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	10000	490	2000
Chloromethane	ND		ug/l	5000	400	2000
Vinyl chloride	ND		ug/l	2000	140	2000
Bromomethane	ND		ug/l	2000	510	2000
Chloroethane	ND		ug/l	2000	270	2000
Trichlorofluoromethane	ND		ug/l	5000	320	2000
1,1-Dichloroethene	ND		ug/l	1000	340	2000
Carbon disulfide	ND		ug/l	10000	600	2000
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	5000	300	2000
Methylene chloride	ND		ug/l	5000	1400	2000
Acetone	ND		ug/l	10000	2900	2000
trans-1,2-Dichloroethene	ND		ug/l	1500	330	2000
Methyl Acetate	ND		ug/l	4000	470	2000
Methyl tert butyl ether	ND		ug/l	2000	330	2000
1,1-Dichloroethane	ND		ug/l	1500	420	2000
cis-1,2-Dichloroethene	ND		ug/l	1000	370	2000
1,2-Dichloroethene, Total	ND		ug/l	1000	330	2000
Cyclohexane	ND		ug/l	20000	540	2000
Bromochloromethane	ND		ug/l	5000	300	2000
Chloroform	ND		ug/l	1500	440	2000
Carbon tetrachloride	ND		ug/l	1000	270	2000
1,1,1-Trichloroethane	ND		ug/l	1000	320	2000
2-Butanone	ND		ug/l	10000	3900	2000
Benzene	230000		ug/l	1000	320	2000
1,2-Dichloroethane	ND		ug/l	1000	260	2000
Methyl cyclohexane	ND		ug/l	20000	790	2000
Trichloroethene	ND		ug/l	1000	350	2000
1,2-Dichloropropane	ND		ug/l	2000	270	2000

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-04 D Date Collected: 07/18/23 11:20

Client ID: S-429_20230718 Date Received: 07/18/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	1000	380	2000
cis-1,3-Dichloropropene	ND		ug/l	1000	290	2000
Toluene	32000		ug/l	1500	410	2000
Tetrachloroethene	ND		ug/l	1000	360	2000
4-Methyl-2-pentanone	ND		ug/l	10000	830	2000
trans-1,3-Dichloropropene	ND		ug/l	1000	330	2000
1,3-Dichloropropene, Total	ND		ug/l	1000	290	2000
1,1,2-Trichloroethane	ND		ug/l	1500	290	2000
Dibromochloromethane	ND		ug/l	1000	300	2000
1,2-Dibromoethane	ND		ug/l	4000	390	2000
2-Hexanone	ND		ug/l	10000	1000	2000
Chlorobenzene	ND		ug/l	1000	360	2000
Ethylbenzene	ND		ug/l	1000	330	2000
p/m-Xylene	ND		ug/l	2000	660	2000
o-Xylene	ND		ug/l	2000	780	2000
Xylenes, Total	ND		ug/l	2000	660	2000
Styrene	ND		ug/l	2000	720	2000
Bromoform	ND		ug/l	4000	500	2000
Isopropylbenzene	ND		ug/l	1000	370	2000
1,3-Dichlorobenzene	ND		ug/l	5000	370	2000
1,4-Dichlorobenzene	ND		ug/l	5000	370	2000
1,2-Dichlorobenzene	ND		ug/l	5000	370	2000
1,2-Dibromo-3-chloropropane	ND		ug/l	5000	710	2000
1,2,4-Trichlorobenzene	ND		ug/l	5000	440	2000
1,2,3-Trichlorobenzene	ND		ug/l	5000	470	2000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	96		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	94		70-130
Dibromofluoromethane	93		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-04 D
Client ID: S-429_20230718
Sample Location: FORMER PHL REFINERY

Date Collected: 07/18/23 11:20
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/26/23 12:37
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	6000	2100	2000
1,1,2,2-Tetrachloroethane	ND		ug/l	100	11.4	2000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	93		70-130
4-Bromofluorobenzene	92		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-05
Client ID: S-414_20230718
Sample Location: FORMER PHL REFINERY

Date Collected: 07/18/23 12:20
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/20/23 11:15
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	91.0		mg/l	3.00	3.00	1

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-05
Client ID: S-414_20230718
Sample Location: FORMER PHL REFINERY
Date Collected: 07/18/23 12:20
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/25/23 16:47
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	3440		ug/l	2.00	2.00	1	A
Ethene	0.878		ug/l	0.500	0.500	1	A
Ethane	1.48		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-05 D2
Client ID: S-414_20230718
Sample Location: FORMER PHL REFINERY

Date Collected: 07/18/23 12:20
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/27/23 13:35
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Benzene	450000		ug/l	2500	800	5000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	92		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	94		70-130
Dibromofluoromethane	97		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-05 D
Client ID: S-414_20230718
Sample Location: FORMER PHL REFINERY

Date Collected: 07/18/23 12:20
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/26/23 13:05
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	5000	240	1000
Chloromethane	ND		ug/l	2500	200	1000
Vinyl chloride	ND		ug/l	1000	71.	1000
Bromomethane	ND		ug/l	1000	260	1000
Chloroethane	ND		ug/l	1000	130	1000
Trichlorofluoromethane	ND		ug/l	2500	160	1000
1,1-Dichloroethene	ND		ug/l	500	170	1000
Carbon disulfide	ND		ug/l	5000	300	1000
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2500	150	1000
Methylene chloride	ND		ug/l	2500	680	1000
Acetone	ND		ug/l	5000	1500	1000
trans-1,2-Dichloroethene	ND		ug/l	750	160	1000
Methyl Acetate	ND		ug/l	2000	230	1000
Methyl tert butyl ether	ND		ug/l	1000	170	1000
1,1-Dichloroethane	ND		ug/l	750	210	1000
cis-1,2-Dichloroethene	ND		ug/l	500	190	1000
1,2-Dichloroethene, Total	ND		ug/l	500	160	1000
Cyclohexane	380	J	ug/l	10000	270	1000
Bromochloromethane	ND		ug/l	2500	150	1000
Chloroform	ND		ug/l	750	220	1000
Carbon tetrachloride	ND		ug/l	500	130	1000
1,1,1-Trichloroethane	ND		ug/l	500	160	1000
2-Butanone	ND		ug/l	5000	1900	1000
Benzene	470000	E	ug/l	500	160	1000
1,2-Dichloroethane	ND		ug/l	500	130	1000
Methyl cyclohexane	ND		ug/l	10000	400	1000
Trichloroethene	ND		ug/l	500	180	1000
1,2-Dichloropropane	ND		ug/l	1000	140	1000

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-05 D Date Collected: 07/18/23 12:20

Client ID: S-414_20230718 Date Received: 07/18/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	500	190	1000
cis-1,3-Dichloropropene	ND		ug/l	500	140	1000
Toluene	61000		ug/l	750	200	1000
Tetrachloroethene	ND		ug/l	500	180	1000
4-Methyl-2-pentanone	ND		ug/l	5000	420	1000
trans-1,3-Dichloropropene	ND		ug/l	500	160	1000
1,3-Dichloropropene, Total	ND		ug/l	500	140	1000
1,1,2-Trichloroethane	ND		ug/l	750	140	1000
Dibromochloromethane	ND		ug/l	500	150	1000
1,2-Dibromoethane	ND		ug/l	2000	190	1000
2-Hexanone	ND		ug/l	5000	520	1000
Chlorobenzene	ND		ug/l	500	180	1000
Ethylbenzene	ND		ug/l	500	170	1000
p/m-Xylene	ND		ug/l	1000	330	1000
o-Xylene	ND		ug/l	1000	390	1000
Xylenes, Total	ND		ug/l	1000	330	1000
Styrene	ND		ug/l	1000	360	1000
Bromoform	ND		ug/l	2000	250	1000
Isopropylbenzene	ND		ug/l	500	190	1000
1,3-Dichlorobenzene	ND		ug/l	2500	190	1000
1,4-Dichlorobenzene	ND		ug/l	2500	190	1000
1,2-Dichlorobenzene	ND		ug/l	2500	180	1000
1,2-Dibromo-3-chloropropane	ND		ug/l	2500	350	1000
1,2,4-Trichlorobenzene	ND		ug/l	2500	220	1000
1,2,3-Trichlorobenzene	ND		ug/l	2500	230	1000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	90		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	92		70-130
Dibromofluoromethane	91		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-05 D
Client ID: S-414_20230718
Sample Location: FORMER PHL REFINERY

Date Collected: 07/18/23 12:20
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/26/23 13:05
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3000	1100	1000
1,1,2,2-Tetrachloroethane	ND		ug/l	50.0	5.70	1000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	87		70-130
4-Bromofluorobenzene	91		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-06
Client ID: S-428_20230718
Sample Location: FORMER PHL REFINERY
Date Collected: 07/18/23 13:15
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/27/23 14:30
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	5.0	0.24	1
Chloromethane	ND		ug/l	2.5	0.20	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Bromomethane	ND		ug/l	1.0	0.26	1
Chloroethane	ND		ug/l	1.0	0.13	1
Trichlorofluoromethane	ND		ug/l	2.5	0.16	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
Carbon disulfide	ND		ug/l	5.0	0.30	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15	1
Methylene chloride	ND		ug/l	2.5	0.68	1
Acetone	ND		ug/l	5.0	1.5	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16	1
Methyl Acetate	ND		ug/l	2.0	0.23	1
Methyl tert butyl ether	ND		ug/l	1.0	0.17	1
1,1-Dichloroethane	ND		ug/l	0.75	0.21	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16	1
Cyclohexane	5.6	J	ug/l	10	0.27	1
Bromochloromethane	ND		ug/l	2.5	0.15	1
Chloroform	ND		ug/l	0.75	0.22	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16	1
2-Butanone	ND		ug/l	5.0	1.9	1
Benzene	98		ug/l	0.50	0.16	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
Methyl cyclohexane	8.8	J	ug/l	10	0.40	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-06 Date Collected: 07/18/23 13:15

Client ID: S-428_20230718 Date Received: 07/18/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	0.50	0.19	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
Toluene	15		ug/l	0.75	0.20	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,2-Dibromoethane	ND		ug/l	2.0	0.19	1
2-Hexanone	ND		ug/l	5.0	0.52	1
Chlorobenzene	ND		ug/l	0.50	0.18	1
Ethylbenzene	ND		ug/l	0.50	0.17	1
p/m-Xylene	ND		ug/l	1.0	0.33	1
o-Xylene	ND		ug/l	1.0	0.39	1
Xylenes, Total	ND		ug/l	1.0	0.33	1
Styrene	ND		ug/l	1.0	0.36	1
Bromoform	ND		ug/l	2.0	0.25	1
Isopropylbenzene	5.8		ug/l	0.50	0.19	1
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	88		70-130
Toluene-d8	105		70-130
4-Bromofluorobenzene	98		70-130
Dibromofluoromethane	89		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-06
Client ID: S-428_20230718
Sample Location: FORMER PHL REFINERY
Date Collected: 07/18/23 13:15
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/27/23 14:30
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	1.1	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	86		70-130
4-Bromofluorobenzene	94		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-06
Client ID: S-428_20230718
Sample Location: FORMER PHL REFINERY

Date Collected: 07/18/23 13:15
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/20/23 11:33
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	76.3		mg/l	3.00	3.00	1

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-06
Client ID: S-428_20230718
Sample Location: FORMER PHL REFINERY
Date Collected: 07/18/23 13:15
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/25/23 17:04
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	4060		ug/l	2.00	2.00	1	A
Ethene	0.716		ug/l	0.500	0.500	1	A
Ethane	ND		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-07 Date Collected: 07/18/23 14:15
Client ID: S-433_20230718 Date Received: 07/18/23
Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/26/23 14:55
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	5.0	0.24	1
Chloromethane	ND		ug/l	2.5	0.20	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Bromomethane	ND		ug/l	1.0	0.26	1
Chloroethane	ND		ug/l	1.0	0.13	1
Trichlorofluoromethane	ND		ug/l	2.5	0.16	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
Carbon disulfide	ND		ug/l	5.0	0.30	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15	1
Methylene chloride	ND		ug/l	2.5	0.68	1
Acetone	ND		ug/l	5.0	1.5	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16	1
Methyl Acetate	ND		ug/l	2.0	0.23	1
Methyl tert butyl ether	ND		ug/l	1.0	0.17	1
1,1-Dichloroethane	ND		ug/l	0.75	0.21	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16	1
Cyclohexane	ND		ug/l	10	0.27	1
Bromochloromethane	ND		ug/l	2.5	0.15	1
Chloroform	ND		ug/l	0.75	0.22	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16	1
2-Butanone	ND		ug/l	5.0	1.9	1
Benzene	21		ug/l	0.50	0.16	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
Methyl cyclohexane	ND		ug/l	10	0.40	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-07 Date Collected: 07/18/23 14:15

Client ID: S-433_20230718 Date Received: 07/18/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	0.50	0.19	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
Toluene	3.8		ug/l	0.75	0.20	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,2-Dibromoethane	ND		ug/l	2.0	0.19	1
2-Hexanone	ND		ug/l	5.0	0.52	1
Chlorobenzene	ND		ug/l	0.50	0.18	1
Ethylbenzene	ND		ug/l	0.50	0.17	1
p/m-Xylene	ND		ug/l	1.0	0.33	1
o-Xylene	ND		ug/l	1.0	0.39	1
Xylenes, Total	ND		ug/l	1.0	0.33	1
Styrene	ND		ug/l	1.0	0.36	1
Bromoform	ND		ug/l	2.0	0.25	1
Isopropylbenzene	ND		ug/l	0.50	0.19	1
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	90		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	96		70-130
Dibromofluoromethane	89		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-07 Date Collected: 07/18/23 14:15
Client ID: S-433_20230718 Date Received: 07/18/23
Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/26/23 14:55
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	1.1	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	92		70-130
4-Bromofluorobenzene	92		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-07
Client ID: S-433_20230718
Sample Location: FORMER PHL REFINERY
Date Collected: 07/18/23 14:15
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/20/23 11:51
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	94.5		mg/l	3.00	3.00	1

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-07
Client ID: S-433_20230718
Sample Location: FORMER PHL REFINERY
Date Collected: 07/18/23 14:15
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/25/23 17:40
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	2290		ug/l	2.00	2.00	1	A
Ethene	ND		ug/l	0.500	0.500	1	A
Ethane	ND		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341099
Report Date: 08/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 117,-
Analytical Date: 07/20/23 09:43
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL
Dissolved Gases by GC - Mansfield Lab for sample(s): 02-07 Batch: WG1805450-3					
Carbon Dioxide	ND		mg/l	3.00	3.00

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341099
Report Date: 08/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 117,-
Analytical Date: 07/25/23 09:43
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	
Dissolved Gases by GC - Mansfield Lab for sample(s): 02-07 Batch: WG1807392-3						
Methane	ND		ug/l	2.00	2.00	A
Ethene	ND		ug/l	0.500	0.500	A
Ethane	ND		ug/l	0.500	0.500	A

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/26/23 05:45
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01,03-05,07 Batch: WG1808273-5					
Dichlorodifluoromethane	ND		ug/l	5.0	0.24
Chloromethane	ND		ug/l	2.5	0.20
Vinyl chloride	ND		ug/l	1.0	0.07
Bromomethane	ND		ug/l	1.0	0.26
Chloroethane	ND		ug/l	1.0	0.13
Trichlorofluoromethane	ND		ug/l	2.5	0.16
1,1-Dichloroethene	ND		ug/l	0.50	0.17
Carbon disulfide	ND		ug/l	5.0	0.30
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15
Methylene chloride	ND		ug/l	2.5	0.68
Acetone	ND		ug/l	5.0	1.5
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16
Methyl Acetate	ND		ug/l	2.0	0.23
Methyl tert butyl ether	ND		ug/l	1.0	0.17
1,1-Dichloroethane	ND		ug/l	0.75	0.21
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16
Cyclohexane	ND		ug/l	10	0.27
Bromochloromethane	ND		ug/l	2.5	0.15
Chloroform	ND		ug/l	0.75	0.22
Carbon tetrachloride	ND		ug/l	0.50	0.13
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16
2-Butanone	ND		ug/l	5.0	1.9
Benzene	ND		ug/l	0.50	0.16
1,2-Dichloroethane	ND		ug/l	0.50	0.13
Methyl cyclohexane	ND		ug/l	10	0.40
Trichloroethene	ND		ug/l	0.50	0.18
1,2-Dichloropropane	ND		ug/l	1.0	0.14
Bromodichloromethane	ND		ug/l	0.50	0.19

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/26/23 05:45
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01,03-05,07 Batch: WG1808273-5					
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14
Toluene	ND		ug/l	0.75	0.20
Tetrachloroethene	ND		ug/l	0.50	0.18
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14
Dibromochloromethane	ND		ug/l	0.50	0.15
1,2-Dibromoethane	ND		ug/l	2.0	0.19
2-Hexanone	ND		ug/l	5.0	0.52
Chlorobenzene	ND		ug/l	0.50	0.18
Ethylbenzene	ND		ug/l	0.50	0.17
p/m-Xylene	ND		ug/l	1.0	0.33
o-Xylene	ND		ug/l	1.0	0.39
Xylenes, Total	ND		ug/l	1.0	0.33
Styrene	ND		ug/l	1.0	0.36
Bromoform	ND		ug/l	2.0	0.25
Isopropylbenzene	ND		ug/l	0.50	0.19
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341099
Report Date: 08/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/26/23 05:45
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01,03-05,07 Batch: WG1808273-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	93		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	93		70-130
Dibromofluoromethane	98		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/26/23 05:45
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01-05,07 Batch: WG1808274-5					
1,4-Dioxane	ND		ug/l	3.0	1.1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	93		70-130
4-Bromofluorobenzene	91		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/27/23 05:47
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02,05-06 Batch: WG1808860-5					
Dichlorodifluoromethane	ND		ug/l	5.0	0.24
Chloromethane	ND		ug/l	2.5	0.20
Vinyl chloride	ND		ug/l	1.0	0.07
Bromomethane	ND		ug/l	1.0	0.26
Chloroethane	ND		ug/l	1.0	0.13
Trichlorofluoromethane	ND		ug/l	2.5	0.16
1,1-Dichloroethene	ND		ug/l	0.50	0.17
Carbon disulfide	ND		ug/l	5.0	0.30
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15
Methylene chloride	ND		ug/l	2.5	0.68
Acetone	ND		ug/l	5.0	1.5
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16
Methyl Acetate	ND		ug/l	2.0	0.23
Methyl tert butyl ether	ND		ug/l	1.0	0.17
1,1-Dichloroethane	ND		ug/l	0.75	0.21
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16
Cyclohexane	ND		ug/l	10	0.27
Bromochloromethane	ND		ug/l	2.5	0.15
Chloroform	ND		ug/l	0.75	0.22
Carbon tetrachloride	ND		ug/l	0.50	0.13
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16
2-Butanone	ND		ug/l	5.0	1.9
Benzene	ND		ug/l	0.50	0.16
1,2-Dichloroethane	ND		ug/l	0.50	0.13
Methyl cyclohexane	ND		ug/l	10	0.40
Trichloroethene	ND		ug/l	0.50	0.18
1,2-Dichloropropane	ND		ug/l	1.0	0.14
Bromodichloromethane	ND		ug/l	0.50	0.19

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/27/23 05:47
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02,05-06 Batch: WG1808860-5					
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14
Toluene	ND		ug/l	0.75	0.20
Tetrachloroethene	ND		ug/l	0.50	0.18
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14
Dibromochloromethane	ND		ug/l	0.50	0.15
1,2-Dibromoethane	ND		ug/l	2.0	0.19
2-Hexanone	ND		ug/l	5.0	0.52
Chlorobenzene	ND		ug/l	0.50	0.18
Ethylbenzene	ND		ug/l	0.50	0.17
p/m-Xylene	ND		ug/l	1.0	0.33
o-Xylene	ND		ug/l	1.0	0.39
Xylenes, Total	ND		ug/l	1.0	0.33
Styrene	ND		ug/l	1.0	0.36
Bromoform	ND		ug/l	2.0	0.25
Isopropylbenzene	ND		ug/l	0.50	0.19
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/27/23 05:47
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02,05-06 Batch: WG1808860-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	96		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	95		70-130
Dibromofluoromethane	96		70-130

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341099
Report Date: 08/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/27/23 05:47
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 06 Batch: WG1808869-5					
1,4-Dioxane	ND		ug/l	3.0	1.1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	94		70-130
4-Bromofluorobenzene	92		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341099

Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Dissolved Gases by GC - Mansfield Lab Associated sample(s): 02-07 Batch: WG1805450-2								
Carbon Dioxide	93		-		80-120	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341099

Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Dissolved Gases by GC - Mansfield Lab Associated sample(s): 02-07 Batch: WG1807392-2									
Methane	106		-		80-120	-		25	A
Ethene	100		-		80-120	-		25	A
Ethane	100		-		80-120	-		25	A

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341099
Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01,03-05,07 Batch: WG1808273-3 WG1808273-4								
Dichlorodifluoromethane	130		130		36-147	0		20
Chloromethane	110		110		64-130	0		20
Vinyl chloride	120		120		55-140	0		20
Bromomethane	91		100		39-139	9		20
Chloroethane	96		100		55-138	4		20
Trichlorofluoromethane	100		100		62-150	0		20
1,1-Dichloroethene	110		110		61-145	0		20
Carbon disulfide	100		100		51-130	0		20
1,1,2-Trichloro-1,2,2-Trifluoroethane	120		120		70-130	0		20
Methylene chloride	100		100		70-130	0		20
Acetone	120		110		58-148	9		20
trans-1,2-Dichloroethene	110		110		70-130	0		20
Methyl Acetate	110		120		70-130	9		20
Methyl tert butyl ether	110		100		63-130	10		20
1,1-Dichloroethane	110		110		70-130	0		20
cis-1,2-Dichloroethene	100		100		70-130	0		20
Cyclohexane	110		110		70-130	0		20
Bromochloromethane	110		100		70-130	10		20
Chloroform	100		110		70-130	10		20
Carbon tetrachloride	110		110		63-132	0		20
1,1,1-Trichloroethane	110		110		67-130	0		20
2-Butanone	100		100		63-138	0		20
Benzene	100		100		70-130	0		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341099
Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01,03-05,07 Batch: WG1808273-3 WG1808273-4								
1,2-Dichloroethane	110		110		70-130	0		20
Methyl cyclohexane	110		110		70-130	0		20
Trichloroethene	110		110		70-130	0		20
1,2-Dichloropropane	100		100		70-130	0		20
Bromodichloromethane	100		100		67-130	0		20
cis-1,3-Dichloropropene	96		98		70-130	2		20
Toluene	110		110		70-130	0		20
Tetrachloroethene	120		120		70-130	0		20
4-Methyl-2-pentanone	92		88		59-130	4		20
trans-1,3-Dichloropropene	100		100		70-130	0		20
1,1,2-Trichloroethane	110		110		70-130	0		20
Dibromochloromethane	100		100		63-130	0		20
1,2-Dibromoethane	100		110		70-130	10		20
2-Hexanone	92		95		57-130	3		20
Chlorobenzene	110		100		75-130	10		20
Ethylbenzene	110		110		70-130	0		20
p/m-Xylene	105		105		70-130	0		20
o-Xylene	105		105		70-130	0		20
Styrene	105		105		70-130	0		20
Bromoform	100		95		54-136	5		20
Isopropylbenzene	110		110		70-130	0		20
1,3-Dichlorobenzene	110		110		70-130	0		20
1,4-Dichlorobenzene	110		110		70-130	0		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341099

Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01,03-05,07 Batch: WG1808273-3 WG1808273-4								
1,2-Dichlorobenzene	110		110		70-130	0		20
1,2-Dibromo-3-chloropropane	99		100		41-144	1		20
1,2,4-Trichlorobenzene	120		110		70-130	9		20
1,2,3-Trichlorobenzene	120		120		70-130	0		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	88		94		70-130
Toluene-d8	97		97		70-130
4-Bromofluorobenzene	95		96		70-130
Dibromofluoromethane	92		91		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341099

Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-05,07 Batch: WG1808274-3 WG1808274-4								
1,4-Dioxane	97		120		70-130	21		25
1,1,2,2-Tetrachloroethane	112		105		70-130	6		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	94		94		70-130
4-Bromofluorobenzene	91		91		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341099
Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02,05-06 Batch: WG1808860-3 WG1808860-4								
Dichlorodifluoromethane	120		130		36-147	8		20
Chloromethane	110		110		64-130	0		20
Vinyl chloride	120		120		55-140	0		20
Bromomethane	100		100		39-139	0		20
Chloroethane	96		97		55-138	1		20
Trichlorofluoromethane	110		110		62-150	0		20
1,1-Dichloroethene	110		100		61-145	10		20
Carbon disulfide	100		100		51-130	0		20
1,1,2-Trichloro-1,2,2-Trifluoroethane	110		120		70-130	9		20
Methylene chloride	100		100		70-130	0		20
Acetone	120		120		58-148	0		20
trans-1,2-Dichloroethene	110		100		70-130	10		20
Methyl Acetate	120		120		70-130	0		20
Methyl tert butyl ether	110		110		63-130	0		20
1,1-Dichloroethane	110		110		70-130	0		20
cis-1,2-Dichloroethene	100		100		70-130	0		20
Cyclohexane	110		110		70-130	0		20
Bromochloromethane	110		110		70-130	0		20
Chloroform	100		110		70-130	10		20
Carbon tetrachloride	110		110		63-132	0		20
1,1,1-Trichloroethane	110		110		67-130	0		20
2-Butanone	100		100		63-138	0		20
Benzene	100		100		70-130	0		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341099
Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02,05-06 Batch: WG1808860-3 WG1808860-4								
1,2-Dichloroethane	110		110		70-130	0		20
Methyl cyclohexane	110		100		70-130	10		20
Trichloroethene	110		100		70-130	10		20
1,2-Dichloropropane	100		100		70-130	0		20
Bromodichloromethane	100		100		67-130	0		20
cis-1,3-Dichloropropene	97		97		70-130	0		20
Toluene	110		110		70-130	0		20
Tetrachloroethene	120		120		70-130	0		20
4-Methyl-2-pentanone	92		96		59-130	4		20
trans-1,3-Dichloropropene	100		110		70-130	10		20
1,1,2-Trichloroethane	110		110		70-130	0		20
Dibromochloromethane	100		100		63-130	0		20
1,2-Dibromoethane	110		110		70-130	0		20
2-Hexanone	97		97		57-130	0		20
Chlorobenzene	110		110		75-130	0		20
Ethylbenzene	110		110		70-130	0		20
p/m-Xylene	105		105		70-130	0		20
o-Xylene	105		105		70-130	0		20
Styrene	105		105		70-130	0		20
Bromoform	97		96		54-136	1		20
Isopropylbenzene	110		100		70-130	10		20
1,3-Dichlorobenzene	110		110		70-130	0		20
1,4-Dichlorobenzene	110		110		70-130	0		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341099

Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02,05-06 Batch: WG1808860-3 WG1808860-4								
1,2-Dichlorobenzene	110		110		70-130	0		20
1,2-Dibromo-3-chloropropane	97		100		41-144	3		20
1,2,4-Trichlorobenzene	110		120		70-130	9		20
1,2,3-Trichlorobenzene	120		110		70-130	9		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	89		93		70-130
Toluene-d8	98		101		70-130
4-Bromofluorobenzene	96		95		70-130
Dibromofluoromethane	92		93		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341099

Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 06 Batch: WG1808869-3 WG1808869-4								
1,4-Dioxane	110		120		70-130	9		25
1,1,2,2-Tetrachloroethane	109		102		70-130	7		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	94		94		70-130
4-Bromofluorobenzene	92		91		70-130

Matrix Spike Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341099

Report Date: 08/08/23

Parameter	*Native Sample*	*MS Added*	*MS Found*	*MS %Recovery*	*Qual*	*MSD Found*	*MSD %Recovery*	*Qual*	*Recovery Limits*	*RPD*	*Qual*	*RPD Limits*
Dissolved Gases by GC - Mansfield Lab	Associated sample(s): 02-07	QC Batch ID: WG1805450-5	QC Sample: L2341099-04	Client ID: S-429_20230718								
Carbon Dioxide	47.0	12	68.1	**176**	Q	-	-		80-120	-		25

PETROLEUM HYDROCARBONS

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-02
Client ID: S-430_20230718
Sample Location: FORMER PHL REFINERY

Date Collected: 07/18/23 08:45
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/24/23 11:07
Analyst: ALL

Extraction Method: EPA 3510C
Extraction Date: 07/23/23 16:01

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	560		ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	83		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-02 D
Client ID: S-430_20230718
Sample Location: FORMER PHL REFINERY

Date Collected: 07/18/23 08:45
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/20/23 18:17
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	9500		ug/l	500	30.	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	114		70-130
4-Bromofluorobenzene	115		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-03
Client ID: S-431_20230718
Sample Location: FORMER PHL REFINERY

Date Collected: 07/18/23 10:00
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/20/23 16:45
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	340		ug/l	50	3.0	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	109		70-130
4-Bromofluorobenzene	117		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-03
Client ID: S-431_20230718
Sample Location: FORMER PHL REFINERY

Date Collected: 07/18/23 10:00
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/24/23 11:42
Analyst: ALL

Extraction Method: EPA 3510C
Extraction Date: 07/23/23 16:01

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	196	J	ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	66		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-04
Client ID: S-429_20230718
Sample Location: FORMER PHL REFINERY

Date Collected: 07/18/23 11:20
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/24/23 12:17
Analyst: ALL

Extraction Method: EPA 3510C
Extraction Date: 07/23/23 16:01

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	591		ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	77		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-04 D
Client ID: S-429_20230718
Sample Location: FORMER PHL REFINERY

Date Collected: 07/18/23 11:20
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/20/23 18:48
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	240000		ug/l	25000	1500	500

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	111		70-130
4-Bromofluorobenzene	112		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-05
Client ID: S-414_20230718
Sample Location: FORMER PHL REFINERY

Date Collected: 07/18/23 12:20
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/24/23 13:27
Analyst: ALL

Extraction Method: EPA 3510C
Extraction Date: 07/23/23 16:01

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	2230		ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	89		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-05 D
Client ID: S-414_20230718
Sample Location: FORMER PHL REFINERY

Date Collected: 07/18/23 12:20
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/21/23 15:03
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	500000		ug/l	50000	3000	1000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	109		70-130
4-Bromofluorobenzene	105		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-06
Client ID: S-428_20230718
Sample Location: FORMER PHL REFINERY
Date Collected: 07/18/23 13:15
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Extraction Method:
Analytical Method: 1,8015D(M)
Analytical Date: 07/20/23 17:16
Analyst: BAD

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	520		ug/l	50	3.0	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	109		70-130
4-Bromofluorobenzene	114		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-06
Client ID: S-428_20230718
Sample Location: FORMER PHL REFINERY

Date Collected: 07/18/23 13:15
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/24/23 14:02
Analyst: ALL

Extraction Method: EPA 3510C
Extraction Date: 07/23/23 16:01

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	998		ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	79		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-07
Client ID: S-433_20230718
Sample Location: FORMER PHL REFINERY
Date Collected: 07/18/23 14:15
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/20/23 17:46
Analyst: BAD
Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	60		ug/l	50	3.0	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	111		70-130
4-Bromofluorobenzene	116		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-07
Client ID: S-433_20230718
Sample Location: FORMER PHL REFINERY

Date Collected: 07/18/23 14:15
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/24/23 12:52
Analyst: ALL

Extraction Method: EPA 3510C
Extraction Date: 07/23/23 16:01

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	229	J	ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	74		40-140

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341099
Report Date: 08/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 07/20/23 11:32
Analyst: BAD

Parameter	Result	Qualifier	Units	RL	MDL
Gasoline Range Organics - Westborough Lab for sample(s): 02-04,06-07 Batch: WG1805518-10					
Gasoline Range Organics	14	J	ug/l	50	3.0

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	103		70-130
4-Bromofluorobenzene	101		70-130

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341099
Report Date: 08/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 07/21/23 14:32
Analyst: BAD

Parameter	Result	Qualifier	Units	RL	MDL
Gasoline Range Organics - Westborough Lab for sample(s): 05 Batch: WG1805518-14					
Gasoline Range Organics	16	J	ug/l	50	3.0

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	100		70-130
4-Bromofluorobenzene	97		70-130

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341099
Report Date: 08/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 07/24/23 09:22
Analyst: ALL

Extraction Method: EPA 3510C
Extraction Date: 07/23/23 16:01

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 02-07 Batch: WG1806664-1					
TPH (C9-C44)	251	J	ug/l	500	86.2

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	104		40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341099

Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Gasoline Range Organics - Westborough Lab	Associated sample(s): 05		Batch: WG1805518-12 WG1805518-13					
Gasoline Range Organics	94		98		80-120	4		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,1,1-Trifluorotoluene	112		113		70-130
4-Bromofluorobenzene	108		108		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341099

Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Gasoline Range Organics - Westborough Lab	Associated sample(s): 02-04,06-07		Batch: WG1805518-8 WG1805518-9					
Gasoline Range Organics	98		97		80-120	1		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,1,1-Trifluorotoluene	109		107		70-130
4-Bromofluorobenzene	108		108		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341099

Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 02-07 Batch: WG1806664-2								
TPH (C9-C44)	82		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	75				40-140

METALS

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-02
Client ID: S-430_20230718
Sample Location: FORMER PHL REFINERY
Date Collected: 07/18/23 08:45
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	45200		ug/l	100.	35.0	1	07/19/23 21:31	08/08/23 08:57	EPA 3005A	1,6010D	DMB
Iron, Total	17600		ug/l	50.0	9.00	1	07/19/23 21:31	08/08/23 08:57	EPA 3005A	1,6010D	DMB
Magnesium, Total	14200		ug/l	100.	15.3	1	07/19/23 21:31	08/08/23 08:57	EPA 3005A	1,6010D	DMB
Potassium, Total	3980		ug/l	2500	237.	1	07/19/23 21:31	08/08/23 08:57	EPA 3005A	1,6010D	DMB
Sodium, Total	35100		ug/l	2000	120.	1	07/19/23 21:31	08/08/23 08:57	EPA 3005A	1,6010D	DMB

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-03
Client ID: S-431_20230718
Sample Location: FORMER PHL REFINERY
Date Collected: 07/18/23 10:00
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	50500		ug/l	100.	35.0	1	07/19/23 21:31	08/08/23 09:01	EPA 3005A	1,6010D	DMB
Iron, Total	9180		ug/l	50.0	9.00	1	07/19/23 21:31	08/08/23 09:01	EPA 3005A	1,6010D	DMB
Magnesium, Total	8570		ug/l	100.	15.3	1	07/19/23 21:31	08/08/23 09:01	EPA 3005A	1,6010D	DMB
Potassium, Total	3710		ug/l	2500	237.	1	07/19/23 21:31	08/08/23 09:01	EPA 3005A	1,6010D	DMB
Sodium, Total	22300		ug/l	2000	120.	1	07/19/23 21:31	08/08/23 09:01	EPA 3005A	1,6010D	DMB

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-04
Client ID: S-429_20230718
Sample Location: FORMER PHL REFINERY
Date Collected: 07/18/23 11:20
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	90600		ug/l	100.	35.0	1	07/19/23 21:31	08/08/23 09:05	EPA 3005A	1,6010D	DMB
Iron, Total	21800		ug/l	50.0	9.00	1	07/19/23 21:31	08/08/23 09:05	EPA 3005A	1,6010D	DMB
Magnesium, Total	14100		ug/l	100.	15.3	1	07/19/23 21:31	08/08/23 09:05	EPA 3005A	1,6010D	DMB
Potassium, Total	6620		ug/l	2500	237.	1	07/19/23 21:31	08/08/23 09:05	EPA 3005A	1,6010D	DMB
Sodium, Total	78600		ug/l	2000	120.	1	07/19/23 21:31	08/08/23 09:05	EPA 3005A	1,6010D	DMB

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-05
Client ID: S-414_20230718
Sample Location: FORMER PHL REFINERY
Date Collected: 07/18/23 12:20
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	66100		ug/l	100.	35.0	1	07/19/23 21:31	08/08/23 09:10	EPA 3005A	1,6010D	DMB
Iron, Total	21500		ug/l	50.0	9.00	1	07/19/23 21:31	08/08/23 09:10	EPA 3005A	1,6010D	DMB
Magnesium, Total	24600		ug/l	100.	15.3	1	07/19/23 21:31	08/08/23 09:10	EPA 3005A	1,6010D	DMB
Potassium, Total	7020		ug/l	2500	237.	1	07/19/23 21:31	08/08/23 09:10	EPA 3005A	1,6010D	DMB
Sodium, Total	69900		ug/l	2000	120.	1	07/19/23 21:31	08/08/23 09:10	EPA 3005A	1,6010D	DMB

Project Name: PESRM UDEX RELEASE
Lab Number: L2341099
Project Number: 213403039
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-06
Client ID: S-428_20230718
Sample Location: FORMER PHL REFINERY
Date Collected: 07/18/23 13:15
Date Received: 07/18/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	28500		ug/l	100.	35.0	1	07/19/23 21:31	08/08/23 09:14	EPA 3005A	1,6010D	DMB
Iron, Total	9280		ug/l	50.0	9.00	1	07/19/23 21:31	08/08/23 09:14	EPA 3005A	1,6010D	DMB
Magnesium, Total	4660		ug/l	100.	15.3	1	07/19/23 21:31	08/08/23 09:14	EPA 3005A	1,6010D	DMB
Potassium, Total	3440		ug/l	2500	237.	1	07/19/23 21:31	08/08/23 09:14	EPA 3005A	1,6010D	DMB
Sodium, Total	20500		ug/l	2000	120.	1	07/19/23 21:31	08/08/23 09:14	EPA 3005A	1,6010D	DMB

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-07 Date Collected: 07/18/23 14:15

Client ID: S-433_20230718 Date Received: 07/18/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	135000		ug/l	100.	35.0	1	07/19/23 21:31	08/08/23 10:01	EPA 3005A	1,6010D	DMB
Iron, Total	4020		ug/l	50.0	9.00	1	07/19/23 21:31	08/08/23 10:01	EPA 3005A	1,6010D	DMB
Magnesium, Total	15600		ug/l	100.	15.3	1	07/19/23 21:31	08/08/23 10:01	EPA 3005A	1,6010D	DMB
Potassium, Total	10200		ug/l	2500	237.	1	07/19/23 21:31	08/08/23 10:01	EPA 3005A	1,6010D	DMB
Sodium, Total	201000		ug/l	2000	120.	1	07/19/23 21:31	08/08/23 10:01	EPA 3005A	1,6010D	DMB

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 02-07 Batch: WG1805052-1										
Calcium, Total	ND		ug/l	100	35.0	1	07/19/23 21:31	07/25/23 13:29	1,6010D	AMW
Iron, Total	ND		ug/l	50.0	9.00	1	07/19/23 21:31	07/25/23 13:29	1,6010D	AMW
Magnesium, Total	ND		ug/l	100	15.3	1	07/19/23 21:31	07/25/23 13:29	1,6010D	AMW
Potassium, Total	ND		ug/l	2500	237.	1	07/19/23 21:31	07/25/23 13:29	1,6010D	AMW
Sodium, Total	206.	J	ug/l	2000	120.	1	07/19/23 21:31	07/25/23 13:29	1,6010D	AMW

Prep Information

Digestion Method: EPA 3005A

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341099

Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 02-07 Batch: WG1805052-2								
Calcium, Total	96		-		80-120	-		
Iron, Total	96		-		80-120	-		
Magnesium, Total	101		-		80-120	-		
Potassium, Total	100		-		80-120	-		
Sodium, Total	98		-		80-120	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341099
Report Date: 08/08/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 02-07 QC Batch ID: WG1805052-3 QC Sample: L2340816-15 Client ID: MS Sample												
Calcium, Total	65900	10000	73900	80		-	-		75-125	-		20
Iron, Total	1520	1000	2440	92		-	-		75-125	-		20
Magnesium, Total	20600	10000	30000	94		-	-		75-125	-		20
Potassium, Total	1960J	10000	12500	125		-	-		75-125	-		20
Sodium, Total	287000	10000	292000	**50**	Q	-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341099

Report Date: 08/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 02-07 QC Batch ID: WG1805052-4 QC Sample: L2340816-15 Client ID: DUP Sample						
Iron, Total	1520	1550	ug/l	2		20

INORGANICS
&
MISCELLANEOUS

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341099
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-02
Client ID: S-430_20230718
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/18/23 08:45
Date Received: 07/18/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 08:45	121,2320B	NGS
Alkalinity, Bicarbonate	176000		ug CaCO3/L	2000	NA	1	-	08/01/23 08:45	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	42700		ug/l	500	83.9	1	-	07/19/23 18:00	44,300.0	CVN
Nitrogen, Nitrate	70.8		ug/l	50.0	12.8	1	-	07/19/23 18:00	44,300.0	CVN
Sulfate	1880		ug/l	1000	454.	1	-	07/19/23 18:00	44,300.0	CVN

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341099
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-03
Client ID: S-431_20230718
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/18/23 10:00
Date Received: 07/18/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 08:45	121,2320B	NGS
Alkalinity, Bicarbonate	58600		ug CaCO3/L	2000	NA	1	-	08/01/23 08:45	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	29900		ug/l	500	83.9	1	-	07/19/23 14:10	44,300.0	CVN
Nitrogen, Nitrate	2350		ug/l	50.0	12.8	1	-	07/19/23 14:10	44,300.0	CVN
Sulfate	114000		ug/l	10000	4540	10	-	07/19/23 17:12	44,300.0	CVN

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341099
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-04
Client ID: S-429_20230718
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/18/23 11:20
Date Received: 07/18/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 08:45	121,2320B	NGS
Alkalinity, Bicarbonate	233000		ug CaCO3/L	2000	NA	1	-	08/01/23 08:45	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	162000		ug/l	5000	839.	10	-	07/19/23 17:24	44,300.0	CVN
Nitrogen, Nitrate	ND		ug/l	50.0	12.8	1	-	07/19/23 14:23	44,300.0	CVN
Sulfate	3190		ug/l	1000	454.	1	-	07/19/23 14:23	44,300.0	CVN

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341099
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-05
Client ID: S-414_20230718
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/18/23 12:20
Date Received: 07/18/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 08:45	121,2320B	NGS
Alkalinity, Bicarbonate	260000		ug CaCO3/L	2000	NA	1	-	08/01/23 08:45	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	98200		ug/l	5000	839.	10	-	07/19/23 14:47	44,300.0	CVN
Nitrogen, Nitrate	148.		ug/l	50.0	12.8	1	-	07/19/23 14:35	44,300.0	CVN
Sulfate	26200		ug/l	1000	454.	1	-	07/19/23 14:35	44,300.0	CVN

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341099
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-06
Client ID: S-428_20230718
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/18/23 13:15
Date Received: 07/18/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 08:45	121,2320B	NGS
Alkalinity, Bicarbonate	77400		ug CaCO3/L	2000	NA	1	-	08/01/23 08:45	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	34600		ug/l	500	83.9	1	-	07/19/23 15:23	44,300.0	CVN
Nitrogen, Nitrate	ND		ug/l	50.0	12.8	1	-	07/19/23 15:23	44,300.0	CVN
Sulfate	3210		ug/l	1000	454.	1	-	07/19/23 15:23	44,300.0	CVN

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341099
Report Date: 08/08/23

SAMPLE RESULTS

Lab ID: L2341099-07
Client ID: S-433_20230718
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/18/23 14:15
Date Received: 07/18/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 08:45	121,2320B	NGS
Alkalinity, Bicarbonate	466000		ug CaCO3/L	2000	NA	1	-	08/01/23 08:45	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	265000		ug/l	5000	839.	10	-	07/19/23 18:12	44,300.0	CVN
Nitrogen, Nitrate	22.8	J	ug/l	50.0	12.8	1	-	07/19/23 15:35	44,300.0	CVN
Sulfate	24400		ug/l	1000	454.	1	-	07/19/23 15:35	44,300.0	CVN

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341099

Project Number: 213403039 **Report Date:** 08/08/23

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Anions by Ion Chromatography - Westborough Lab for sample(s): 02-07 Batch: WG1805176-1										
Chloride	ND		ug/l	500	83.9	1	-	07/19/23 16:23	44,300.0	CVN
Nitrogen, Nitrate	ND		ug/l	50.0	12.8	1	-	07/19/23 16:23	44,300.0	CVN
Sulfate	ND		ug/l	1000	454.	1	-	07/19/23 16:23	44,300.0	CVN
General Chemistry - Westborough Lab for sample(s): 02-07 Batch: WG1810243-1										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 08:45	121,2320B	NGS
General Chemistry - Westborough Lab for sample(s): 02-07 Batch: WG1810245-1										
Alkalinity, Bicarbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 08:45	121,2320B	NGS

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341099

Report Date: 08/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 02-07 Batch: WG1805176-2								
Chloride	103		-		90-110	-		
Nitrogen, Nitrate	102		-		90-110	-		
Sulfate	104		-		90-110	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341099
Report Date: 08/08/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 02-07 QC Batch ID: WG1805176-3 QC Sample: L2341099-02 Client ID: S-430_20230718												
Chloride	42700	4000	45200	**61**	Q	-	-		90-110	-		18
Nitrogen, Nitrate	70.8	400	469	100		-	-		90-110	-		15
Sulfate	1880	8000	10600	109		-	-		90-110	-		20

Lab Duplicate Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341099
Report Date: 08/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 02-07 QC Batch ID: WG1805176-4 QC Sample: L2341099-02 Client ID: S-430_20230718						
Chloride	42700	42600	ug/l	0		18
Nitrogen, Nitrate	70.8	133	ug/l	**61**	Q	15
Sulfate	1880	2160	ug/l	14		20
General Chemistry - Westborough Lab Associated sample(s): 02-07 QC Batch ID: WG1810243-2 QC Sample: L2341099-02 Client ID: S-430_20230718						
Alkalinity, Carbonate	ND	ND	ug CaCO3/L	NC		10
General Chemistry - Westborough Lab Associated sample(s): 02-07 QC Batch ID: WG1810245-2 QC Sample: L2341099-02 Client ID: S-430_20230718						
Alkalinity, Bicarbonate	176000	184000	ug CaCO3/L	4		9

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341099
Report Date: 08/08/23

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent
B	Absent
C	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2341099-01A	Vial HCl preserved	B	NA		5.9	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341099-01B	Vial HCl preserved	B	NA		5.9	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341099-02A	Vial HCl preserved	A	NA		5.4	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341099-02B	Vial HCl preserved	A	NA		5.4	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341099-02C	Vial HCl preserved	A	NA		5.4	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341099-02D	Vial HCl preserved	A	NA		5.4	Y	Absent		PA-TPH-GRO(14)
L2341099-02E	Vial HCl preserved	A	NA		5.4	Y	Absent		PA-TPH-GRO(14)
L2341099-02F	Vial HCl preserved	A	NA		5.4	Y	Absent		PA-TPH-GRO(14)
L2341099-02G	20ml Vial HCl preserved	A	NA		5.4	Y	Absent		DISSGAS(14)
L2341099-02H	20ml Vial HCl preserved	A	NA		5.4	Y	Absent		DISSGAS(14)
L2341099-02I	Vial unpreserved 20ml	A	NA		5.4	Y	Absent		DISSGAS-CO2(7)
L2341099-02J	Vial unpreserved 20ml	A	NA		5.4	Y	Absent		DISSGAS-CO2(7)
L2341099-02K	Plastic 250ml unpreserved	C	7	7	3.9	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2341099-02L	Plastic 250ml HNO3 preserved	C	<2	<2	3.9	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),K-TI-PPB(180),NA-TI-PPB(180),FE-TI-PPB(180)
L2341099-02M	Plastic 250ml Zn Acetate/NaOH preserved	C	>9	>9	3.9	Y	Absent		SUB-SULFIDE()
L2341099-02N	Plastic 250ml Zn Acetate/NaOH preserved	C	>9	>9	3.9	Y	Absent		SUB-SULFIDE()
L2341099-02O	Plastic 500ml unpreserved/No Headspace	C	NA		3.9	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2341099-02P	Amber 500ml unpreserved	C	7	7	3.9	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-02Q	Amber 500ml unpreserved	C	7	7	3.9	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-02R	Amber 500ml unpreserved	C	7	7	3.9	Y	Absent		PA-TPH-DROD-C44(7)

*Values in parentheses indicate holding time in days

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341099
Report Date: 08/08/23

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2341099-02S	Amber 500ml unpreserved	C	7	7	3.9	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-02T	Amber 500ml unpreserved	A	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-02U	Amber 500ml unpreserved	A	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-03A	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341099-03B	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341099-03C	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341099-03D	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-TPH-GRO(14)
L2341099-03E	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-TPH-GRO(14)
L2341099-03F	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-TPH-GRO(14)
L2341099-03G	20ml Vial HCl preserved	C	NA		3.9	Y	Absent		DISSGAS(14)
L2341099-03H	20ml Vial HCl preserved	C	NA		3.9	Y	Absent		DISSGAS(14)
L2341099-03I	Vial unpreserved 20ml	C	NA		3.9	Y	Absent		DISSGAS-CO2(7)
L2341099-03J	Vial unpreserved 20ml	C	NA		3.9	Y	Absent		DISSGAS-CO2(7)
L2341099-03K	Plastic 250ml unpreserved	C	7	7	3.9	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2341099-03L	Plastic 250ml HNO3 preserved	B	<2	<2	5.9	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),K-TI-PPB(180),NA-TI-PPB(180),FE-TI-PPB(180)
L2341099-03M	Plastic 250ml Zn Acetate/NaOH preserved	B	>9	>9	5.9	Y	Absent		SUB-SULFIDE()
L2341099-03N	Plastic 250ml Zn Acetate/NaOH preserved	B	>9	>9	5.9	Y	Absent		SUB-SULFIDE()
L2341099-03O	Plastic 500ml unpreserved/No Headspace	A	NA		5.4	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2341099-03P	Amber 500ml unpreserved	A	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-03Q	Amber 500ml unpreserved	A	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-03R	Amber 500ml unpreserved	A	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-03S	Amber 500ml unpreserved	A	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-03T	Amber 500ml unpreserved	A	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-03U	Amber 500ml unpreserved	A	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-04A	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341099-04B	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341099-04C	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-8260-SIM(14),PA-8260(14)

*Values in parentheses indicate holding time in days

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341099
Report Date: 08/08/23

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2341099-04D	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-TPH-GRO(14)
L2341099-04E	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-TPH-GRO(14)
L2341099-04F	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-TPH-GRO(14)
L2341099-04G	20ml Vial HCl preserved	C	NA		3.9	Y	Absent		DISSGAS(14)
L2341099-04H	20ml Vial HCl preserved	C	NA		3.9	Y	Absent		DISSGAS(14)
L2341099-04I	Vial unpreserved 20ml	C	NA		3.9	Y	Absent		DISSGAS-CO2(7)
L2341099-04J	Vial unpreserved 20ml	C	NA		3.9	Y	Absent		DISSGAS-CO2(7)
L2341099-04K	Plastic 250ml unpreserved	C	7	7	3.9	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2341099-04L	Plastic 250ml HNO3 preserved	C	<2	<2	3.9	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),NA-TI-PPB(180),K-TI-PPB(180),FE-TI-PPB(180)
L2341099-04M	Plastic 250ml Zn Acetate/NaOH preserved	C	>9	>9	3.9	Y	Absent		SUB-SULFIDE()
L2341099-04N	Plastic 250ml Zn Acetate/NaOH preserved	B	>9	>9	5.9	Y	Absent		SUB-SULFIDE()
L2341099-04O	Plastic 500ml unpreserved/No Headspace	C	NA		3.9	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2341099-04P	Amber 500ml unpreserved	B	7	7	5.9	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-04Q	Amber 500ml unpreserved	B	7	7	5.9	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-04R	Amber 500ml unpreserved	B	7	7	5.9	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-04S	Amber 500ml unpreserved	B	7	7	5.9	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-04T	Amber 500ml unpreserved	B	7	7	5.9	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-04U	Amber 500ml unpreserved	B	7	7	5.9	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-05A	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341099-05B	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341099-05C	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341099-05D	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-TPH-GRO(14)
L2341099-05E	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-TPH-GRO(14)
L2341099-05F	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-TPH-GRO(14)
L2341099-05G	20ml Vial HCl preserved	C	NA		3.9	Y	Absent		DISSGAS(14)
L2341099-05H	20ml Vial HCl preserved	C	NA		3.9	Y	Absent		DISSGAS(14)
L2341099-05I	Vial unpreserved 20ml	C	NA		3.9	Y	Absent		DISSGAS-CO2(7)

*Values in parentheses indicate holding time in days

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341099
Report Date: 08/08/23

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2341099-05J	Vial unpreserved 20ml	C	NA		3.9	Y	Absent		DISSGAS-CO2(7)
L2341099-05K	Plastic 250ml unpreserved	C	7	7	3.9	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2341099-05L	Plastic 250ml HNO3 preserved	C	<2	<2	3.9	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),K-TI-PPB(180),NA-TI-PPB(180),FE-TI-PPB(180)
L2341099-05M	Plastic 250ml Zn Acetate/NaOH preserved	C	>9	>9	3.9	Y	Absent		SUB-SULFIDE()
L2341099-05N	Plastic 250ml Zn Acetate/NaOH preserved	B	>9	>9	5.9	Y	Absent		SUB-SULFIDE()
L2341099-05O	Plastic 500ml unpreserved/No Headspace	C	NA		3.9	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2341099-05P	Amber 500ml unpreserved	A	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-05Q	Amber 500ml unpreserved	A	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-05R	Amber 500ml unpreserved	A	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-05S	Amber 500ml unpreserved	A	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-05T	Amber 500ml unpreserved	A	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-05U	Amber 500ml unpreserved	A	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-06A	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341099-06B	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341099-06C	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341099-06D	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-TPH-GRO(14)
L2341099-06E	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-TPH-GRO(14)
L2341099-06F	Vial HCl preserved	C	NA		3.9	Y	Absent		PA-TPH-GRO(14)
L2341099-06G	20ml Vial HCl preserved	C	NA		3.9	Y	Absent		DISSGAS(14)
L2341099-06H	20ml Vial HCl preserved	C	NA		3.9	Y	Absent		DISSGAS(14)
L2341099-06I	Vial unpreserved 20ml	C	NA		3.9	Y	Absent		DISSGAS-CO2(7)
L2341099-06J	Vial unpreserved 20ml	C	NA		3.9	Y	Absent		DISSGAS-CO2(7)
L2341099-06K	Plastic 250ml unpreserved	B	7	7	5.9	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2341099-06L	Plastic 250ml HNO3 preserved	C	<2	<2	3.9	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),K-TI-PPB(180),NA-TI-PPB(180),FE-TI-PPB(180)
L2341099-06M	Plastic 250ml Zn Acetate/NaOH preserved	C	>9	>9	3.9	Y	Absent		SUB-SULFIDE()
L2341099-06N	Plastic 250ml Zn Acetate/NaOH preserved	B	>9	>9	5.9	Y	Absent		SUB-SULFIDE()

*Values in parentheses indicate holding time in days

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2341099-06O	Plastic 500ml unpreserved/No Headspace	C	NA		3.9	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2341099-06P	Amber 500ml unpreserved	B	7	7	5.9	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-06Q	Amber 500ml unpreserved	B	7	7	5.9	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-06R	Amber 500ml unpreserved	B	7	7	5.9	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-06S	Amber 500ml unpreserved	B	7	7	5.9	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-06T	Amber 500ml unpreserved	A	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-06U	Amber 500ml unpreserved	A	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-07A	Vial HCl preserved	A	NA		5.4	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341099-07B	Vial HCl preserved	A	NA		5.4	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341099-07C	Vial HCl preserved	A	NA		5.4	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341099-07D	Vial HCl preserved	A	NA		5.4	Y	Absent		PA-TPH-GRO(14)
L2341099-07E	Vial HCl preserved	A	NA		5.4	Y	Absent		PA-TPH-GRO(14)
L2341099-07F	Vial HCl preserved	A	NA		5.4	Y	Absent		PA-TPH-GRO(14)
L2341099-07G	20ml Vial HCl preserved	A	NA		5.4	Y	Absent		DISSGAS(14)
L2341099-07H	20ml Vial HCl preserved	A	NA		5.4	Y	Absent		DISSGAS(14)
L2341099-07I	Vial unpreserved 20ml	A	NA		5.4	Y	Absent		DISSGAS-CO2(7)
L2341099-07J	Vial unpreserved 20ml	A	NA		5.4	Y	Absent		DISSGAS-CO2(7)
L2341099-07K	Plastic 250ml unpreserved	A	7	7	5.4	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2341099-07L	Plastic 250ml HNO3 preserved	A	<2	<2	5.4	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),K-TI-PPB(180),NA-TI-PPB(180),FE-TI-PPB(180)
L2341099-07M	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	5.4	Y	Absent		SUB-SULFIDE()
L2341099-07N	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	5.4	Y	Absent		SUB-SULFIDE()
L2341099-07O	Plastic 500ml unpreserved/No Headspace	A	NA		5.4	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2341099-07P	Amber 500ml unpreserved	A	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-07Q	Amber 500ml unpreserved	A	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-07R	Amber 500ml unpreserved	A	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-07S	Amber 500ml unpreserved	B	7	7	5.9	Y	Absent		PA-TPH-DROD-C44(7)
L2341099-07T	Amber 500ml unpreserved	B	7	7	5.9	Y	Absent		PA-TPH-DROD-C44(7)

*Values in parentheses indicate holding time in days

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341099
Report Date: 08/08/23

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2341099-07U	Amber 500ml unpreserved	B	7	7	5.9	Y	Absent		PA-TPH-DROD-C44(7)

*Values in parentheses indicate holding time in days

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2341099
Project Number:	213403039	**Report Date:**	08/08/23

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: DU Report with 'J' Qualifiers

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2341099
Project Number:	213403039	**Report Date:**	08/08/23

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively

Report Format: DU Report with 'J' Qualifiers

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2341099
Project Number:	213403039	**Report Date:**	08/08/23

Data Qualifiers

Identified Compounds (TICs). For calculated parameters, this represents that one or more values used in the calculation were estimated.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

ND - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2341099
Project Number:	213403039	**Report Date:**	08/08/23

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.

44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.

117 Technical Guidance for the Natural Attenuation Indicators: Methane, Ethane, and Ethene, EPA-NE, Revision 1, February 21, 2002 and Sample Preparation & Calculations for Dissolved Gas Analysis in Water Samples using a GC Headspace Equilibration Technique, EPA RSKSOP-175, Revision 2, May 2004.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA ANALYTICAL — Where Data Matters

Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193
Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 7/19/23

ALPHA Job #: L2341099

Client Information

Client: PESRM c/o Stantec
Address: 1060 Andrew Drive, Suite 140
West Chester, PA 19380
Phone: 610-840-2500
Fax: 610-840-2501
Email: andrew.klingbeil@stantec.com

☐ These samples have been Previously analyzed by Alpha

Project Information

Project Name: PESRM UDEX Release
Project Location: Former PHL Refinery
Project #: 213403039
Project Manager: Andrew Klingbeil
ALPHA Quote #: 21953

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)

Due Date: Time:

Report Information — Data Deliverables

☐ FAX ☒ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program: PA One Cleanup
Criteria:

Other Project Specific Requirements/Comments/Detection Limits:
See quote 21953 and July 14, 2023 email from Andrew K for details on analyses

ANALYSIS

SAMPLE HANDLING
Filtration
☐ Done ☒ Not Needed ☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	PA Volatile Organics 8260C	TPH - GRO, Extended Ranges 8015D	Alkalinity (Carb and Bicarb) 2320B	Chloride,Sulfate,Nitrate 300	Dissolved gases (incl CO2)	Total Ca, Fe, Mg, K, Na 6010D	Sulfide SM 4500						Sample Specific Comments
L1099-01	Trip Blank	--	--	TB	--	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
-02	S-430_20230718	7/18/23	8:45	GW	BO	☒	☒	☒	☒	☒	☒	☒	☐	☐	☐	☐	☐	
-03	S-431_20230718	7/18/23	10:00	GW	BO	☒	☒	☒	☒	☒	☒	☒	☐	☐	☐	☐	☐	
-04	S-429_20230718	7/18/23	11:20	GW	BO	☒	☒	☒	☒	☒	☒	☒	☐	☐	☐	☐	☐	
-05	S-414_20230718	7/18/23	12:20	GW	BO	☒	☒	☒	☒	☒	☒	☒	☐	☐	☐	☐	☐	
-06	S-428_20230718	7/18/23	13:15	GW	BO	☒	☒	☒	☒	☒	☒	☒	☐	☐	☐	☐	☐	
-07	S-433_20230718	7/18/23	14:15	GW	BO	☒	☒	☒	☒	☒	☒	☒	☐	☐	☐	☐	☐	
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
	Container Type					-	-	-	-	-	-	-	-	-	-	-	-	
	Preservative					-	-	-	-	-	-	-	-	-	-	-	-	

Relinquished By:	Date/Time	Received By:	Date/Time
	7/19/23 15:15		7/18/23 15:30
	7/18/23 15:30		7/18/23 15:45
	7/18/23 18:30		7/18/23 22:20
	7/18/23		

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

FORM NO: 01-01(I-NJ) (rev. 5-JAN-12)

SGS

Dayton, NJ

07/24/23

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report



Technical Report for

Alpha Analytical Laboratories, Inc.

Alpha Analytical, PA

L2341099

SGS Job Number: JD69623

Sampling Date: 07/18/23

Report to:

Alpha Analytical Laboratories, Inc.
Eight Walkup Drive
Westborough, MA 01581
subreports@alphalab.com; mvitanza@alphalab.com

ATTN: Marty Vitanza

Total number of pages in report: **18**

NELAP ACCREDITED TNI LABORATORY

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable unless noted in the narrative, comments or footnotes.

David Chastain
General Manager

Client Service contact: Michelle Jenkins 732-329-0200
Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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EHS.US.CustomerCare@sgs.com

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SGS North America Inc.

Sample Summary

Alpha Analytical Laboratories, Inc.

Job No: JD69623

Alpha Analytical, PA
Project No: L2341099

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JD69623-1	07/18/23	08:45		07/20/23	AQ	Water	S-430_20230718
JD69623-2	07/18/23	10:00		07/20/23	AQ	Water	S-431_20230718
JD69623-3	07/18/23	11:20		07/20/23	AQ	Water	S-429_20230718
JD69623-4	07/18/23	12:20		07/20/23	AQ	Water	S-414_20230718
JD69623-5	07/18/23	13:15		07/20/23	AQ	Water	S-428_20230718
JD69623-6	07/18/23	14:15		07/20/23	AQ	Water	S-433_20230718

Summary of Hits

Job Number: JD69623
Account: Alpha Analytical Laboratories, Inc.
Project: Alpha Analytical, PA
Collected: 07/18/23

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method

JD69623-1 **S-430_20230718**

No hits reported in this sample.

JD69623-2 **S-431_20230718**

No hits reported in this sample.

JD69623-3 **S-429_20230718**

No hits reported in this sample.

JD69623-4 **S-414_20230718**

No hits reported in this sample.

JD69623-5 **S-428_20230718**

No hits reported in this sample.

JD69623-6 **S-433_20230718**

No hits reported in this sample.

Sample Results

Report of Analysis

SGS North America Inc.

Report of Analysis

Client Sample ID:	S-430_20230718		
Lab Sample ID:	JD69623-1	**Date Sampled:**	07/18/23
Matrix:	AQ - Water	**Date Received:**	07/20/23
		Percent Solids:	n/a
Project:	Alpha Analytical, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfide	< 2.0	2.0	mg/l	1	07/23/23 15:30	MK	SM4500S2- F-11

RL = Reporting Limit

SGS North America Inc.

Report of Analysis

Client Sample ID:	S-431_20230718		
Lab Sample ID:	JD69623-2	**Date Sampled:**	07/18/23
Matrix:	AQ - Water	**Date Received:**	07/20/23
		Percent Solids:	n/a
Project:	Alpha Analytical, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfide	< 2.0	2.0	mg/l	1	07/23/23 15:30	MK	SM4500S2- F-11

RL = Reporting Limit

SGS North America Inc.

Report of Analysis

Client Sample ID:	S-429_20230718		
Lab Sample ID:	JD69623-3	**Date Sampled:**	07/18/23
Matrix:	AQ - Water	**Date Received:**	07/20/23
		Percent Solids:	n/a
Project:	Alpha Analytical, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfide	< 2.0	2.0	mg/l	1	07/23/23 15:30	MK	SM4500S2- F-11

RL = Reporting Limit

SGS North America Inc.

Report of Analysis

Client Sample ID:	S-414_20230718		
Lab Sample ID:	JD69623-4	**Date Sampled:**	07/18/23
Matrix:	AQ - Water	**Date Received:**	07/20/23
		Percent Solids:	n/a
Project:	Alpha Analytical, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfide	< 2.0	2.0	mg/l	1	07/23/23 15:30	MK	SM4500S2- F-11

RL = Reporting Limit

SGS North America Inc.

Report of Analysis

Client Sample ID:	S-428_20230718		
Lab Sample ID:	JD69623-5	**Date Sampled:**	07/18/23
Matrix:	AQ - Water	**Date Received:**	07/20/23
		Percent Solids:	n/a
Project:	Alpha Analytical, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfide	< 2.0	2.0	mg/l	1	07/23/23 15:30	MK	SM4500S2- F-11

RL = Reporting Limit

SGS North America Inc.

Report of Analysis

Client Sample ID:	S-433_20230718		
Lab Sample ID:	JD69623-6	**Date Sampled:**	07/18/23
Matrix:	AQ - Water	**Date Received:**	07/20/23
		Percent Solids:	n/a
Project:	Alpha Analytical, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfide	< 2.0	2.0	mg/l	1	07/23/23 15:30	MK	SM4500S2- F-11

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

WW

ALPHA ANALYTICAL

Subcontract Chain of Custody

SGS- North America
2235 US-130
Dayton, NJ 08810

Alpha Job Number
L2341099

JD69623

Client Information	Project Information	Regulatory Requirements/Report Limits
Client: Alpha Analytical Labs Address: Eight Walkup Drive Westborough, MA 01581-1019 Phone: 508.439.5155 Email: mvitanza@alphalab.com	Project Location: PA Project Manager: Marty Vitanza **Turnaround & Deliverables Information** Due Date: Deliverables:	State/Federal Program: Regulatory Criteria:

Project Specific Requirements and/or Report Requirements

Reference following Alpha Job Number on final report/deliverables: L2341099

Report to include Method Blank, LCS/LCSD:

Additional Comments: Send all results/reports to subreports@alphalab.com

Lab ID	Client ID	Collection Date/Time	Sample Matrix	Analysis	Batch QC
1	S-430_20230718	07-18-23 08:45	WATER	Sulfide	C21
2	S-431_20230718	07-18-23 10:00	WATER	Sulfide	
3	S-429_20230718	07-18-23 11:20	WATER	Sulfide	
4	S-414_20230718	07-18-23 12:20	WATER	Sulfide	
5	S-428_20230718	07-18-23 13:15	WATER	Sulfide	
6	S-433_20230718	07-18-23 14:15	WATER	Sulfide	

Initial Assessment	Relinquished By:	Date/Time:	Received By:	Date/Time:
Label Verification		7/19/23	DAC	7/19/23 17:30
	DAC	7/19/23 22:30		7/19/23 22:35
		7/19/23		7/20/23 7:00
Form No: AL_subcoc	7.20.23	650	Edward Carpenter	7/20/23 9:54am

SGS Sample Receipt Summary

Job Number: JD69623 **Client:** ALPHA **Project:** L2341099

Date / Time Received: 7/20/2023 9:54:00 AM **Delivery Method:** **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (1.0);

Cooler Temps (Corrected) °C: Cooler 1: (0.7);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	IR Gun 40		
3. Cooler media:	Ice (Bag)		
4. No. Coolers:	1		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☐	☑
2. Trip Blank listed on COC:	☐		☐	☑
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Test Strip Lot #s: pH 1-12: 231619 pH 12+: 203117A Other: (Specify)

Comments

SM089-03
Rev. Date 12/7/17

JD69623: Chain of Custody
Page 2 of 2

5

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: JD69623
Account: ALPHAMAW - Alpha Analytical Laboratories, Inc.
Project: Alpha Analytical, PA

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Sulfide	GN43969	2.0	0.0	mg/l	10.4	10.4	100.0	80-120%
Sulfide	GN43969			mg/l	5.2	5.2	100.0	80-120%

Associated Samples:
Batch GN43969: JD69623-1, JD69623-2, JD69623-3, JD69623-4, JD69623-5, JD69623-6
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: JD69623
Account: ALPHAMAW - Alpha Analytical Laboratories, Inc.
Project: Alpha Analytical, PA

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Sulfide	GN43969	JD69542-1	mg/l	0.14	0.0	0.0	0-12%

Associated Samples:
Batch GN43969: JD69623-1, JD69623-2, JD69623-3, JD69623-4, JD69623-5, JD69623-6
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: JD69623
Account: ALPHAMAW - Alpha Analytical Laboratories, Inc.
Project: Alpha Analytical, PA

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Sulfide	GN43969	JD69542-1	mg/l	0.14	3.8	3.6	94.7	37-135%

Associated Samples:
Batch GN43969: JD69623-1, JD69623-2, JD69623-3, JD69623-4, JD69623-5, JD69623-6
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

ANALYTICAL REPORT

Lab Number:	L2341411
Client:	Stantec, Inc. 1060 Andrew Drive Suite 140 West Chester, PA 19380
ATTN:	Andrew Klingbeil
Phone:	(610) 840-2525
Project Name:	PESRM UDEX RELEASE
Project Number:	213403039
Report Date:	08/09/23

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341411
Report Date: 08/09/23

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2341411-01	TRIP BLANK	WATER	FORMER PHL REFINERY	07/19/23 00:00	07/19/23
L2341411-02	S-484_20230719	WATER	FORMER PHL REFINERY	07/19/23 08:40	07/19/23
L2341411-03	S-435_20230719	WATER	FORMER PHL REFINERY	07/19/23 09:55	07/19/23
L2341411-04	BF-106_20230719	WATER	FORMER PHIL REFINERY	07/19/23 13:10	07/19/23
L2341411-05	BF-99_20230719	WATER	FORMER PHIL REFINERY	07/19/23 12:25	07/19/23
L2341411-06	S-434_20230719	WATER	FORMER PHIL REFINERY	07/19/23 11:05	07/19/23

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2341411
Project Number:	213403039	**Report Date:**	08/09/23

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2341411
Project Number:	213403039	**Report Date:**	08/09/23

Case Narrative (continued)

Report Submission

August 09, 2023: This final report includes the results of all requested analyses.

August 04, 2023: This is a preliminary report.

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

The analysis of Sulfide was subcontracted. A copy of the laboratory report is included as an addendum. Please note: This data is only available in PDF format and is not available on Data Merger.

Sample Receipt

All samples were received via Alpha Courier in coolers with ice; however, the ice was melted in one cooler and those samples were above the required temperature range. Per client authorization of the exceedance, all requested analyses were performed.

L2341411-03: Headspace was noted in the sample containers submitted for Carbonate Alkalinity - SM 2320 (ug/l) and Bicarbonate Alkalinity - SM 2320 (ug/l).

L2341411-06: The Client ID was changed at the client's request.

Volatile Organics

L2341411-05: The acetone result should be considered estimated due to co-elution with a non-target compound.

Volatile Organics by SIM

L2341411-02D and -04D: The sample has elevated detection limits due to the dilution required by the elevated concentrations of non-target compounds in the sample.

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2341411
Project Number:	213403039	**Report Date:**	08/09/23

Case Narrative (continued)

Carbon Dioxide

L2341411-02D and -03D: The sample has an elevated detection limit for carbon dioxide due to the dilution required by the elevated concentration of target compound in the sample.

Dissolved Gases

The WG1810789-5 MS recovery, performed on L2341411-03, is outside the acceptance criteria for methane (126%); however, the associated LCS recovery is within overall method allowances. No further action was required.

Total Metals

The WG1807431-3 MS recovery, performed on L2341411-02, is outside the acceptance criteria for potassium (129%). A post digestion spike was performed and was within acceptance criteria.

The WG1807431-3 MS recovery for sodium (138%), performed on L2341411-02, does not apply because the sample concentration is greater than four times the spike amount added.

Anions by Ion Chromatography

WG1805667: A Matrix Spike and Laboratory Duplicate were prepared with the sample batch, however, the native sample was not available for reporting; therefore, the results could not be reported.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Kelly Stenstrom

Title: Technical Director/Representative Date: 08/09/23

ORGANICS

VOLATILES

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-01 Date Collected: 07/19/23 00:00
Client ID: TRIP BLANK Date Received: 07/19/23
Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/27/23 06:14
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	5.0	0.24	1
Chloromethane	ND		ug/l	2.5	0.20	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Bromomethane	ND		ug/l	1.0	0.26	1
Chloroethane	ND		ug/l	1.0	0.13	1
Trichlorofluoromethane	ND		ug/l	2.5	0.16	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
Carbon disulfide	ND		ug/l	5.0	0.30	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15	1
Methylene chloride	ND		ug/l	2.5	0.68	1
Acetone	ND		ug/l	5.0	1.5	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16	1
Methyl Acetate	ND		ug/l	2.0	0.23	1
Methyl tert butyl ether	ND		ug/l	1.0	0.17	1
1,1-Dichloroethane	ND		ug/l	0.75	0.21	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16	1
Cyclohexane	ND		ug/l	10	0.27	1
Bromochloromethane	ND		ug/l	2.5	0.15	1
Chloroform	ND		ug/l	0.75	0.22	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16	1
2-Butanone	ND		ug/l	5.0	1.9	1
Benzene	ND		ug/l	0.50	0.16	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
Methyl cyclohexane	ND		ug/l	10	0.40	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-01 Date Collected: 07/19/23 00:00

Client ID: TRIP BLANK Date Received: 07/19/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	0.50	0.19	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
Toluene	ND		ug/l	0.75	0.20	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,2-Dibromoethane	ND		ug/l	2.0	0.19	1
2-Hexanone	ND		ug/l	5.0	0.52	1
Chlorobenzene	ND		ug/l	0.50	0.18	1
Ethylbenzene	ND		ug/l	0.50	0.17	1
p/m-Xylene	ND		ug/l	1.0	0.33	1
o-Xylene	ND		ug/l	1.0	0.39	1
Xylenes, Total	ND		ug/l	1.0	0.33	1
Styrene	ND		ug/l	1.0	0.36	1
Bromoform	ND		ug/l	2.0	0.25	1
Isopropylbenzene	ND		ug/l	0.50	0.19	1
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	96		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	91		70-130
Dibromofluoromethane	99		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-01 Date Collected: 07/19/23 00:00

Client ID: TRIP BLANK Date Received: 07/19/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Matrix: Water

Analytical Method: 1,8260D-SIM(M)

Analytical Date: 07/27/23 06:14

Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	1.1	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	93		70-130
4-Bromofluorobenzene	91		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-02
Client ID: S-484_20230719
Sample Location: FORMER PHL REFINERY
Date Collected: 07/19/23 08:40
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/26/23 18:10
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	4470		ug/l	2.00	2.00	1	A
Ethene	ND		ug/l	0.500	0.500	1	A
Ethane	ND		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-02 D2
Client ID: S-484_20230719
Sample Location: FORMER PHL REFINERY

Date Collected: 07/19/23 08:40
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/28/23 09:48
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Benzene	780000		ug/l	2500	800	5000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	94		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	94		70-130
Dibromofluoromethane	96		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-02 D
Client ID: S-484_20230719
Sample Location: FORMER PHL REFINERY

Date Collected: 07/19/23 08:40
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/27/23 11:17
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	10000	490	2000
Chloromethane	ND		ug/l	5000	400	2000
Vinyl chloride	ND		ug/l	2000	140	2000
Bromomethane	ND		ug/l	2000	510	2000
Chloroethane	ND		ug/l	2000	270	2000
Trichlorofluoromethane	ND		ug/l	5000	320	2000
1,1-Dichloroethene	ND		ug/l	1000	340	2000
Carbon disulfide	ND		ug/l	10000	600	2000
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	5000	300	2000
Methylene chloride	ND		ug/l	5000	1400	2000
Acetone	ND		ug/l	10000	2900	2000
trans-1,2-Dichloroethene	ND		ug/l	1500	330	2000
Methyl Acetate	ND		ug/l	4000	470	2000
Methyl tert butyl ether	ND		ug/l	2000	330	2000
1,1-Dichloroethane	ND		ug/l	1500	420	2000
cis-1,2-Dichloroethene	ND		ug/l	1000	370	2000
1,2-Dichloroethene, Total	ND		ug/l	1000	330	2000
Cyclohexane	580	J	ug/l	20000	540	2000
Bromochloromethane	ND		ug/l	5000	300	2000
Chloroform	ND		ug/l	1500	440	2000
Carbon tetrachloride	ND		ug/l	1000	270	2000
1,1,1-Trichloroethane	ND		ug/l	1000	320	2000
2-Butanone	ND		ug/l	10000	3900	2000
Benzene	750000	E	ug/l	1000	320	2000
1,2-Dichloroethane	ND		ug/l	1000	260	2000
Methyl cyclohexane	ND		ug/l	20000	790	2000
Trichloroethene	ND		ug/l	1000	350	2000
1,2-Dichloropropane	ND		ug/l	2000	270	2000

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-02 D Date Collected: 07/19/23 08:40

Client ID: S-484_20230719 Date Received: 07/19/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	1000	380	2000
cis-1,3-Dichloropropene	ND		ug/l	1000	290	2000
Toluene	18000		ug/l	1500	410	2000
Tetrachloroethene	ND		ug/l	1000	360	2000
4-Methyl-2-pentanone	ND		ug/l	10000	830	2000
trans-1,3-Dichloropropene	ND		ug/l	1000	330	2000
1,3-Dichloropropene, Total	ND		ug/l	1000	290	2000
1,1,2-Trichloroethane	ND		ug/l	1500	290	2000
Dibromochloromethane	ND		ug/l	1000	300	2000
1,2-Dibromoethane	ND		ug/l	4000	390	2000
2-Hexanone	ND		ug/l	10000	1000	2000
Chlorobenzene	ND		ug/l	1000	360	2000
Ethylbenzene	ND		ug/l	1000	330	2000
p/m-Xylene	ND		ug/l	2000	660	2000
o-Xylene	ND		ug/l	2000	780	2000
Xylenes, Total	ND		ug/l	2000	660	2000
Styrene	ND		ug/l	2000	720	2000
Bromoform	ND		ug/l	4000	500	2000
Isopropylbenzene	ND		ug/l	1000	370	2000
1,3-Dichlorobenzene	ND		ug/l	5000	370	2000
1,4-Dichlorobenzene	ND		ug/l	5000	370	2000
1,2-Dichlorobenzene	ND		ug/l	5000	370	2000
1,2-Dibromo-3-chloropropane	ND		ug/l	5000	710	2000
1,2,4-Trichlorobenzene	ND		ug/l	5000	440	2000
1,2,3-Trichlorobenzene	ND		ug/l	5000	470	2000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	88		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	92		70-130
Dibromofluoromethane	90		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-02 D
Client ID: S-484_20230719
Sample Location: FORMER PHL REFINERY

Date Collected: 07/19/23 08:40
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/27/23 11:17
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	6000	2100	2000
1,1,2,2-Tetrachloroethane	ND		ug/l	100	11.4	2000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	86		70-130
4-Bromofluorobenzene	89		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-02 D
Client ID: S-484_20230719
Sample Location: FORMER PHL REFINERY

Date Collected: 07/19/23 08:40
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/24/23 10:04
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	45.2		mg/l	6.00	6.00	2

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-03
Client ID: S-435_20230719
Sample Location: FORMER PHL REFINERY
Date Collected: 07/19/23 09:55
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/28/23 10:09
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	5.0	0.24	1
Chloromethane	ND		ug/l	2.5	0.20	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Bromomethane	ND		ug/l	1.0	0.26	1
Chloroethane	ND		ug/l	1.0	0.13	1
Trichlorofluoromethane	ND		ug/l	2.5	0.16	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
Carbon disulfide	ND		ug/l	5.0	0.30	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15	1
Methylene chloride	ND		ug/l	2.5	0.68	1
Acetone	ND		ug/l	5.0	1.5	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16	1
Methyl Acetate	ND		ug/l	2.0	0.23	1
Methyl tert butyl ether	ND		ug/l	1.0	0.17	1
1,1-Dichloroethane	ND		ug/l	0.75	0.21	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16	1
Cyclohexane	ND		ug/l	10	0.27	1
Bromochloromethane	ND		ug/l	2.5	0.15	1
Chloroform	ND		ug/l	0.75	0.22	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16	1
2-Butanone	ND		ug/l	5.0	1.9	1
Benzene	55		ug/l	0.50	0.16	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
Methyl cyclohexane	ND		ug/l	10	0.40	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-03 Date Collected: 07/19/23 09:55

Client ID: S-435_20230719 Date Received: 07/19/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	0.50	0.19	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
Toluene	2.3		ug/l	0.75	0.20	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,2-Dibromoethane	ND		ug/l	2.0	0.19	1
2-Hexanone	ND		ug/l	5.0	0.52	1
Chlorobenzene	ND		ug/l	0.50	0.18	1
Ethylbenzene	ND		ug/l	0.50	0.17	1
p/m-Xylene	ND		ug/l	1.0	0.33	1
o-Xylene	ND		ug/l	1.0	0.39	1
Xylenes, Total	ND		ug/l	1.0	0.33	1
Styrene	ND		ug/l	1.0	0.36	1
Bromoform	ND		ug/l	2.0	0.25	1
Isopropylbenzene	ND		ug/l	0.50	0.19	1
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	94		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	94		70-130
Dibromofluoromethane	96		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-03 Date Collected: 07/19/23 09:55

Client ID: S-435_20230719 Date Received: 07/19/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Matrix: Water

Analytical Method: 1,8260D-SIM(M)

Analytical Date: 07/28/23 10:09

Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	1.1	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	94		70-130
4-Bromofluorobenzene	91		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-03
Client ID: S-435_20230719
Sample Location: FORMER PHL REFINERY

Date Collected: 07/19/23 09:55
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 08/02/23 09:14
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	ND		ug/l	2.00	2.00	1	A
Ethene	ND		ug/l	0.500	0.500	1	A
Ethane	ND		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-03 D
Client ID: S-435_20230719
Sample Location: FORMER PHL REFINERY

Date Collected: 07/19/23 09:55
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/24/23 10:22
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	109		mg/l	6.00	6.00	2

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-04 D
Client ID: BF-106_20230719
Sample Location: FORMER PHIL REFINERY

Date Collected: 07/19/23 13:10
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/28/23 12:15
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	20	0.98	4
Chloromethane	ND		ug/l	10	0.80	4
Vinyl chloride	ND		ug/l	4.0	0.28	4
Bromomethane	ND		ug/l	4.0	1.0	4
Chloroethane	ND		ug/l	4.0	0.54	4
Trichlorofluoromethane	ND		ug/l	10	0.64	4
1,1-Dichloroethene	ND		ug/l	2.0	0.68	4
Carbon disulfide	ND		ug/l	20	1.2	4
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	10	0.59	4
Methylene chloride	ND		ug/l	10	2.7	4
Acetone	ND		ug/l	20	5.8	4
trans-1,2-Dichloroethene	ND		ug/l	3.0	0.65	4
Methyl Acetate	ND		ug/l	8.0	0.94	4
Methyl tert butyl ether	ND		ug/l	4.0	0.66	4
1,1-Dichloroethane	ND		ug/l	3.0	0.84	4
cis-1,2-Dichloroethene	ND		ug/l	2.0	0.75	4
1,2-Dichloroethene, Total	ND		ug/l	2.0	0.65	4
Cyclohexane	210		ug/l	40	1.1	4
Bromochloromethane	ND		ug/l	10	0.61	4
Chloroform	ND		ug/l	3.0	0.89	4
Carbon tetrachloride	ND		ug/l	2.0	0.54	4
1,1,1-Trichloroethane	ND		ug/l	2.0	0.63	4
2-Butanone	ND		ug/l	20	7.8	4
Benzene	21		ug/l	2.0	0.64	4
1,2-Dichloroethane	ND		ug/l	2.0	0.53	4
Methyl cyclohexane	440		ug/l	40	1.6	4
Trichloroethene	ND		ug/l	2.0	0.70	4
1,2-Dichloropropane	ND		ug/l	4.0	0.55	4

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-04 D Date Collected: 07/19/23 13:10

Client ID: BF-106_20230719 Date Received: 07/19/23

Sample Location: FORMER PHIL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	2.0	0.77	4
cis-1,3-Dichloropropene	ND		ug/l	2.0	0.58	4
Toluene	1.5	J	ug/l	3.0	0.81	4
Tetrachloroethene	ND		ug/l	2.0	0.72	4
4-Methyl-2-pentanone	ND		ug/l	20	1.7	4
trans-1,3-Dichloropropene	ND		ug/l	2.0	0.66	4
1,3-Dichloropropene, Total	ND		ug/l	2.0	0.58	4
1,1,2-Trichloroethane	ND		ug/l	3.0	0.58	4
Dibromochloromethane	ND		ug/l	2.0	0.60	4
1,2-Dibromoethane	ND		ug/l	8.0	0.77	4
2-Hexanone	ND		ug/l	20	2.1	4
Chlorobenzene	ND		ug/l	2.0	0.71	4
Ethylbenzene	1.5	J	ug/l	2.0	0.67	4
p/m-Xylene	ND		ug/l	4.0	1.3	4
o-Xylene	ND		ug/l	4.0	1.6	4
Xylenes, Total	ND		ug/l	4.0	1.3	4
Styrene	ND		ug/l	4.0	1.4	4
Bromoform	ND		ug/l	8.0	0.99	4
Isopropylbenzene	53		ug/l	2.0	0.75	4
1,3-Dichlorobenzene	ND		ug/l	10	0.74	4
1,4-Dichlorobenzene	ND		ug/l	10	0.75	4
1,2-Dichlorobenzene	ND		ug/l	10	0.74	4
1,2-Dibromo-3-chloropropane	ND		ug/l	10	1.4	4
1,2,4-Trichlorobenzene	ND		ug/l	10	0.88	4
1,2,3-Trichlorobenzene	ND		ug/l	10	0.94	4

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	85		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	97		70-130
Dibromofluoromethane	87		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-04 D
Client ID: BF-106_20230719
Sample Location: FORMER PHIL REFINERY

Date Collected: 07/19/23 13:10
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/28/23 12:15
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	12	4.3	4
1,1,2,2-Tetrachloroethane	ND		ug/l	0.200	0.023	4

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	86		70-130
4-Bromofluorobenzene	95		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-05
Client ID: BF-99_20230719
Sample Location: FORMER PHIL REFINERY
Date Collected: 07/19/23 12:25
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/28/23 10:51
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	5.0	0.24	1
Chloromethane	ND		ug/l	2.5	0.20	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Bromomethane	ND		ug/l	1.0	0.26	1
Chloroethane	ND		ug/l	1.0	0.13	1
Trichlorofluoromethane	ND		ug/l	2.5	0.16	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
Carbon disulfide	ND		ug/l	5.0	0.30	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15	1
Methylene chloride	ND		ug/l	2.5	0.68	1
Acetone	23		ug/l	5.0	1.5	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16	1
Methyl Acetate	ND		ug/l	2.0	0.23	1
Methyl tert butyl ether	ND		ug/l	1.0	0.17	1
1,1-Dichloroethane	ND		ug/l	0.75	0.21	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16	1
Cyclohexane	6.6	J	ug/l	10	0.27	1
Bromochloromethane	ND		ug/l	2.5	0.15	1
Chloroform	ND		ug/l	0.75	0.22	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16	1
2-Butanone	ND		ug/l	5.0	1.9	1
Benzene	17		ug/l	0.50	0.16	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
Methyl cyclohexane	69		ug/l	10	0.40	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-05 Date Collected: 07/19/23 12:25

Client ID: BF-99_20230719 Date Received: 07/19/23

Sample Location: FORMER PHIL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	0.50	0.19	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
Toluene	1.1		ug/l	0.75	0.20	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,2-Dibromoethane	ND		ug/l	2.0	0.19	1
2-Hexanone	ND		ug/l	5.0	0.52	1
Chlorobenzene	ND		ug/l	0.50	0.18	1
Ethylbenzene	ND		ug/l	0.50	0.17	1
p/m-Xylene	ND		ug/l	1.0	0.33	1
o-Xylene	ND		ug/l	1.0	0.39	1
Xylenes, Total	ND		ug/l	1.0	0.33	1
Styrene	ND		ug/l	1.0	0.36	1
Bromoform	ND		ug/l	2.0	0.25	1
Isopropylbenzene	9.4		ug/l	0.50	0.19	1
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	91		70-130
Toluene-d8	103		70-130
4-Bromofluorobenzene	99		70-130
Dibromofluoromethane	92		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-05
Client ID: BF-99_20230719
Sample Location: FORMER PHIL REFINERY
Date Collected: 07/19/23 12:25
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/28/23 10:51
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	1.1	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	88		70-130
4-Bromofluorobenzene	96		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-06 Date Collected: 07/19/23 11:05
Client ID: S-434_20230719 Date Received: 07/19/23
Sample Location: FORMER PHIL REFINERY Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/28/23 11:33
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	5.0	0.24	1
Chloromethane	ND		ug/l	2.5	0.20	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Bromomethane	ND		ug/l	1.0	0.26	1
Chloroethane	ND		ug/l	1.0	0.13	1
Trichlorofluoromethane	ND		ug/l	2.5	0.16	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
Carbon disulfide	ND		ug/l	5.0	0.30	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15	1
Methylene chloride	ND		ug/l	2.5	0.68	1
Acetone	ND		ug/l	5.0	1.5	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16	1
Methyl Acetate	ND		ug/l	2.0	0.23	1
Methyl tert butyl ether	ND		ug/l	1.0	0.17	1
1,1-Dichloroethane	ND		ug/l	0.75	0.21	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16	1
Cyclohexane	ND		ug/l	10	0.27	1
Bromochloromethane	ND		ug/l	2.5	0.15	1
Chloroform	ND		ug/l	0.75	0.22	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16	1
2-Butanone	ND		ug/l	5.0	1.9	1
Benzene	19		ug/l	0.50	0.16	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
Methyl cyclohexane	ND		ug/l	10	0.40	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-06 Date Collected: 07/19/23 11:05

Client ID: S-434_20230719 Date Received: 07/19/23

Sample Location: FORMER PHIL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	0.50	0.19	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
Toluene	0.87		ug/l	0.75	0.20	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,2-Dibromoethane	ND		ug/l	2.0	0.19	1
2-Hexanone	ND		ug/l	5.0	0.52	1
Chlorobenzene	ND		ug/l	0.50	0.18	1
Ethylbenzene	ND		ug/l	0.50	0.17	1
p/m-Xylene	ND		ug/l	1.0	0.33	1
o-Xylene	ND		ug/l	1.0	0.39	1
Xylenes, Total	ND		ug/l	1.0	0.33	1
Styrene	ND		ug/l	1.0	0.36	1
Bromoform	ND		ug/l	2.0	0.25	1
Isopropylbenzene	ND		ug/l	0.50	0.19	1
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	95		70-130
Toluene-d8	95		70-130
4-Bromofluorobenzene	95		70-130
Dibromofluoromethane	96		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-06
Client ID: S-434_20230719
Sample Location: FORMER PHIL REFINERY
Date Collected: 07/19/23 11:05
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/28/23 11:33
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	1.1	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	93		70-130
4-Bromofluorobenzene	90		70-130

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341411
Report Date: 08/09/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 117,-
Analytical Date: 07/24/23 08:49
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL
Dissolved Gases by GC - Mansfield Lab for sample(s): 02-03 Batch: WG1806862-3					
Carbon Dioxide	ND		mg/l	3.00	3.00

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 117,-
Analytical Date: 07/26/23 08:45
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	
Dissolved Gases by GC - Mansfield Lab for sample(s): 02 Batch: WG1807835-3						
Methane	ND		ug/l	2.00	2.00	A
Ethene	ND		ug/l	0.500	0.500	A
Ethane	ND		ug/l	0.500	0.500	A

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/27/23 05:47
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1808860-5					
Dichlorodifluoromethane	ND		ug/l	5.0	0.24
Chloromethane	ND		ug/l	2.5	0.20
Vinyl chloride	ND		ug/l	1.0	0.07
Bromomethane	ND		ug/l	1.0	0.26
Chloroethane	ND		ug/l	1.0	0.13
Trichlorofluoromethane	ND		ug/l	2.5	0.16
1,1-Dichloroethene	ND		ug/l	0.50	0.17
Carbon disulfide	ND		ug/l	5.0	0.30
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15
Methylene chloride	ND		ug/l	2.5	0.68
Acetone	ND		ug/l	5.0	1.5
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16
Methyl Acetate	ND		ug/l	2.0	0.23
Methyl tert butyl ether	ND		ug/l	1.0	0.17
1,1-Dichloroethane	ND		ug/l	0.75	0.21
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16
Cyclohexane	ND		ug/l	10	0.27
Bromochloromethane	ND		ug/l	2.5	0.15
Chloroform	ND		ug/l	0.75	0.22
Carbon tetrachloride	ND		ug/l	0.50	0.13
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16
2-Butanone	ND		ug/l	5.0	1.9
Benzene	ND		ug/l	0.50	0.16
1,2-Dichloroethane	ND		ug/l	0.50	0.13
Methyl cyclohexane	ND		ug/l	10	0.40
Trichloroethene	ND		ug/l	0.50	0.18
1,2-Dichloropropane	ND		ug/l	1.0	0.14
Bromodichloromethane	ND		ug/l	0.50	0.19

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/27/23 05:47
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1808860-5					
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14
Toluene	ND		ug/l	0.75	0.20
Tetrachloroethene	ND		ug/l	0.50	0.18
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14
Dibromochloromethane	ND		ug/l	0.50	0.15
1,2-Dibromoethane	ND		ug/l	2.0	0.19
2-Hexanone	ND		ug/l	5.0	0.52
Chlorobenzene	ND		ug/l	0.50	0.18
Ethylbenzene	ND		ug/l	0.50	0.17
p/m-Xylene	ND		ug/l	1.0	0.33
o-Xylene	ND		ug/l	1.0	0.39
Xylenes, Total	ND		ug/l	1.0	0.33
Styrene	ND		ug/l	1.0	0.36
Bromoform	ND		ug/l	2.0	0.25
Isopropylbenzene	ND		ug/l	0.50	0.19
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/27/23 05:47
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1808860-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	96		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	95		70-130
Dibromofluoromethane	96		70-130

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341411
Report Date: 08/09/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/27/23 05:47
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01-02 Batch: WG1808869-5					
1,4-Dioxane	ND		ug/l	3.0	1.1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	94		70-130
4-Bromofluorobenzene	92		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/28/23 07:20
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 03-06 Batch: WG1809830-5					
Dichlorodifluoromethane	ND		ug/l	5.0	0.24
Chloromethane	ND		ug/l	2.5	0.20
Vinyl chloride	ND		ug/l	1.0	0.07
Bromomethane	ND		ug/l	1.0	0.26
Chloroethane	ND		ug/l	1.0	0.13
Trichlorofluoromethane	ND		ug/l	2.5	0.16
1,1-Dichloroethene	ND		ug/l	0.50	0.17
Carbon disulfide	ND		ug/l	5.0	0.30
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15
Methylene chloride	ND		ug/l	2.5	0.68
Acetone	ND		ug/l	5.0	1.5
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16
Methyl Acetate	ND		ug/l	2.0	0.23
Methyl tert butyl ether	ND		ug/l	1.0	0.17
1,1-Dichloroethane	ND		ug/l	0.75	0.21
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16
Cyclohexane	ND		ug/l	10	0.27
Bromochloromethane	ND		ug/l	2.5	0.15
Chloroform	ND		ug/l	0.75	0.22
Carbon tetrachloride	ND		ug/l	0.50	0.13
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16
2-Butanone	ND		ug/l	5.0	1.9
Benzene	ND		ug/l	0.50	0.16
1,2-Dichloroethane	ND		ug/l	0.50	0.13
Methyl cyclohexane	ND		ug/l	10	0.40
Trichloroethene	ND		ug/l	0.50	0.18
1,2-Dichloropropane	ND		ug/l	1.0	0.14
Bromodichloromethane	ND		ug/l	0.50	0.19

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/28/23 07:20
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 03-06 Batch: WG1809830-5					
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14
Toluene	ND		ug/l	0.75	0.20
Tetrachloroethene	ND		ug/l	0.50	0.18
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14
Dibromochloromethane	ND		ug/l	0.50	0.15
1,2-Dibromoethane	ND		ug/l	2.0	0.19
2-Hexanone	ND		ug/l	5.0	0.52
Chlorobenzene	ND		ug/l	0.50	0.18
Ethylbenzene	ND		ug/l	0.50	0.17
p/m-Xylene	ND		ug/l	1.0	0.33
o-Xylene	ND		ug/l	1.0	0.39
Xylenes, Total	ND		ug/l	1.0	0.33
Styrene	ND		ug/l	1.0	0.36
Bromoform	ND		ug/l	2.0	0.25
Isopropylbenzene	ND		ug/l	0.50	0.19
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/28/23 07:20
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 03-06 Batch: WG1809830-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	94		70-130
Toluene-d8	94		70-130
4-Bromofluorobenzene	90		70-130
Dibromofluoromethane	99		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/28/23 09:05
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1809922-5					
Dichlorodifluoromethane	ND		ug/l	5.0	0.24
Chloromethane	ND		ug/l	2.5	0.20
Vinyl chloride	ND		ug/l	1.0	0.07
Bromomethane	ND		ug/l	1.0	0.26
Chloroethane	ND		ug/l	1.0	0.13
Trichlorofluoromethane	ND		ug/l	2.5	0.16
1,1-Dichloroethene	ND		ug/l	0.50	0.17
Carbon disulfide	ND		ug/l	5.0	0.30
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15
Methylene chloride	ND		ug/l	2.5	0.68
Acetone	ND		ug/l	5.0	1.5
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16
Methyl Acetate	ND		ug/l	2.0	0.23
Methyl tert butyl ether	ND		ug/l	1.0	0.17
1,1-Dichloroethane	ND		ug/l	0.75	0.21
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16
Cyclohexane	ND		ug/l	10	0.27
Bromochloromethane	ND		ug/l	2.5	0.15
Chloroform	ND		ug/l	0.75	0.22
Carbon tetrachloride	ND		ug/l	0.50	0.13
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16
2-Butanone	ND		ug/l	5.0	1.9
Benzene	ND		ug/l	0.50	0.16
1,2-Dichloroethane	ND		ug/l	0.50	0.13
Methyl cyclohexane	ND		ug/l	10	0.40
Trichloroethene	ND		ug/l	0.50	0.18
1,2-Dichloropropane	ND		ug/l	1.0	0.14
Bromodichloromethane	ND		ug/l	0.50	0.19

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/28/23 09:05
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1809922-5					
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14
Toluene	ND		ug/l	0.75	0.20
Tetrachloroethene	ND		ug/l	0.50	0.18
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14
Dibromochloromethane	ND		ug/l	0.50	0.15
1,2-Dibromoethane	ND		ug/l	2.0	0.19
2-Hexanone	ND		ug/l	5.0	0.52
Chlorobenzene	ND		ug/l	0.50	0.18
Ethylbenzene	ND		ug/l	0.50	0.17
p/m-Xylene	ND		ug/l	1.0	0.33
o-Xylene	ND		ug/l	1.0	0.39
Xylenes, Total	ND		ug/l	1.0	0.33
Styrene	ND		ug/l	1.0	0.36
Bromoform	ND		ug/l	2.0	0.25
Isopropylbenzene	ND		ug/l	0.50	0.19
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341411
Report Date: 08/09/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/28/23 09:05
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1809922-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	104		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	104		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/28/23 07:20
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 03-06 Batch: WG1809926-5					
1,4-Dioxane	ND		ug/l	3.0	1.1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	93		70-130
4-Bromofluorobenzene	90		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 117,-
Analytical Date: 08/02/23 08:45
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	
Dissolved Gases by GC - Mansfield Lab for sample(s): 03 Batch: WG1810789-3						
Methane	ND		ug/l	2.00	2.00	A
Ethene	ND		ug/l	0.500	0.500	A
Ethane	ND		ug/l	0.500	0.500	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341411

Report Date: 08/09/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Dissolved Gases by GC - Mansfield Lab Associated sample(s): 02-03 Batch: WG1806862-2								
Carbon Dioxide	95		-		80-120	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341411

Report Date: 08/09/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Dissolved Gases by GC - Mansfield Lab Associated sample(s): 02 Batch: WG1807835-2									
Methane	92		-		80-120	-		25	A
Ethene	85		-		80-120	-		25	A
Ethane	86		-		80-120	-		25	A

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341411
Report Date: 08/09/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG1808860-3 WG1808860-4								
Dichlorodifluoromethane	120		130		36-147	8		20
Chloromethane	110		110		64-130	0		20
Vinyl chloride	120		120		55-140	0		20
Bromomethane	100		100		39-139	0		20
Chloroethane	96		97		55-138	1		20
Trichlorofluoromethane	110		110		62-150	0		20
1,1-Dichloroethene	110		100		61-145	10		20
Carbon disulfide	100		100		51-130	0		20
1,1,2-Trichloro-1,2,2-Trifluoroethane	110		120		70-130	9		20
Methylene chloride	100		100		70-130	0		20
Acetone	120		120		58-148	0		20
trans-1,2-Dichloroethene	110		100		70-130	10		20
Methyl Acetate	120		120		70-130	0		20
Methyl tert butyl ether	110		110		63-130	0		20
1,1-Dichloroethane	110		110		70-130	0		20
cis-1,2-Dichloroethene	100		100		70-130	0		20
Cyclohexane	110		110		70-130	0		20
Bromochloromethane	110		110		70-130	0		20
Chloroform	100		110		70-130	10		20
Carbon tetrachloride	110		110		63-132	0		20
1,1,1-Trichloroethane	110		110		67-130	0		20
2-Butanone	100		100		63-138	0		20
Benzene	100		100		70-130	0		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341411
Report Date: 08/09/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG1808860-3 WG1808860-4								
1,2-Dichloroethane	110		110		70-130	0		20
Methyl cyclohexane	110		100		70-130	10		20
Trichloroethene	110		100		70-130	10		20
1,2-Dichloropropane	100		100		70-130	0		20
Bromodichloromethane	100		100		67-130	0		20
cis-1,3-Dichloropropene	97		97		70-130	0		20
Toluene	110		110		70-130	0		20
Tetrachloroethene	120		120		70-130	0		20
4-Methyl-2-pentanone	92		96		59-130	4		20
trans-1,3-Dichloropropene	100		110		70-130	10		20
1,1,2-Trichloroethane	110		110		70-130	0		20
Dibromochloromethane	100		100		63-130	0		20
1,2-Dibromoethane	110		110		70-130	0		20
2-Hexanone	97		97		57-130	0		20
Chlorobenzene	110		110		75-130	0		20
Ethylbenzene	110		110		70-130	0		20
p/m-Xylene	105		105		70-130	0		20
o-Xylene	105		105		70-130	0		20
Styrene	105		105		70-130	0		20
Bromoform	97		96		54-136	1		20
Isopropylbenzene	110		100		70-130	10		20
1,3-Dichlorobenzene	110		110		70-130	0		20
1,4-Dichlorobenzene	110		110		70-130	0		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341411

Report Date: 08/09/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG1808860-3 WG1808860-4								
1,2-Dichlorobenzene	110		110		70-130	0		20
1,2-Dibromo-3-chloropropane	97		100		41-144	3		20
1,2,4-Trichlorobenzene	110		120		70-130	9		20
1,2,3-Trichlorobenzene	120		110		70-130	9		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	89		93		70-130
Toluene-d8	98		101		70-130
4-Bromofluorobenzene	96		95		70-130
Dibromofluoromethane	92		93		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341411

Report Date: 08/09/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-02 Batch: WG1808869-3 WG1808869-4								
1,4-Dioxane	110		120		70-130	9		25
1,1,2,2-Tetrachloroethane	109		102		70-130	7		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	94		94		70-130
4-Bromofluorobenzene	92		91		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341411
Report Date: 08/09/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 03-06 Batch: WG1809830-3 WG1809830-4								
Dichlorodifluoromethane	120		120		36-147	0		20
Chloromethane	100		100		64-130	0		20
Vinyl chloride	110		110		55-140	0		20
Bromomethane	88		98		39-139	11		20
Chloroethane	99		99		55-138	0		20
Trichlorofluoromethane	110		110		62-150	0		20
1,1-Dichloroethene	110		100		61-145	10		20
Carbon disulfide	100		100		51-130	0		20
1,1,2-Trichloro-1,2,2-Trifluoroethane	110		120		70-130	9		20
Methylene chloride	100		100		70-130	0		20
Acetone	120		120		58-148	0		20
trans-1,2-Dichloroethene	100		100		70-130	0		20
Methyl Acetate	120		110		70-130	9		20
Methyl tert butyl ether	100		110		63-130	10		20
1,1-Dichloroethane	100		100		70-130	0		20
cis-1,2-Dichloroethene	100		110		70-130	10		20
Cyclohexane	100		100		70-130	0		20
Bromochloromethane	100		110		70-130	10		20
Chloroform	100		100		70-130	0		20
Carbon tetrachloride	100		100		63-132	0		20
1,1,1-Trichloroethane	110		110		67-130	0		20
2-Butanone	99		97		63-138	2		20
Benzene	98		99		70-130	1		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341411
Report Date: 08/09/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 03-06 Batch: WG1809830-3 WG1809830-4								
1,2-Dichloroethane	110		110		70-130	0		20
Methyl cyclohexane	99		100		70-130	1		20
Trichloroethene	97		98		70-130	1		20
1,2-Dichloropropane	95		97		70-130	2		20
Bromodichloromethane	98		99		67-130	1		20
cis-1,3-Dichloropropene	93		94		70-130	1		20
Toluene	100		100		70-130	0		20
Tetrachloroethene	110		100		70-130	10		20
4-Methyl-2-pentanone	90		90		59-130	0		20
trans-1,3-Dichloropropene	95		93		70-130	2		20
1,1,2-Trichloroethane	98		95		70-130	3		20
Dibromochloromethane	96		98		63-130	2		20
1,2-Dibromoethane	100		98		70-130	2		20
2-Hexanone	100		98		57-130	2		20
Chlorobenzene	100		100		75-130	0		20
Ethylbenzene	100		100		70-130	0		20
p/m-Xylene	100		100		70-130	0		20
o-Xylene	100		100		70-130	0		20
Styrene	100		100		70-130	0		20
Bromoform	90		90		54-136	0		20
Isopropylbenzene	99		97		70-130	2		20
1,3-Dichlorobenzene	100		100		70-130	0		20
1,4-Dichlorobenzene	100		100		70-130	0		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341411

Report Date: 08/09/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 03-06 Batch: WG1809830-3 WG1809830-4								
1,2-Dichlorobenzene	100		100		70-130	0		20
1,2-Dibromo-3-chloropropane	95		94		41-144	1		20
1,2,4-Trichlorobenzene	100		100		70-130	0		20
1,2,3-Trichlorobenzene	110		110		70-130	0		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	95		94		70-130
Toluene-d8	96		95		70-130
4-Bromofluorobenzene	93		91		70-130
Dibromofluoromethane	95		95		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341411
Report Date: 08/09/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1809922-3 WG1809922-4								
Dichlorodifluoromethane	130		130		36-147	0		20
Chloromethane	110		110		64-130	0		20
Vinyl chloride	120		120		55-140	0		20
Bromomethane	83		88		39-139	6		20
Chloroethane	96		100		55-138	4		20
Trichlorofluoromethane	110		100		62-150	10		20
1,1-Dichloroethene	110		110		61-145	0		20
Carbon disulfide	100		110		51-130	10		20
1,1,2-Trichloro-1,2,2-Trifluoroethane	120		110		70-130	9		20
Methylene chloride	100		100		70-130	0		20
Acetone	130		120		58-148	8		20
trans-1,2-Dichloroethene	110		110		70-130	0		20
Methyl Acetate	120		120		70-130	0		20
Methyl tert butyl ether	100		100		63-130	0		20
1,1-Dichloroethane	110		110		70-130	0		20
cis-1,2-Dichloroethene	100		100		70-130	0		20
Cyclohexane	110		110		70-130	0		20
Bromochloromethane	110		110		70-130	0		20
Chloroform	100		100		70-130	0		20
Carbon tetrachloride	110		110		63-132	0		20
1,1,1-Trichloroethane	110		110		67-130	0		20
2-Butanone	98		110		63-138	12		20
Benzene	99		100		70-130	1		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341411
Report Date: 08/09/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1809922-3 WG1809922-4								
1,2-Dichloroethane	110		110		70-130	0		20
Methyl cyclohexane	100		100		70-130	0		20
Trichloroethene	100		110		70-130	10		20
1,2-Dichloropropane	96		98		70-130	2		20
Bromodichloromethane	100		100		67-130	0		20
cis-1,3-Dichloropropene	93		93		70-130	0		20
Toluene	100		100		70-130	0		20
Tetrachloroethene	110		120		70-130	9		20
4-Methyl-2-pentanone	91		97		59-130	6		20
trans-1,3-Dichloropropene	97		97		70-130	0		20
1,1,2-Trichloroethane	100		100		70-130	0		20
Dibromochloromethane	95		98		63-130	3		20
1,2-Dibromoethane	97		100		70-130	3		20
2-Hexanone	99		97		57-130	2		20
Chlorobenzene	100		100		75-130	0		20
Ethylbenzene	100		110		70-130	10		20
p/m-Xylene	105		105		70-130	0		20
o-Xylene	105		105		70-130	0		20
Styrene	100		105		70-130	5		20
Bromoform	88		91		54-136	3		20
Isopropylbenzene	100		100		70-130	0		20
1,3-Dichlorobenzene	110		110		70-130	0		20
1,4-Dichlorobenzene	100		110		70-130	10		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341411

Report Date: 08/09/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1809922-3 WG1809922-4								
1,2-Dichlorobenzene	100		110		70-130	10		20
1,2-Dibromo-3-chloropropane	93		95		41-144	2		20
1,2,4-Trichlorobenzene	110		110		70-130	0		20
1,2,3-Trichlorobenzene	110		110		70-130	0		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	93		93		70-130
Toluene-d8	97		97		70-130
4-Bromofluorobenzene	93		96		70-130
Dibromofluoromethane	95		97		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341411

Report Date: 08/09/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 03-06 Batch: WG1809926-3 WG1809926-4								
1,4-Dioxane	87		120		70-130	**32**	Q	25
1,1,2,2-Tetrachloroethane	109		108		70-130	1		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	95		95		70-130
4-Bromofluorobenzene	92		92		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341411

Report Date: 08/09/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Dissolved Gases by GC - Mansfield Lab Associated sample(s): 03 Batch: WG1810789-2									
Methane	116		-		80-120	-		25	A
Ethene	107		-		80-120	-		25	A
Ethane	108		-		80-120	-		25	A

Matrix Spike Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341411

Report Date: 08/09/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits	Column
Dissolved Gases by GC - Mansfield Lab Associated sample(s): 03 QC Batch ID: WG1810789-5 QC Sample: L2341411-03 Client ID: S-435_20230719													
Methane	ND	54.6	68.8	**126**	Q	-	-		80-120	-		25	A
Ethene	ND	95.5	111	116		-	-		80-120	-		25	A
Ethane	ND	102	117	114		-	-		80-120	-		25	A

PETROLEUM HYDROCARBONS

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-02
Client ID: S-484_20230719
Sample Location: FORMER PHL REFINERY

Date Collected: 07/19/23 08:40
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/27/23 12:45
Analyst: MTC

Extraction Method: EPA 3510C
Extraction Date: 07/25/23 12:58

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	616		ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	70		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-02 D
Client ID: S-484_20230719
Sample Location: FORMER PHL REFINERY

Date Collected: 07/19/23 08:40
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/26/23 14:08
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	790000		ug/l	50000	3000	1000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	114		70-130
4-Bromofluorobenzene	113		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-03
Client ID: S-435_20230719
Sample Location: FORMER PHL REFINERY

Date Collected: 07/19/23 09:55
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/26/23 14:39
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	79		ug/l	50	3.0	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	113		70-130
4-Bromofluorobenzene	117		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-03
Client ID: S-435_20230719
Sample Location: FORMER PHL REFINERY

Date Collected: 07/19/23 09:55
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/27/23 13:20
Analyst: MTC

Extraction Method: EPA 3510C
Extraction Date: 07/25/23 12:58

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	186	J	ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	61		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-04 D
Client ID: BF-106_20230719
Sample Location: FORMER PHIL REFINERY

Date Collected: 07/19/23 13:10
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/26/23 15:10
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	2700		ug/l	100	6.1	2

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	81		70-130
4-Bromofluorobenzene	105		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-04 D
Client ID: BF-106_20230719
Sample Location: FORMER PHIL REFINERY

Date Collected: 07/19/23 13:10
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/28/23 16:28
Analyst: MTC

Extraction Method: EPA 3510C
Extraction Date: 07/25/23 12:58

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	14000		ug/l	1000	172.	2

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	44		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-05
Client ID: BF-99_20230719
Sample Location: FORMER PHIL REFINERY

Date Collected: 07/19/23 12:25
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/26/23 15:41
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	600		ug/l	50	3.0	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	116		70-130
4-Bromofluorobenzene	116		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-05
Client ID: BF-99_20230719
Sample Location: FORMER PHIL REFINERY

Date Collected: 07/19/23 12:25
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/27/23 14:30
Analyst: MTC

Extraction Method: EPA 3510C
Extraction Date: 07/25/23 12:58

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	4400		ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	62		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-06
Client ID: S-434_20230719
Sample Location: FORMER PHIL REFINERY

Date Collected: 07/19/23 11:05
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/26/23 16:12
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	63		ug/l	50	3.0	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	118		70-130
4-Bromofluorobenzene	124		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-06
Client ID: S-434_20230719
Sample Location: FORMER PHIL REFINERY

Date Collected: 07/19/23 11:05
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/27/23 13:55
Analyst: MTC

Extraction Method: EPA 3510C
Extraction Date: 07/25/23 12:58

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	151	J	ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	57		40-140

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341411
Report Date: 08/09/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 07/27/23 11:00
Analyst: MTC

Extraction Method: EPA 3510C
Extraction Date: 07/25/23 12:58

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 02-06 Batch: WG1807432-1					
TPH (C9-C44)	237	J	ug/l	500	86.2

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	54		40-140

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341411
Report Date: 08/09/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 07/26/23 12:04
Analyst: BAD

Parameter	Result	Qualifier	Units	RL	MDL
Gasoline Range Organics - Westborough Lab for sample(s): 02-06 Batch: WG1808557-4					
Gasoline Range Organics	16	J	ug/l	50	3.0

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	102		70-130
4-Bromofluorobenzene	99		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341411

Report Date: 08/09/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 02-06 Batch: WG1807432-2								
TPH (C9-C44)	58		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	52				40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341411

Report Date: 08/09/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Gasoline Range Organics - Westborough Lab	Associated sample(s): 02-06		Batch: WG1808557-2		WG1808557-3			
Gasoline Range Organics	93		101		80-120	8		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,1,1-Trifluorotoluene	105		113		70-130
4-Bromofluorobenzene	103		111		70-130

METALS

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-02
Client ID: S-484_20230719
Sample Location: FORMER PHL REFINERY
Date Collected: 07/19/23 08:40
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	132000		ug/l	100.	35.0	1	07/25/23 15:53	08/09/23 09:44	EPA 3005A	1,6010D	JMF
Iron, Total	20900		ug/l	50.0	9.00	1	07/25/23 15:53	08/09/23 09:44	EPA 3005A	1,6010D	JMF
Magnesium, Total	19000		ug/l	100.	15.3	1	07/25/23 15:53	08/09/23 09:44	EPA 3005A	1,6010D	JMF
Potassium, Total	8520		ug/l	2500	237.	1	07/25/23 15:53	08/09/23 09:44	EPA 3005A	1,6010D	JMF
Sodium, Total	57100		ug/l	2000	120.	1	07/25/23 15:53	08/09/23 09:44	EPA 3005A	1,6010D	JMF

Project Name: PESRM UDEX RELEASE
Lab Number: L2341411
Project Number: 213403039
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-03
Client ID: S-435_20230719
Sample Location: FORMER PHL REFINERY
Date Collected: 07/19/23 09:55
Date Received: 07/19/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	198000		ug/l	100.	35.0	1	07/25/23 15:53	08/09/23 09:34	EPA 3005A	1,6010D	JMF
Iron, Total	939.		ug/l	50.0	9.00	1	07/25/23 15:53	08/09/23 09:34	EPA 3005A	1,6010D	JMF
Magnesium, Total	90300		ug/l	100.	15.3	1	07/25/23 15:53	08/09/23 09:34	EPA 3005A	1,6010D	JMF
Potassium, Total	12100		ug/l	2500	237.	1	07/25/23 15:53	08/09/23 09:34	EPA 3005A	1,6010D	JMF
Sodium, Total	274000		ug/l	2000	120.	1	07/25/23 15:53	08/09/23 09:34	EPA 3005A	1,6010D	JMF

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341411

Project Number: 213403039 **Report Date:** 08/09/23

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 02-03 Batch: WG1807431-1										
Calcium, Total	ND		ug/l	100	35.0	1	07/25/23 15:53	08/09/23 09:26	1,6010D	JMF
Iron, Total	ND		ug/l	50.0	9.00	1	07/25/23 15:53	08/09/23 09:26	1,6010D	JMF
Magnesium, Total	ND		ug/l	100	15.3	1	07/25/23 15:53	08/09/23 09:26	1,6010D	JMF
Potassium, Total	ND		ug/l	2500	237.	1	07/25/23 15:53	08/09/23 09:26	1,6010D	JMF
Sodium, Total	254.	J	ug/l	2000	120.	1	07/25/23 15:53	08/09/23 09:26	1,6010D	JMF

Prep Information

Digestion Method: EPA 3005A

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341411

Report Date: 08/09/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 02-03 Batch: WG1807431-2								
Calcium, Total	102		-		80-120	-		
Iron, Total	100		-		80-120	-		
Magnesium, Total	98		-		80-120	-		
Potassium, Total	115		-		80-120	-		
Sodium, Total	113		-		80-120	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341411
Report Date: 08/09/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 02-03 QC Batch ID: WG1807431-3 QC Sample: L2341411-02 Client ID: S-484_20230719												
Calcium, Total	132000	10000	140000	80		-	-		75-125	-		20
Iron, Total	20900	1000	21900	100		-	-		75-125	-		20
Magnesium, Total	19000	10000	29400	104		-	-		75-125	-		20
Potassium, Total	8520	10000	21400	**129**	Q	-	-		75-125	-		20
Sodium, Total	57100	10000	70900	**138**	Q	-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341411

Report Date: 08/09/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 02-03 QC Batch ID: WG1807431-4 QC Sample: L2341411-02 Client ID: S-484_20230719						
Calcium, Total	132000	122000	ug/l	8		20
Iron, Total	20900	19800	ug/l	5		20
Magnesium, Total	19000	18400	ug/l	3		20
Potassium, Total	8520	8110	ug/l	5		20
Sodium, Total	57100	54600	ug/l	4		20

INORGANICS
&
MISCELLANEOUS

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341411
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-02
Client ID: S-484_20230719
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/19/23 08:40
Date Received: 07/19/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Alkalinity, Bicarbonate	224000		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	215000		ug/l	5000	839.	10	-	08/01/23 19:58	44,300.0	CVN
Nitrogen, Nitrate	ND		ug/l	50.0	12.8	1	-	07/20/23 17:33	44,300.0	CVN
Sulfate	14600		ug/l	1000	454.	1	-	07/20/23 17:33	44,300.0	CVN

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341411
Report Date: 08/09/23

SAMPLE RESULTS

Lab ID: L2341411-03
Client ID: S-435_20230719
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/19/23 09:55
Date Received: 07/19/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Alkalinity, Bicarbonate	105000		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	820000		ug/l	50000	8390	100	-	07/20/23 19:57	44,300.0	CVN
Nitrogen, Nitrate	ND		ug/l	50.0	12.8	1	-	07/20/23 13:55	44,300.0	CVN
Sulfate	58200		ug/l	1000	454.	1	-	07/20/23 13:55	44,300.0	CVN

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341411
Report Date: 08/09/23

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Anions by Ion Chromatography - Westborough Lab for sample(s): 02-03 Batch: WG1805667-1										
Chloride	ND		ug/l	500	83.9	1	-	07/20/23 09:32	44,300.0	CVN
Nitrogen, Nitrate	ND		ug/l	50.0	12.8	1	-	07/20/23 09:32	44,300.0	CVN
Sulfate	ND		ug/l	1000	454.	1	-	07/20/23 09:32	44,300.0	CVN
General Chemistry - Westborough Lab for sample(s): 02-03 Batch: WG1810434-1										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
General Chemistry - Westborough Lab for sample(s): 02-03 Batch: WG1810437-1										
Alkalinity, Bicarbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab for sample(s): 02 Batch: WG1810460-1										
Chloride	ND		ug/l	500	83.9	1	-	08/01/23 18:22	44,300.0	CVN

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341411

Report Date: 08/09/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 02-03 Batch: WG1805667-2								
Chloride	103		-		90-110	-		
Nitrogen, Nitrate	103		-		90-110	-		
Sulfate	103		-		90-110	-		
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 02 Batch: WG1810460-2								
Chloride	104		-		90-110	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341411
Report Date: 08/09/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1810460-3 QC Sample: L2342055-01 Client ID: MS Sample												
Chloride	4960	4000	9000	101		-	-		90-110	-		18

Lab Duplicate Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341411

Report Date: 08/09/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02-03 QC Batch ID: WG1810434-3 QC Sample: L2341781-02 Client ID: DUP Sample						
Alkalinity, Carbonate	ND	ND	ug CaCO3/L	NC		10
General Chemistry - Westborough Lab Associated sample(s): 02-03 QC Batch ID: WG1810437-3 QC Sample: L2341781-02 Client ID: DUP Sample						
Alkalinity, Bicarbonate	336000	339000	ug CaCO3/L	1		9
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1810460-4 QC Sample: L2342055-01 Client ID: DUP Sample						
Chloride	4960	4950	ug/l	0		18

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341411
Report Date: 08/09/23

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent
B	Absent
C	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2341411-01A	Vial HCl preserved	A	NA		15.5	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341411-01B	Vial HCl preserved	A	NA		15.5	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341411-02A	Vial HCl preserved	A	NA		15.5	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341411-02B	Vial HCl preserved	A	NA		15.5	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341411-02C	Vial HCl preserved	A	NA		15.5	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341411-02D	20ml Vial HCl preserved	A	NA		15.5	Y	Absent		DISSGAS(14)
L2341411-02E	20ml Vial HCl preserved	A	NA		15.5	Y	Absent		DISSGAS(14)
L2341411-02F	Vial HCl preserved	A	NA		15.5	Y	Absent		PA-TPH-GRO(14)
L2341411-02G	Vial HCl preserved	A	NA		15.5	Y	Absent		PA-TPH-GRO(14)
L2341411-02H	Vial HCl preserved	A	NA		15.5	Y	Absent		PA-TPH-GRO(14)
L2341411-02J	Vial unpreserved 20ml	A	NA		15.5	Y	Absent		DISSGAS-CO2(7)
L2341411-02K	Vial unpreserved 20ml	A	NA		15.5	Y	Absent		DISSGAS-CO2(7)
L2341411-02L	Plastic 250ml unpreserved	A	7	7	15.5	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2341411-02M	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	15.5	Y	Absent		SUB-SULFIDE()
L2341411-02N	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	15.5	Y	Absent		SUB-SULFIDE()
L2341411-02O	Plastic 250ml HNO3 preserved	A	<2	<2	15.5	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),K-TI-PPB(180),NA-TI-PPB(180),FE-TI-PPB(180)
L2341411-02P	Plastic 500ml unpreserved/No Headspace	A	NA		15.5	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2341411-02Q	Amber 500ml unpreserved	A	7	7	15.5	Y	Absent		PA-TPH-DROD-C44(7)
L2341411-02R	Amber 500ml unpreserved	A	7	7	15.5	Y	Absent		PA-TPH-DROD-C44(7)
L2341411-02S	Amber 500ml unpreserved	A	7	7	15.5	Y	Absent		PA-TPH-DROD-C44(7)

*Values in parentheses indicate holding time in days

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341411
Report Date: 08/09/23

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2341411-02T	Amber 500ml unpreserved	A	7	7	15.5	Y	Absent		PA-TPH-DROD-C44(7)
L2341411-02U	Amber 500ml unpreserved	A	7	7	15.5	Y	Absent		PA-TPH-DROD-C44(7)
L2341411-02V	Amber 500ml unpreserved	A	7	7	15.5	Y	Absent		PA-TPH-DROD-C44(7)
L2341411-03A	Vial HCl preserved	C	NA		4.1	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341411-03B	Vial HCl preserved	C	NA		4.1	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341411-03C	Vial HCl preserved	C	NA		4.1	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341411-03D	20ml Vial HCl preserved	C	NA		4.1	Y	Absent		DISSGAS(14)
L2341411-03E	20ml Vial HCl preserved	C	NA		4.1	Y	Absent		DISSGAS(14)
L2341411-03F	Vial HCl preserved	C	NA		4.1	Y	Absent		PA-TPH-GRO(14)
L2341411-03G	Vial HCl preserved	C	NA		4.1	Y	Absent		PA-TPH-GRO(14)
L2341411-03H	Vial HCl preserved	C	NA		4.1	Y	Absent		PA-TPH-GRO(14)
L2341411-03J	Vial unpreserved 20ml	C	NA		4.1	Y	Absent		DISSGAS-CO2(7)
L2341411-03K	Vial unpreserved 20ml	C	NA		4.1	Y	Absent		DISSGAS-CO2(7)
L2341411-03L	Plastic 250ml unpreserved	C	6	6	4.1	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2341411-03M	Plastic 250ml Zn Acetate/NaOH preserved	C	>9	>9	4.1	Y	Absent		SUB-SULFIDE()
L2341411-03N	Plastic 250ml Zn Acetate/NaOH preserved	C	>9	>9	4.1	Y	Absent		SUB-SULFIDE()
L2341411-03O	Plastic 250ml HNO3 preserved	C	<2	<2	4.1	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),K-TI-PPB(180),NA-TI-PPB(180),FE-TI-PPB(180)
L2341411-03P	Plastic 500ml unpreserved/No Headspace	C	NA		4.1	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2341411-03Q	Amber 500ml unpreserved	C	6	6	4.1	Y	Absent		PA-TPH-DROD-C44(7)
L2341411-03R	Amber 500ml unpreserved	C	6	6	4.1	Y	Absent		PA-TPH-DROD-C44(7)
L2341411-03S	Amber 500ml unpreserved	C	6	6	4.1	Y	Absent		PA-TPH-DROD-C44(7)
L2341411-03T	Amber 500ml unpreserved	C	6	6	4.1	Y	Absent		PA-TPH-DROD-C44(7)
L2341411-03U	Amber 500ml unpreserved	C	6	6	4.1	Y	Absent		PA-TPH-DROD-C44(7)
L2341411-03V	Amber 500ml unpreserved	C	6	6	4.1	Y	Absent		PA-TPH-DROD-C44(7)
L2341411-04A	Vial HCl preserved	B	NA		4.1	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341411-04B	Vial HCl preserved	B	NA		4.1	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341411-04C	Vial HCl preserved	B	NA		4.1	Y	Absent		PA-8260-SIM(14),PA-8260(14)

*Values in parentheses indicate holding time in days

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341411
Report Date: 08/09/23

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2341411-04D	Vial HCl preserved	B	NA		4.1	Y	Absent		PA-TPH-GRO(14)
L2341411-04E	Vial HCl preserved	B	NA		4.1	Y	Absent		PA-TPH-GRO(14)
L2341411-04F	Vial HCl preserved	B	NA		4.1	Y	Absent		PA-TPH-GRO(14)
L2341411-04G	Amber 500ml unpreserved	B	7	7	4.1	Y	Absent		PA-TPH-DROD-C44(7)
L2341411-04H	Amber 500ml unpreserved	B	7	7	4.1	Y	Absent		PA-TPH-DROD-C44(7)
L2341411-05A	Vial HCl preserved	A	NA		15.5	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341411-05B	Vial HCl preserved	A	NA		15.5	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341411-05C	Vial HCl preserved	A	NA		15.5	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341411-05D	Vial HCl preserved	A	NA		15.5	Y	Absent		PA-TPH-GRO(14)
L2341411-05E	Vial HCl preserved	A	NA		15.5	Y	Absent		PA-TPH-GRO(14)
L2341411-05F	Vial HCl preserved	A	NA		15.5	Y	Absent		PA-TPH-GRO(14)
L2341411-05G	Amber 500ml unpreserved	A	7	7	15.5	Y	Absent		PA-TPH-DROD-C44(7)
L2341411-05H	Amber 500ml unpreserved	A	7	7	15.5	Y	Absent		PA-TPH-DROD-C44(7)
L2341411-06A	Vial HCl preserved	A	NA		15.5	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341411-06B	Vial HCl preserved	A	NA		15.5	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341411-06C	Vial HCl preserved	A	NA		15.5	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341411-06D	Vial HCl preserved	A	NA		15.5	Y	Absent		PA-TPH-GRO(14)
L2341411-06E	Vial HCl preserved	A	NA		15.5	Y	Absent		PA-TPH-GRO(14)
L2341411-06F	Vial HCl preserved	A	NA		15.5	Y	Absent		PA-TPH-GRO(14)
L2341411-06G	Amber 500ml unpreserved	A	7	7	15.5	Y	Absent		PA-TPH-DROD-C44(7)
L2341411-06H	Amber 500ml unpreserved	A	7	7	15.5	Y	Absent		PA-TPH-DROD-C44(7)

*Values in parentheses indicate holding time in days

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2341411
Project Number:	213403039	**Report Date:**	08/09/23

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: DU Report with 'J' Qualifiers

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2341411
Project Number:	213403039	**Report Date:**	08/09/23

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively

Report Format: DU Report with 'J' Qualifiers

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2341411
Project Number:	213403039	**Report Date:**	08/09/23

Data Qualifiers

Identified Compounds (TICs). For calculated parameters, this represents that one or more values used in the calculation were estimated.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

ND - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2341411
Project Number:	213403039	**Report Date:**	08/09/23

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.

44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.

117 Technical Guidance for the Natural Attenuation Indicators: Methane, Ethane, and Ethene, EPA-NE, Revision 1, February 21, 2002 and Sample Preparation & Calculations for Dissolved Gas Analysis in Water Samples using a GC Headspace Equilibration Technique, EPA RSKSOP-175, Revision 2, May 2004.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 7/20/23

ALPHA Job #: L2341411

Westborough, MA
TEL: 508-898-9220
FAX: 508-898-9193

Mansfield, MA
TEL: 508-822-9300
FAX: 508-822-3288

Client Information

Client: PESRM c/o Stantec
Address: 1060 Andrew Drive, Suite 140
West Chester, PA 19380
Phone: 610-840-2500
Fax: 610-840-2501
Email: andrew.klingbeil@stantec.com
☐ These samples have been Previously analyzed by Alpha

Project Information

Project Name: PESRM UDEX Release
Project Location: Former PHL Refinery
Project #: 213403039
Project Manager: Andrew Klingbeil
ALPHA Quote #: 21953

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)
Due Date: Time:

Report Information Data Deliverables

☐ FAX ☒ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program: PA One Cleanup
Criteria:

Other Project Specific Requirements/Comments/Detection Limits:
See quote 21953 and July 14, 2023 email from Andrew K for details on analyses

ANALYSIS

SAMPLE HANDLING
Filtration
☐ Done
☒ Not Needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	PA Vollatile Organics 8260C	TPH - GRO, Extended Ranges 8015D	Alkalinity (Carb and Bicarb) 2320B	Chloride,Sulfate,Nitrate 300	Dissolved gases (incl CO2)	Total Ca, Fe, Mg, K, Na 6010D	Sulfide SM 4500						Sample Specific Comments	TOTAL # BOTTLES
1411 - 01	Trip Blank	--	--	TB	--	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
02	S-484_20230719	7/19/23	8:40	GW	BO	☒	☒	☒	☒	☒	☒	☒	☐	☐	☐	☐	☐		
03	S-435_20230719	7/19/23	9:55	GW	BO	☒	☒	☒	☒	☒	☒	☒	☐	☐	☐	☐	☐		
04	BF-106_20230719	7/19/23	13:10	GW	BO	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
05	BF-99_20230719	7/19/23	12:25	GW	BO	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
06	BF-434_20230719	7/19/23	11:05	GW	BO	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
				Container Type		-	-	-	-	-	-	-	-	-	-	-	-		
				Preservative		-	-	-	-	-	-	-	-	-	-	-	-		

Relinquished By:	Date/Time	Received By:	Date/Time
BOB	7/19/23 1440	Nelson L AAL	7.19.23 1440
Nelson L AAL	7.19.23 1510		
	7-19-23		7/19/23 22:30
AAL	7/20/23 00:20		7/20/23 0020

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

FORM NO: 01-01(I-NJ) (rev. 5-JAN-12)

Pace Analytical Services, LLC
575 Broad Hollow Road
Melville, NY 11747
516-370-6000

August 02, 2023

Reports
Alpha Analytical
8 Walkup Drive
Westborough, MA 01581

RE: Project: L2341411
Pace Project No.: 70264104

Dear Reports:

Enclosed are the analytical results for sample(s) received by the laboratory on July 21, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Melville

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Wayne Bryce
wayne.bryce@pacelabs.com
(631)694-3040
Project Manager

Enclosures

cc: Michael Chang, Alpha Analytical
Candy Fox, Alpha Analytical
Ben Rao, Alpha Analytical

Pace Analytical Services, LLC
575 Broad Hollow Road
Melville, NY 11747
516-370-6000

CERTIFICATIONS

Project: L2341411
Pace Project No.: 70264104

Pace Analytical Services Long Island
575 Broad Hollow Rd, Melville, NY 11747
Connecticut Certification #: PH-0435
Delaware Certification # NY 10478
Maryland Certification #: 208
Massachusetts Certification #: M-NY026
New Hampshire Certification #: 2987
New Jersey Certification #: NY158
New York Certification #: 10478 Primary Accrediting Body
Pennsylvania Certification #: 68-00350
Rhode Island Certification #: LAO00340
Virginia Certification # 460302

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Pace Analytical Services, LLC
575 Broad Hollow Road
Melville, NY 11747
516-370-6000

ANALYTICAL RESULTS

Project: L2341411
Pace Project No.: 70264104

Sample: S-484_20230719 **Lab ID: 70264104001** Collected: 07/19/23 08:40 Received: 07/21/23 08:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
9034 Sulfide, Titration	Analytical Method: EPA 9034 Preparation Method: EPA 9030B Pace Analytical Services - Melville							
Sulfide	**3.2**	mg/L	2.0	1	08/02/23 07:18	08/02/23 11:43		H1,H2

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
575 Broad Hollow Road
Melville, NY 11747
516-370-6000

ANALYTICAL RESULTS

Project: L2341411
Pace Project No.: 70264104

Sample: S-435_20230719 **Lab ID: 70264104002** Collected: 07/19/23 09:55 Received: 07/21/23 08:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
9034 Sulfide, Titration	Analytical Method: EPA 9034 Preparation Method: EPA 9030B Pace Analytical Services - Melville							
Sulfide	**<2.0**	mg/L	2.0	1	08/02/23 07:18	08/02/23 11:47		H1,H2

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
575 Broad Hollow Road
Melville, NY 11747
516-370-6000

QUALITY CONTROL DATA

Project: L2341411
Pace Project No.: 70264104

QC Batch: 314585
QC Batch Method: EPA 9030B
Analysis Method: EPA 9034
Analysis Description: 9034 Sulfide Waste Water
Laboratory: Pace Analytical Services - Melville
Associated Lab Samples: 70264104001, 70264104002

METHOD BLANK: 1600256 Matrix: Water
Associated Lab Samples: 70264104001, 70264104002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfide	mg/L	<2.0	2.0	08/02/23 11:29	

LABORATORY CONTROL SAMPLE & LCSD: 1600257 1600258

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Sulfide	mg/L	56.1	51.2	52.8	91	94	80-120	3	20	

SAMPLE DUPLICATE: 1600259

Parameter	Units	70264104002 Result	Dup Result	RPD	Qualifiers
Sulfide	mg/L	<2.0	<2.0		H1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
575 Broad Hollow Road
Melville, NY 11747
516-370-6000

QUALIFIERS

Project: L2341411
Pace Project No.: 70264104

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

H1	Analysis conducted outside the EPA method holding time.
H2	Extraction or preparation conducted outside EPA method holding time.

REPORT OF LABORATORY ANALYSIS

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Melville, NY 11747
516-370-6000

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: L2341411
Pace Project No.: 70264104

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
70264104001	**S-484_20230719**	EPA 9030B	314585	EPA 9034	314669
70264104002	**S-435_20230719**	EPA 9030B	314585	EPA 9034	314669

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WO# : 70264104

70264104

ubcontract Chain of Custody

Analytical (NY)
Broad Hollow Road
lle, NY 11747

Alpha Job Number
L2341411

Client Information	Project Information	Regulatory Requirements/Report Limits
Client: Alpha Analytical Labs Address: Eight Walkup Drive Westborough, MA 01581-1019 Phone: 508.439.5155 Email: mvitanza@alphalab.com	Project Location: PA Project Manager: Marty Vitanza **Turnaround & Deliverables Information** Due Date: Deliverables:	State/Federal Program: Regulatory Criteria:

Project Specific Requirements and/or Report Requirements

Reference following Alpha Job Number on final report/deliverables: L2341411

Report to include Method Blank, LCS/LCSD:

Additional Comments: Send all results/reports to subreports@alphalab.com

Lab ID	Client ID	Collection Date/Time	Sample Matrix	Analysis	Batch QC
	S-484_20230719	07-19-23 08:40	WATER	Sulfide	
	S-435_20230719	07-19-23 09:55	WATER	Sulfide	

	Relinquished By:	Date/Time:	Received By:	Date/Time:
	[signature]	7/20/23	[signature] FAC	7/20/23 17:30
	[signature] AAL	7/20/23 22:30	[signature]	7/20/23 02:35
	[signature]	7/20/23	Andy Buddie Pace LI	7/21/23 8:30

Form No: AL_subcoc

Serial_No:08092317:40

DC Title: ENV-FRM-MELV-0150 v1_Sample Container Count Melville
Effective Date: 4/10/2023

WO#: 70264104

PM: WB **Due Date: 08/01/23**

CLIENT: ALPHA

Client: ALPHA

Profile #: 5378

Work ID: L2341411

COC Page _____ of _____

☐ Use P

☐ Add S

COC Line Item	Matrix	VG9U	VG9C	VG9H	VG9S	VG9T	DG9Y	DG9P	DG9A	DG6T	DG9S	AG4U	AG3U	AG2U	AG1U	AG34	AG3S	AG4E	AG3T	AG2R	AG1T	AG1H	AG1A	CG1U	BP4U	BP3U	BP2U	BP1U	BP3S	BP2S	BP4N	BP3N	BP2N	BP3C	BP3T	BP35	BP3R	BP1Z	BP1N	BP1B	SP5T	R	WG2U	WGFU	WGKU	WGDU	ZPLC	GN	WP	IOC	SOC
1																													2																								
2																													2																								
3																																																				
4																																																				
5																																																				
6																																																				
7																																																				
8																																																				
9																																																				
10																																																				
11																																																				
12																																																				

Container Codes

Glass				Plastic		Misc.	
VG9U	40mL unpres clear vial	AG4U	125mL unpres amber glass	BP4U	125mL unpreserved plastic	SP5T	120mL Coliform Na Thio
VG9C	40mL Ascorbic-HCl clear vial	AG3U	250mL unpres amber glass	BP3U	250mL unpreserved plastic	R	Terracore Kit
VG9H	40mL HCl clear vial	AG2U	500mL unpres amber glass	BP2U	500mL unpreserved plastic	WG2U	2oz Unpreserved Jar
VG9S	40mL Sulfuirc clear vial	AG1U	1liter unpres amber glass	BP1U	1L unpreserved plastic	WGFU	4oz Unpreserved Jar
DG9T	40mL Na Thiosulfate vial	AG34	Ammonium Cl 250mL bottle	BP4N	125mL HNO3 plastic	WGKU	8oz Unpreserved Jar
DG9Y	40mL Citrate-Na Thiosulfate	AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	WGDU	16oz Unpreserved Jar
DG9P	40mL amber vial - TSP	AG4E	125mL EDA amber glass	BP2N	500mL HNO3 plastic	ZPLC	Ziplock Bag
DG9A	Ascorbic/Maleic Acid 40mL	AG3T	250mL Na Thio amber glass	BP3S	250mL H2SO4 plastic	TEDL	Tedlar Bag
DG6T	Na Thio 60mL Vial	AG2R	Na Sulfite 500mL (blue Cap)	BP2S	500mL H2SO4 plastic	BG1H	1L HCL Clear Glass
DG9S	Ammonium Cl/CuSO4 40mL	AG1T	Na Thiosulfate 1L bottle	BP3C	NaOH 250mL bottle	GN	General
CG1U	1L Unpres Jar (Con Ed)	AG1H	1L HCl amber glass	BP3T	250mL Trizma	WP	Wipe
		AG1A	(NH4Cl)	BP35	250mL Ammonium Acetate		
WG9O	8oz clear soil jar			BP3R	250mL NH4SO4-NH4OH		
WG4O	4oz clear soil jar			BP1Z	1L NaOH, Zn Acetate		
				BP1N	1L HNO3 plastic		
				BP1B	Na Thiosulfate Amber Bottle		

IOC	
BP1U	1L unpreserved plastic
BP3N*	250mL HNO3 plastic
BP3C	250mL Sodium Hydroxide
AG2U	500mL unpres amber glass

* Can also be a BP4N

Matrix	
WT	Water
SL	Solid
NAL	Non-aqueous Liquid
OL	OIL
WP	Wipe
DW	Drinking Water

SOC	
VG9T	40mL Na Thio amber vial
DG9A	40mL Ascorbic acid/ maleic Acid vials
DG9Y	Citrate/Na Thiosulfate 40mL
DG6T	Na Thiosulfate 60mL vial
DG6M	MonoClActetic/Na Thio 60mL
AG3U	250mL unpres amber glass
AG3T	Na Thiosulfate 250mL bottle
BP1B	Na Thiosulfate Amber bottle
AG1T	Na Thiosulfate 1L Amber
AG1A	525.3 Chemical Blend

Sender Initials _____

Additional Comments

Serial_No:08092317:40

DC# Title: ENV-FRM-MELV-0024 v4_SCUR
Effective Date: 5/23/2023

WO# : 70264104
PM: WB Due Date: 08/01/23
CLIENT: ALPHA

Client Name: ALPHA Project

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Commercial ☐ Pace ☐ Other

Tracking #:

Custody Seal on Cooler/Box Present: ☐ Yes ☑ No Seals intact: ☑ Yes ☐ No Temperature Blank Present: ☑ Yes ☐ No
Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ Ziploc ☐ None ☐ Other Type of Ice: Wet Blue None

Thermometer Used: TH188 Correction Factor: -0.3 ☐ Samples on ice, cooling process has begun
Cooler Temperature(°C): 3.6 Cooler Temperature Corrected(°C): 3.3 Date/Time 5035A kits placed in freezer
Temp should be above freezing to 6.0°C

USDA Regulated Soil (☐ N/A, water sample)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check map)? ☐ Yes ☐ No
Did samples orignate from a foreign source including Hawaii and Puerto Rico)? ☐ Yes ☐ No
If Yes to either question, fill out a Regulated Soil Checklist (ENV-FRM-MELV-076) and include with SCUR/COC paperwork.

Date and Initials of person examining contents: SH 7/21/23

				COMMENTS:
Chain of Custody Present:	☑Yes	☐No		1.
Chain of Custody Filled Out:	☑Yes	☐No		2.
Chain of Custody Relinquished:	☑Yes	☐No		3.
Sampler Name & Signature on COC:	☐Yes	☐No	☐N/A	4.
Samples Arrived within Hold Time:	☑Yes	☐No		5.
Short Hold Time Analysis (<72hr):	☐Yes	☑No		6.
Rush Turn Around Time Requested	☐Yes	☑No		7.
Sufficient Volume: (Triple volume provided for MS/MSD)	☑Yes	☐No		8.
Correct Containers Used:	☑Yes	☐No		9.
-Pace Containers Used:	☑Yes	☐No		
Containers Intact:	☑Yes	☐No		10.
Filtered volume received for Dissolved tests	☐Yes	☐No	☑N/A	11. if sediment is visible in the dissolved container.
Sample Labels match COC: -Includes date/time/ID/Analysis	☑Yes	☐No		12.
	Matrix:	SL	WT OIL OTHER	

Date/Initials of person checking preservation: SH 7/21/23

All containers needing preservation have been checked.	☑Yes	☐No	☐N/A	13. O_3 ☐ H_2SO_4 ☐ NaOH ☐ HCl
pH paper Lot # 10BDH0431				Samp #
All containers needing preservation are found to be in compliance with method recommendation? (HNO_3, H_2SO_4, HCl, NaOH>9 Sulfide, NAOH>12 Cyanide)	☑Yes	☐No	☐N/A	Initial when: / Lot # of added preservative / Date/Time preservative added:
Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water).				
Per Method, VOA pH is checked after analysis			☐N/A	14.
Samples checked for dechlorination:	☐Yes	☐No		Positive Chlorine? Y N
KI starch test strips Lot #				
Residual chlorine strips Lot #			☐N/A	15.
SM 4500 CN samples checked for sul	☐Yes	☐No		Pos...? Y N
Lead Acetate Strips Lot #			☐N/A	16.
Headspace in VOA Vials (>6mm):	☐Yes	☐No	☐N/A	17.
Trip Blank Present:	☐Yes	☐No	☐N/A	
Trip Blank Custody Seals Present	☐Yes	☐No		

Field ...? Y / N

Client Notification/ Resolution:
Person Contacted:
Comments/ Resolution:

* PM (Project Manager) review is documented electronically in LIMS.

ANALYTICAL REPORT

Lab Number:	L2341781
Client:	Stantec, Inc. 1060 Andrew Drive Suite 140 West Chester, PA 19380
ATTN:	Andrew Klingbeil
Phone:	(610) 840-2525
Project Name:	PESRM UDEX RELEASE
Project Number:	213403039
Report Date:	08/18/23

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341781
Report Date: 08/18/23

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2341781-01	TRIP BLANK	WATER	FORMER PHL REFINERY	07/20/23 00:00	07/20/23
L2341781-02	S-509_20230720	WATER	FORMER PHL REFINERY	07/20/23 09:35	07/20/23
L2341781-03	S-438_20230720	WATER	FORMER PHL REFINERY	07/20/23 09:35	07/20/23
L2341781-04	S-485_20230720	WATER	FORMER PHL REFINERY	07/20/23 12:25	07/20/23
L2341781-05	S-508_20230720	WATER	FORMER PHL REFINERY	07/20/23 11:50	07/20/23
L2341781-06	BF-103R_20230720	WATER	FORMER PHL REFINERY	07/20/23 13:15	07/20/23
L2341781-07	S-437_20230720	WATER	FORMER PHL REFINERY	07/20/23 12:00	07/20/23
L2341781-08	S-439_20230720	WATER	FORMER PHL REFINERY	07/20/23 14:20	07/20/23

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2341781
Project Number:	213403039	**Report Date:**	08/18/23

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2341781
Project Number:	213403039	**Report Date:**	08/18/23

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

The analysis of Sulfide was subcontracted. A copy of the laboratory report is included as an addendum. Please note: This data is only available in PDF format and is not available on Data Merger.

Sample Receipt

L2341781-03: The container for Nitrate Nitrogen, IC - EPA 300.0 (ug/L), Chloride by IC - EPA 300.0 (ug/L), and Sulfate, IC - EPA 300.0 (ug/L) was received damaged; however, there was adequate sample remaining to perform the requested analyses.

L2341781-04: Two of the containers for TPH by GC-FID Quantitation Only-Extended Ranges to C44 were received damaged; however, there was adequate sample remaining to perform the requested analysis.

L2341781-05: The sample identified as "S-508_20230720" on the chain of custody was identified as "S-509_20230720" on the container label. At the client's request, the sample is reported as "S-508_20230720".

L2341781-07: The Client ID was changed at the client's request.

Dissolved Gases

L2341781-03 and -04: The samples were collected in pre-preserved vials; however, the pH of the sample was determined to be greater than two.

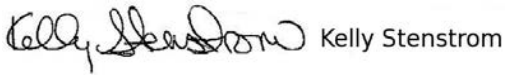
Volatile Organics by SIM

L2341781-03D, -04D, -06D, -07D, and -08D: The sample has elevated detection limits due to the dilution required by the elevated concentrations of non-target compounds in the sample.

Anions by Ion Chromatography

WG1806293: A Laboratory Duplicate was not performed due to a laboratory oversight.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:  Kelly Stenstrom

Title: Technical Director/Representative Date: 08/18/23

ORGANICS

VOLATILES

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-01 Date Collected: 07/20/23 00:00

Client ID: TRIP BLANK Date Received: 07/20/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Matrix: Water

Analytical Method: 1,8260D

Analytical Date: 07/31/23 11:36

Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	5.0	0.24	1
Chloromethane	ND		ug/l	2.5	0.20	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Bromomethane	ND		ug/l	1.0	0.26	1
Chloroethane	ND		ug/l	1.0	0.13	1
Trichlorofluoromethane	ND		ug/l	2.5	0.16	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
Carbon disulfide	ND		ug/l	5.0	0.30	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15	1
Methylene chloride	ND		ug/l	2.5	0.68	1
Acetone	ND		ug/l	5.0	1.5	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16	1
Methyl Acetate	ND		ug/l	2.0	0.23	1
Methyl tert butyl ether	ND		ug/l	1.0	0.17	1
1,1-Dichloroethane	ND		ug/l	0.75	0.21	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16	1
Cyclohexane	ND		ug/l	10	0.27	1
Bromochloromethane	ND		ug/l	2.5	0.15	1
Chloroform	ND		ug/l	0.75	0.22	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16	1
2-Butanone	ND		ug/l	5.0	1.9	1
Benzene	ND		ug/l	0.50	0.16	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
Methyl cyclohexane	ND		ug/l	10	0.40	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-01 Date Collected: 07/20/23 00:00

Client ID: TRIP BLANK Date Received: 07/20/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	0.50	0.19	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
Toluene	ND		ug/l	0.75	0.20	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,2-Dibromoethane	ND		ug/l	2.0	0.19	1
2-Hexanone	ND		ug/l	5.0	0.52	1
Chlorobenzene	ND		ug/l	0.50	0.18	1
Ethylbenzene	ND		ug/l	0.50	0.17	1
p/m-Xylene	ND		ug/l	1.0	0.33	1
o-Xylene	ND		ug/l	1.0	0.39	1
Xylenes, Total	ND		ug/l	1.0	0.33	1
Styrene	ND		ug/l	1.0	0.36	1
Bromoform	ND		ug/l	2.0	0.25	1
Isopropylbenzene	ND		ug/l	0.50	0.19	1
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	102		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	88		70-130
Dibromofluoromethane	108		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-01
Client ID: TRIP BLANK
Sample Location: FORMER PHL REFINERY
Date Collected: 07/20/23 00:00
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/31/23 11:36
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	1.1	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	103		70-130
4-Bromofluorobenzene	86		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-02 Date Collected: 07/20/23 09:35
Client ID: S-509_20230720 Date Received: 07/20/23
Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/31/23 16:09
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	5.0	0.24	1
Chloromethane	ND		ug/l	2.5	0.20	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Bromomethane	ND		ug/l	1.0	0.26	1
Chloroethane	ND		ug/l	1.0	0.13	1
Trichlorofluoromethane	ND		ug/l	2.5	0.16	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
Carbon disulfide	ND		ug/l	5.0	0.30	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15	1
Methylene chloride	ND		ug/l	2.5	0.68	1
Acetone	ND		ug/l	5.0	1.5	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16	1
Methyl Acetate	ND		ug/l	2.0	0.23	1
Methyl tert butyl ether	ND		ug/l	1.0	0.17	1
1,1-Dichloroethane	ND		ug/l	0.75	0.21	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16	1
Cyclohexane	ND		ug/l	10	0.27	1
Bromochloromethane	ND		ug/l	2.5	0.15	1
Chloroform	ND		ug/l	0.75	0.22	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16	1
2-Butanone	ND		ug/l	5.0	1.9	1
Benzene	2.8		ug/l	0.50	0.16	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
Methyl cyclohexane	ND		ug/l	10	0.40	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-02 Date Collected: 07/20/23 09:35

Client ID: S-509_20230720 Date Received: 07/20/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	0.50	0.19	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
Toluene	0.36	J	ug/l	0.75	0.20	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,2-Dibromoethane	ND		ug/l	2.0	0.19	1
2-Hexanone	ND		ug/l	5.0	0.52	1
Chlorobenzene	ND		ug/l	0.50	0.18	1
Ethylbenzene	ND		ug/l	0.50	0.17	1
p/m-Xylene	ND		ug/l	1.0	0.33	1
o-Xylene	ND		ug/l	1.0	0.39	1
Xylenes, Total	ND		ug/l	1.0	0.33	1
Styrene	ND		ug/l	1.0	0.36	1
Bromoform	ND		ug/l	2.0	0.25	1
Isopropylbenzene	ND		ug/l	0.50	0.19	1
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	106		70-130
Toluene-d8	95		70-130
4-Bromofluorobenzene	90		70-130
Dibromofluoromethane	109		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-02
Client ID: S-509_20230720
Sample Location: FORMER PHL REFINERY
Date Collected: 07/20/23 09:35
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/31/23 16:09
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	1.1	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	106		70-130
4-Bromofluorobenzene	86		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-02
Client ID: S-509_20230720
Sample Location: FORMER PHL REFINERY
Date Collected: 07/20/23 09:35
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/27/23 12:50
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	22.5		ug/l	2.00	2.00	1	A
Ethene	ND		ug/l	0.500	0.500	1	A
Ethane	1.32		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-02 D
Client ID: S-509_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 09:35
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/24/23 10:40
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	122		mg/l	6.00	6.00	2

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-03
Client ID: S-438_20230720
Sample Location: FORMER PHL REFINERY
Date Collected: 07/20/23 09:35
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/27/23 13:09
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	6330		ug/l	2.00	2.00	1	A
Ethene	ND		ug/l	0.500	0.500	1	A
Ethane	ND		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-03 D2
Client ID: S-438_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 09:35
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 08/01/23 07:37
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Benzene	230000		ug/l	1000	320	2000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	103		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	88		70-130
Dibromofluoromethane	103		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-03 D
Client ID: S-438_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 09:35
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/31/23 17:04
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	1000	49.	200
Chloromethane	ND		ug/l	500	40.	200
Vinyl chloride	ND		ug/l	200	14.	200
Bromomethane	ND		ug/l	200	51.	200
Chloroethane	ND		ug/l	200	27.	200
Trichlorofluoromethane	ND		ug/l	500	32.	200
1,1-Dichloroethene	ND		ug/l	100	34.	200
Carbon disulfide	ND		ug/l	1000	60.	200
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	500	30.	200
Methylene chloride	ND		ug/l	500	140	200
Acetone	ND		ug/l	1000	290	200
trans-1,2-Dichloroethene	ND		ug/l	150	33.	200
Methyl Acetate	2700		ug/l	400	47.	200
Methyl tert butyl ether	ND		ug/l	200	33.	200
1,1-Dichloroethane	ND		ug/l	150	42.	200
cis-1,2-Dichloroethene	ND		ug/l	100	37.	200
1,2-Dichloroethene, Total	ND		ug/l	100	33.	200
Cyclohexane	590	J	ug/l	2000	54.	200
Bromochloromethane	ND		ug/l	500	30.	200
Chloroform	ND		ug/l	150	44.	200
Carbon tetrachloride	ND		ug/l	100	27.	200
1,1,1-Trichloroethane	ND		ug/l	100	32.	200
2-Butanone	ND		ug/l	1000	390	200
Benzene	210000	E	ug/l	100	32.	200
1,2-Dichloroethane	ND		ug/l	100	26.	200
Methyl cyclohexane	160	J	ug/l	2000	79.	200
Trichloroethene	ND		ug/l	100	35.	200
1,2-Dichloropropane	ND		ug/l	200	27.	200

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-03 D Date Collected: 07/20/23 09:35

Client ID: S-438_20230720 Date Received: 07/20/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	100	38.	200
cis-1,3-Dichloropropene	ND		ug/l	100	29.	200
Toluene	23000		ug/l	150	41.	200
Tetrachloroethene	ND		ug/l	100	36.	200
4-Methyl-2-pentanone	ND		ug/l	1000	83.	200
trans-1,3-Dichloropropene	ND		ug/l	100	33.	200
1,3-Dichloropropene, Total	ND		ug/l	100	29.	200
1,1,2-Trichloroethane	ND		ug/l	150	29.	200
Dibromochloromethane	ND		ug/l	100	30.	200
1,2-Dibromoethane	ND		ug/l	400	39.	200
2-Hexanone	ND		ug/l	1000	100	200
Chlorobenzene	ND		ug/l	100	36.	200
Ethylbenzene	37	J	ug/l	100	33.	200
p/m-Xylene	87	J	ug/l	200	66.	200
o-Xylene	ND		ug/l	200	78.	200
Xylenes, Total	87	J	ug/l	200	66.	200
Styrene	ND		ug/l	200	72.	200
Bromoform	ND		ug/l	400	50.	200
Isopropylbenzene	40	J	ug/l	100	37.	200
1,3-Dichlorobenzene	ND		ug/l	500	37.	200
1,4-Dichlorobenzene	ND		ug/l	500	37.	200
1,2-Dichlorobenzene	ND		ug/l	500	37.	200
1,2-Dibromo-3-chloropropane	ND		ug/l	500	71.	200
1,2,4-Trichlorobenzene	ND		ug/l	500	44.	200
1,2,3-Trichlorobenzene	ND		ug/l	500	47.	200

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	97		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	91		70-130
Dibromofluoromethane	94		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-03 D
Client ID: S-438_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 09:35
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/31/23 17:04
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	600	210	200
1,1,2,2-Tetrachloroethane	ND		ug/l	10.0	1.14	200

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	93		70-130
4-Bromofluorobenzene	88		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-03 D
Client ID: S-438_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 09:35
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/24/23 10:57
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	30.3		mg/l	6.00	6.00	2

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-04
Client ID: S-485_20230720
Sample Location: FORMER PHL REFINERY
Date Collected: 07/20/23 12:25
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/27/23 14:35
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	2.84		ug/l	2.00	2.00	1	A
Ethene	ND		ug/l	0.500	0.500	1	A
Ethane	ND		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-04 D
Client ID: S-485_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 12:25
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 08/01/23 08:04
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	25	1.2	5
Chloromethane	ND		ug/l	12	1.0	5
Vinyl chloride	ND		ug/l	5.0	0.36	5
Bromomethane	ND		ug/l	5.0	1.3	5
Chloroethane	ND		ug/l	5.0	0.67	5
Trichlorofluoromethane	ND		ug/l	12	0.80	5
1,1-Dichloroethene	ND		ug/l	2.5	0.84	5
Carbon disulfide	ND		ug/l	25	1.5	5
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	12	0.74	5
Methylene chloride	ND		ug/l	12	3.4	5
Acetone	ND		ug/l	25	7.3	5
trans-1,2-Dichloroethene	ND		ug/l	3.8	0.82	5
Methyl Acetate	ND		ug/l	10	1.2	5
Methyl tert butyl ether	ND		ug/l	5.0	0.83	5
1,1-Dichloroethane	ND		ug/l	3.8	1.0	5
cis-1,2-Dichloroethene	ND		ug/l	2.5	0.94	5
1,2-Dichloroethene, Total	ND		ug/l	2.5	0.82	5
Cyclohexane	150		ug/l	50	1.4	5
Bromochloromethane	ND		ug/l	12	0.76	5
Chloroform	ND		ug/l	3.8	1.1	5
Carbon tetrachloride	ND		ug/l	2.5	0.67	5
1,1,1-Trichloroethane	ND		ug/l	2.5	0.79	5
2-Butanone	ND		ug/l	25	9.7	5
Benzene	400		ug/l	2.5	0.80	5
1,2-Dichloroethane	ND		ug/l	2.5	0.66	5
Methyl cyclohexane	62		ug/l	50	2.0	5
Trichloroethene	ND		ug/l	2.5	0.88	5
1,2-Dichloropropane	ND		ug/l	5.0	0.68	5

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-04 D Date Collected: 07/20/23 12:25

Client ID: S-485_20230720 Date Received: 07/20/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	2.5	0.96	5
cis-1,3-Dichloropropene	ND		ug/l	2.5	0.72	5
Toluene	810		ug/l	3.8	1.0	5
Tetrachloroethene	ND		ug/l	2.5	0.90	5
4-Methyl-2-pentanone	ND		ug/l	25	2.1	5
trans-1,3-Dichloropropene	ND		ug/l	2.5	0.82	5
1,3-Dichloropropene, Total	ND		ug/l	2.5	0.72	5
1,1,2-Trichloroethane	ND		ug/l	3.8	0.72	5
Dibromochloromethane	ND		ug/l	2.5	0.74	5
1,2-Dibromoethane	ND		ug/l	10	0.96	5
2-Hexanone	3.4	J	ug/l	25	2.6	5
Chlorobenzene	ND		ug/l	2.5	0.89	5
Ethylbenzene	2.1	J	ug/l	2.5	0.84	5
p/m-Xylene	8.8		ug/l	5.0	1.7	5
o-Xylene	ND		ug/l	5.0	2.0	5
Xylenes, Total	8.8		ug/l	5.0	1.7	5
Styrene	ND		ug/l	5.0	1.8	5
Bromoform	ND		ug/l	10	1.2	5
Isopropylbenzene	ND		ug/l	2.5	0.94	5
1,3-Dichlorobenzene	ND		ug/l	12	0.93	5
1,4-Dichlorobenzene	ND		ug/l	12	0.94	5
1,2-Dichlorobenzene	ND		ug/l	12	0.92	5
1,2-Dibromo-3-chloropropane	ND		ug/l	12	1.8	5
1,2,4-Trichlorobenzene	ND		ug/l	12	1.1	5
1,2,3-Trichlorobenzene	ND		ug/l	12	1.2	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	99		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	88		70-130
Dibromofluoromethane	93		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-04 D
Client ID: S-485_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 12:25
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 08/01/23 08:04
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	15	5.4	5
1,1,2,2-Tetrachloroethane	ND		ug/l	0.250	0.029	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	96		70-130
4-Bromofluorobenzene	87		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-04 D
Client ID: S-485_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 12:25
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/24/23 11:15
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	29.4		mg/l	6.00	6.00	2

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-05 Date Collected: 07/20/23 11:50
Client ID: S-508_20230720 Date Received: 07/20/23
Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/31/23 16:37
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	5.0	0.24	1
Chloromethane	ND		ug/l	2.5	0.20	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Bromomethane	ND		ug/l	1.0	0.26	1
Chloroethane	ND		ug/l	1.0	0.13	1
Trichlorofluoromethane	ND		ug/l	2.5	0.16	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
Carbon disulfide	ND		ug/l	5.0	0.30	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15	1
Methylene chloride	ND		ug/l	2.5	0.68	1
Acetone	ND		ug/l	5.0	1.5	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16	1
Methyl Acetate	ND		ug/l	2.0	0.23	1
Methyl tert butyl ether	1.4		ug/l	1.0	0.17	1
1,1-Dichloroethane	0.25	J	ug/l	0.75	0.21	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16	1
Cyclohexane	ND		ug/l	10	0.27	1
Bromochloromethane	ND		ug/l	2.5	0.15	1
Chloroform	ND		ug/l	0.75	0.22	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16	1
2-Butanone	1.9	J	ug/l	5.0	1.9	1
Benzene	1.0		ug/l	0.50	0.16	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
Methyl cyclohexane	ND		ug/l	10	0.40	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-05 Date Collected: 07/20/23 11:50

Client ID: S-508_20230720 Date Received: 07/20/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	0.50	0.19	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
Toluene	ND		ug/l	0.75	0.20	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,2-Dibromoethane	ND		ug/l	2.0	0.19	1
2-Hexanone	ND		ug/l	5.0	0.52	1
Chlorobenzene	ND		ug/l	0.50	0.18	1
Ethylbenzene	ND		ug/l	0.50	0.17	1
p/m-Xylene	ND		ug/l	1.0	0.33	1
o-Xylene	ND		ug/l	1.0	0.39	1
Xylenes, Total	ND		ug/l	1.0	0.33	1
Styrene	ND		ug/l	1.0	0.36	1
Bromoform	ND		ug/l	2.0	0.25	1
Isopropylbenzene	ND		ug/l	0.50	0.19	1
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	107		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	88		70-130
Dibromofluoromethane	113		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-05
Client ID: S-508_20230720
Sample Location: FORMER PHL REFINERY
Date Collected: 07/20/23 11:50
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/31/23 16:37
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	1.8	J	ug/l	3.0	1.1	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	105		70-130
4-Bromofluorobenzene	84		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-05
Client ID: S-508_20230720
Sample Location: FORMER PHL REFINERY
Date Collected: 07/20/23 11:50
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/27/23 14:59
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	25.8		ug/l	2.00	2.00	1	A
Ethene	0.847		ug/l	0.500	0.500	1	A
Ethane	1.50		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-05 D
Client ID: S-508_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 11:50
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/24/23 11:33
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	115		mg/l	6.00	6.00	2

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-06
Client ID: BF-103R_20230720
Sample Location: FORMER PHL REFINERY
Date Collected: 07/20/23 13:15
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/27/23 15:45
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	133		ug/l	2.00	2.00	1	A
Ethene	ND		ug/l	0.500	0.500	1	A
Ethane	ND		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-06 D
Client ID: BF-103R_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 13:15
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/31/23 17:59
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	250	12.	50
Chloromethane	ND		ug/l	120	10.	50
Vinyl chloride	ND		ug/l	50	3.6	50
Bromomethane	ND		ug/l	50	13.	50
Chloroethane	ND		ug/l	50	6.7	50
Trichlorofluoromethane	ND		ug/l	120	8.0	50
1,1-Dichloroethene	ND		ug/l	25	8.4	50
Carbon disulfide	ND		ug/l	250	15.	50
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	120	7.4	50
Methylene chloride	ND		ug/l	120	34.	50
Acetone	ND		ug/l	250	73.	50
trans-1,2-Dichloroethene	ND		ug/l	38	8.2	50
Methyl Acetate	ND		ug/l	100	12.	50
Methyl tert butyl ether	ND		ug/l	50	8.3	50
1,1-Dichloroethane	ND		ug/l	38	10.	50
cis-1,2-Dichloroethene	ND		ug/l	25	9.4	50
1,2-Dichloroethene, Total	ND		ug/l	25	8.2	50
Cyclohexane	77	J	ug/l	500	14.	50
Bromochloromethane	ND		ug/l	120	7.6	50
Chloroform	ND		ug/l	38	11.	50
Carbon tetrachloride	ND		ug/l	25	6.7	50
1,1,1-Trichloroethane	ND		ug/l	25	7.9	50
2-Butanone	ND		ug/l	250	97.	50
Benzene	8000		ug/l	25	8.0	50
1,2-Dichloroethane	ND		ug/l	25	6.6	50
Methyl cyclohexane	30	J	ug/l	500	20.	50
Trichloroethene	ND		ug/l	25	8.8	50
1,2-Dichloropropane	ND		ug/l	50	6.8	50

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-06 D Date Collected: 07/20/23 13:15

Client ID: BF-103R_20230720 Date Received: 07/20/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	25	9.6	50
cis-1,3-Dichloropropene	ND		ug/l	25	7.2	50
Toluene	2600		ug/l	38	10.	50
Tetrachloroethene	ND		ug/l	25	9.0	50
4-Methyl-2-pentanone	ND		ug/l	250	21.	50
trans-1,3-Dichloropropene	ND		ug/l	25	8.2	50
1,3-Dichloropropene, Total	ND		ug/l	25	7.2	50
1,1,2-Trichloroethane	ND		ug/l	38	7.2	50
Dibromochloromethane	ND		ug/l	25	7.4	50
1,2-Dibromoethane	ND		ug/l	100	9.6	50
2-Hexanone	ND		ug/l	250	26.	50
Chlorobenzene	ND		ug/l	25	8.9	50
Ethylbenzene	11	J	ug/l	25	8.4	50
p/m-Xylene	35	J	ug/l	50	17.	50
o-Xylene	ND		ug/l	50	20.	50
Xylenes, Total	35	J	ug/l	50	17.	50
Styrene	ND		ug/l	50	18.	50
Bromoform	ND		ug/l	100	12.	50
Isopropylbenzene	ND		ug/l	25	9.4	50
1,3-Dichlorobenzene	ND		ug/l	120	9.3	50
1,4-Dichlorobenzene	ND		ug/l	120	9.4	50
1,2-Dichlorobenzene	ND		ug/l	120	9.2	50
1,2-Dibromo-3-chloropropane	ND		ug/l	120	18.	50
1,2,4-Trichlorobenzene	ND		ug/l	120	11.	50
1,2,3-Trichlorobenzene	ND		ug/l	120	12.	50

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	100		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	86		70-130
Dibromofluoromethane	101		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-06 D
Client ID: BF-103R_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 13:15
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/31/23 17:59
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	150	54.	50
1,1,2,2-Tetrachloroethane	ND		ug/l	2.50	0.285	50

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	97		70-130
4-Bromofluorobenzene	86		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-06 D
Client ID: BF-103R_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 13:15
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/24/23 11:51
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	62.6		mg/l	6.00	6.00	2

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-07 Date Collected: 07/20/23 12:00
Client ID: S-437_20230720 Date Received: 07/20/23
Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/27/23 16:08
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	955		ug/l	2.00	2.00	1	A
Ethene	ND		ug/l	0.500	0.500	1	A
Ethane	ND		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-07 D
Client ID: S-437_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 12:00
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/31/23 18:26
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	10000	490	2000
Chloromethane	ND		ug/l	5000	400	2000
Vinyl chloride	ND		ug/l	2000	140	2000
Bromomethane	ND		ug/l	2000	510	2000
Chloroethane	ND		ug/l	2000	270	2000
Trichlorofluoromethane	ND		ug/l	5000	320	2000
1,1-Dichloroethene	ND		ug/l	1000	340	2000
Carbon disulfide	ND		ug/l	10000	600	2000
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	5000	300	2000
Methylene chloride	ND		ug/l	5000	1400	2000
Acetone	ND		ug/l	10000	2900	2000
trans-1,2-Dichloroethene	ND		ug/l	1500	330	2000
Methyl Acetate	ND		ug/l	4000	470	2000
Methyl tert butyl ether	ND		ug/l	2000	330	2000
1,1-Dichloroethane	ND		ug/l	1500	420	2000
cis-1,2-Dichloroethene	ND		ug/l	1000	370	2000
1,2-Dichloroethene, Total	ND		ug/l	1000	330	2000
Cyclohexane	ND		ug/l	20000	540	2000
Bromochloromethane	ND		ug/l	5000	300	2000
Chloroform	ND		ug/l	1500	440	2000
Carbon tetrachloride	ND		ug/l	1000	270	2000
1,1,1-Trichloroethane	ND		ug/l	1000	320	2000
2-Butanone	ND		ug/l	10000	3900	2000
Benzene	260000		ug/l	1000	320	2000
1,2-Dichloroethane	ND		ug/l	1000	260	2000
Methyl cyclohexane	ND		ug/l	20000	790	2000
Trichloroethene	ND		ug/l	1000	350	2000
1,2-Dichloropropane	ND		ug/l	2000	270	2000

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-07 D Date Collected: 07/20/23 12:00

Client ID: S-437_20230720 Date Received: 07/20/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	1000	380	2000
cis-1,3-Dichloropropene	ND		ug/l	1000	290	2000
Toluene	64000		ug/l	1500	410	2000
Tetrachloroethene	ND		ug/l	1000	360	2000
4-Methyl-2-pentanone	ND		ug/l	10000	830	2000
trans-1,3-Dichloropropene	ND		ug/l	1000	330	2000
1,3-Dichloropropene, Total	ND		ug/l	1000	290	2000
1,1,2-Trichloroethane	ND		ug/l	1500	290	2000
Dibromochloromethane	ND		ug/l	1000	300	2000
1,2-Dibromoethane	ND		ug/l	4000	390	2000
2-Hexanone	ND		ug/l	10000	1000	2000
Chlorobenzene	ND		ug/l	1000	360	2000
Ethylbenzene	ND		ug/l	1000	330	2000
p/m-Xylene	ND		ug/l	2000	660	2000
o-Xylene	ND		ug/l	2000	780	2000
Xylenes, Total	ND		ug/l	2000	660	2000
Styrene	ND		ug/l	2000	720	2000
Bromoform	ND		ug/l	4000	500	2000
Isopropylbenzene	ND		ug/l	1000	370	2000
1,3-Dichlorobenzene	ND		ug/l	5000	370	2000
1,4-Dichlorobenzene	ND		ug/l	5000	370	2000
1,2-Dichlorobenzene	ND		ug/l	5000	370	2000
1,2-Dibromo-3-chloropropane	ND		ug/l	5000	710	2000
1,2,4-Trichlorobenzene	ND		ug/l	5000	440	2000
1,2,3-Trichlorobenzene	ND		ug/l	5000	470	2000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	103		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	87		70-130
Dibromofluoromethane	104		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-07 D
Client ID: S-437_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 12:00
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/31/23 18:26
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	6000	2100	2000
1,1,2,2-Tetrachloroethane	ND		ug/l	100	11.4	2000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	99		70-130
4-Bromofluorobenzene	85		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-07 D
Client ID: S-437_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 12:00
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/24/23 13:22
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	45.9		mg/l	6.00	6.00	2

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-08
Client ID: S-439_20230720
Sample Location: FORMER PHL REFINERY
Date Collected: 07/20/23 14:20
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/27/23 16:55
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	12700		ug/l	2.00	2.00	1	A
Ethene	ND		ug/l	0.500	0.500	1	A
Ethane	ND		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-08 D
Client ID: S-439_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 14:20
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 07/31/23 18:53
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	5000	240	1000
Chloromethane	ND		ug/l	2500	200	1000
Vinyl chloride	ND		ug/l	1000	71.	1000
Bromomethane	ND		ug/l	1000	260	1000
Chloroethane	ND		ug/l	1000	130	1000
Trichlorofluoromethane	ND		ug/l	2500	160	1000
1,1-Dichloroethene	ND		ug/l	500	170	1000
Carbon disulfide	ND		ug/l	5000	300	1000
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2500	150	1000
Methylene chloride	ND		ug/l	2500	680	1000
Acetone	ND		ug/l	5000	1500	1000
trans-1,2-Dichloroethene	ND		ug/l	750	160	1000
Methyl Acetate	ND		ug/l	2000	230	1000
Methyl tert butyl ether	ND		ug/l	1000	170	1000
1,1-Dichloroethane	ND		ug/l	750	210	1000
cis-1,2-Dichloroethene	ND		ug/l	500	190	1000
1,2-Dichloroethene, Total	ND		ug/l	500	160	1000
Cyclohexane	420	J	ug/l	10000	270	1000
Bromochloromethane	ND		ug/l	2500	150	1000
Chloroform	ND		ug/l	750	220	1000
Carbon tetrachloride	ND		ug/l	500	130	1000
1,1,1-Trichloroethane	ND		ug/l	500	160	1000
2-Butanone	ND		ug/l	5000	1900	1000
Benzene	180000		ug/l	500	160	1000
1,2-Dichloroethane	ND		ug/l	500	130	1000
Methyl cyclohexane	ND		ug/l	10000	400	1000
Trichloroethene	ND		ug/l	500	180	1000
1,2-Dichloropropane	ND		ug/l	1000	140	1000

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-08 D Date Collected: 07/20/23 14:20

Client ID: S-439_20230720 Date Received: 07/20/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	500	190	1000
cis-1,3-Dichloropropene	ND		ug/l	500	140	1000
Toluene	18000		ug/l	750	200	1000
Tetrachloroethene	ND		ug/l	500	180	1000
4-Methyl-2-pentanone	ND		ug/l	5000	420	1000
trans-1,3-Dichloropropene	ND		ug/l	500	160	1000
1,3-Dichloropropene, Total	ND		ug/l	500	140	1000
1,1,2-Trichloroethane	ND		ug/l	750	140	1000
Dibromochloromethane	ND		ug/l	500	150	1000
1,2-Dibromoethane	ND		ug/l	2000	190	1000
2-Hexanone	ND		ug/l	5000	520	1000
Chlorobenzene	ND		ug/l	500	180	1000
Ethylbenzene	ND		ug/l	500	170	1000
p/m-Xylene	ND		ug/l	1000	330	1000
o-Xylene	ND		ug/l	1000	390	1000
Xylenes, Total	ND		ug/l	1000	330	1000
Styrene	ND		ug/l	1000	360	1000
Bromoform	ND		ug/l	2000	250	1000
Isopropylbenzene	ND		ug/l	500	190	1000
1,3-Dichlorobenzene	ND		ug/l	2500	190	1000
1,4-Dichlorobenzene	ND		ug/l	2500	190	1000
1,2-Dichlorobenzene	ND		ug/l	2500	180	1000
1,2-Dibromo-3-chloropropane	ND		ug/l	2500	350	1000
1,2,4-Trichlorobenzene	ND		ug/l	2500	220	1000
1,2,3-Trichlorobenzene	ND		ug/l	2500	230	1000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	100		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	89		70-130
Dibromofluoromethane	101		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-08 D
Client ID: S-439_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 14:20
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/31/23 18:53
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3000	1100	1000
1,1,2,2-Tetrachloroethane	ND		ug/l	50.0	5.70	1000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	98		70-130
4-Bromofluorobenzene	85		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-08 D
Client ID: S-439_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 14:20
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/24/23 13:39
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	131		mg/l	6.00	6.00	2

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341781
Report Date: 08/18/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 117,-
Analytical Date: 07/24/23 08:49
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL
Dissolved Gases by GC - Mansfield Lab for sample(s): 02-08 Batch: WG1806862-3					
Carbon Dioxide	ND		mg/l	3.00	3.00

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341781
Report Date: 08/18/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 117,-
Analytical Date: 07/27/23 09:15
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	
Dissolved Gases by GC - Mansfield Lab for sample(s): 02-08 Batch: WG1808379-3						
Methane	ND		ug/l	2.00	2.00	A
Ethene	ND		ug/l	0.500	0.500	A
Ethane	ND		ug/l	0.500	0.500	A

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/31/23 11:09
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-03,05-08 Batch: WG1810160-5					
Dichlorodifluoromethane	ND		ug/l	5.0	0.24
Chloromethane	ND		ug/l	2.5	0.20
Vinyl chloride	ND		ug/l	1.0	0.07
Bromomethane	ND		ug/l	1.0	0.26
Chloroethane	ND		ug/l	1.0	0.13
Trichlorofluoromethane	ND		ug/l	2.5	0.16
1,1-Dichloroethene	ND		ug/l	0.50	0.17
Carbon disulfide	ND		ug/l	5.0	0.30
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15
Methylene chloride	ND		ug/l	2.5	0.68
Acetone	ND		ug/l	5.0	1.5
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16
Methyl Acetate	ND		ug/l	2.0	0.23
Methyl tert butyl ether	ND		ug/l	1.0	0.17
1,1-Dichloroethane	ND		ug/l	0.75	0.21
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16
Cyclohexane	ND		ug/l	10	0.27
Bromochloromethane	ND		ug/l	2.5	0.15
Chloroform	ND		ug/l	0.75	0.22
Carbon tetrachloride	ND		ug/l	0.50	0.13
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16
2-Butanone	ND		ug/l	5.0	1.9
Benzene	ND		ug/l	0.50	0.16
1,2-Dichloroethane	ND		ug/l	0.50	0.13
Methyl cyclohexane	ND		ug/l	10	0.40
Trichloroethene	ND		ug/l	0.50	0.18
1,2-Dichloropropane	ND		ug/l	1.0	0.14
Bromodichloromethane	ND		ug/l	0.50	0.19

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/31/23 11:09
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-03,05-08 Batch: WG1810160-5					
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14
Toluene	ND		ug/l	0.75	0.20
Tetrachloroethene	ND		ug/l	0.50	0.18
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14
Dibromochloromethane	ND		ug/l	0.50	0.15
1,2-Dibromoethane	ND		ug/l	2.0	0.19
2-Hexanone	ND		ug/l	5.0	0.52
Chlorobenzene	ND		ug/l	0.50	0.18
Ethylbenzene	ND		ug/l	0.50	0.17
p/m-Xylene	ND		ug/l	1.0	0.33
o-Xylene	ND		ug/l	1.0	0.39
Xylenes, Total	ND		ug/l	1.0	0.33
Styrene	ND		ug/l	1.0	0.36
Bromoform	ND		ug/l	2.0	0.25
Isopropylbenzene	ND		ug/l	0.50	0.19
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/31/23 11:09
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-03,05-08 Batch: WG1810160-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	103		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	89		70-130
Dibromofluoromethane	108		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D-SIM(M)
Analytical Date: 07/31/23 11:09
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01-03,05-08 Batch: WG1810162-5					
1,4-Dioxane	1.8	J	ug/l	3.0	1.1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	103		70-130
4-Bromofluorobenzene	87		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 08/01/23 06:42
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 03-04 Batch: WG1810258-5					
Dichlorodifluoromethane	ND		ug/l	5.0	0.24
Chloromethane	ND		ug/l	2.5	0.20
Vinyl chloride	ND		ug/l	1.0	0.07
Bromomethane	ND		ug/l	1.0	0.26
Chloroethane	ND		ug/l	1.0	0.13
Trichlorofluoromethane	ND		ug/l	2.5	0.16
1,1-Dichloroethene	ND		ug/l	0.50	0.17
Carbon disulfide	ND		ug/l	5.0	0.30
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15
Methylene chloride	ND		ug/l	2.5	0.68
Acetone	ND		ug/l	5.0	1.5
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16
Methyl Acetate	ND		ug/l	2.0	0.23
Methyl tert butyl ether	ND		ug/l	1.0	0.17
1,1-Dichloroethane	ND		ug/l	0.75	0.21
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16
Cyclohexane	ND		ug/l	10	0.27
Bromochloromethane	ND		ug/l	2.5	0.15
Chloroform	ND		ug/l	0.75	0.22
Carbon tetrachloride	ND		ug/l	0.50	0.13
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16
2-Butanone	ND		ug/l	5.0	1.9
Benzene	ND		ug/l	0.50	0.16
1,2-Dichloroethane	ND		ug/l	0.50	0.13
Methyl cyclohexane	ND		ug/l	10	0.40
Trichloroethene	ND		ug/l	0.50	0.18
1,2-Dichloropropane	ND		ug/l	1.0	0.14
Bromodichloromethane	ND		ug/l	0.50	0.19

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 08/01/23 06:42
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 03-04 Batch: WG1810258-5					
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14
Toluene	ND		ug/l	0.75	0.20
Tetrachloroethene	ND		ug/l	0.50	0.18
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14
Dibromochloromethane	ND		ug/l	0.50	0.15
1,2-Dibromoethane	ND		ug/l	2.0	0.19
2-Hexanone	ND		ug/l	5.0	0.52
Chlorobenzene	ND		ug/l	0.50	0.18
Ethylbenzene	ND		ug/l	0.50	0.17
p/m-Xylene	ND		ug/l	1.0	0.33
o-Xylene	ND		ug/l	1.0	0.39
Xylenes, Total	ND		ug/l	1.0	0.33
Styrene	ND		ug/l	1.0	0.36
Bromoform	ND		ug/l	2.0	0.25
Isopropylbenzene	ND		ug/l	0.50	0.19
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 08/01/23 06:42
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 03-04 Batch: WG1810258-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	111		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	88		70-130
Dibromofluoromethane	111		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D-SIM(M)
Analytical Date: 08/01/23 06:42
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 04 Batch: WG1810270-5					
1,4-Dioxane	ND		ug/l	3.0	1.1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	107		70-130
4-Bromofluorobenzene	86		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341781

Report Date: 08/18/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Dissolved Gases by GC - Mansfield Lab Associated sample(s): 02-08 Batch: WG1806862-2								
Carbon Dioxide	95		-		80-120	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341781

Report Date: 08/18/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Dissolved Gases by GC - Mansfield Lab Associated sample(s): 02-08 Batch: WG1808379-2									
Methane	108		-		80-120	-		25	A
Ethene	102		-		80-120	-		25	A
Ethane	102		-		80-120	-		25	A

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341781
Report Date: 08/18/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-03,05-08 Batch: WG1810160-3 WG1810160-4								
Dichlorodifluoromethane	140		130		36-147	7		20
Chloromethane	120		120		64-130	0		20
Vinyl chloride	120		120		55-140	0		20
Bromomethane	110		70		39-139	**44**	Q	20
Chloroethane	95		**50**	Q	55-138	**62**	Q	20
Trichlorofluoromethane	100		83		62-150	19		20
1,1-Dichloroethene	120		83		61-145	**36**	Q	20
Carbon disulfide	120		75		51-130	**46**	Q	20
1,1,2-Trichloro-1,2,2-Trifluoroethane	120		90		70-130	**29**	Q	20
Methylene chloride	110		110		70-130	0		20
Acetone	120		120		58-148	0		20
trans-1,2-Dichloroethene	110		110		70-130	0		20
Methyl Acetate	120		130		70-130	8		20
Methyl tert butyl ether	120		120		63-130	0		20
1,1-Dichloroethane	120		120		70-130	0		20
cis-1,2-Dichloroethene	120		110		70-130	9		20
Cyclohexane	110		100		70-130	10		20
Bromochloromethane	110		110		70-130	0		20
Chloroform	110		110		70-130	0		20
Carbon tetrachloride	110		110		63-132	0		20
1,1,1-Trichloroethane	120		120		67-130	0		20
2-Butanone	110		120		63-138	9		20
Benzene	120		110		70-130	9		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341781
Report Date: 08/18/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-03,05-08 Batch: WG1810160-3 WG1810160-4								
1,2-Dichloroethane	120		120		70-130	0		20
Methyl cyclohexane	110		100		70-130	10		20
Trichloroethene	110		110		70-130	0		20
1,2-Dichloropropane	110		110		70-130	0		20
Bromodichloromethane	110		110		67-130	0		20
cis-1,3-Dichloropropene	110		100		70-130	10		20
Toluene	110		110		70-130	0		20
Tetrachloroethene	120		120		70-130	0		20
4-Methyl-2-pentanone	92		92		59-130	0		20
trans-1,3-Dichloropropene	110		110		70-130	0		20
1,1,2-Trichloroethane	110		110		70-130	0		20
Dibromochloromethane	110		110		63-130	0		20
1,2-Dibromoethane	110		110		70-130	0		20
2-Hexanone	98		96		57-130	2		20
Chlorobenzene	110		100		75-130	10		20
Ethylbenzene	110		110		70-130	0		20
p/m-Xylene	110		105		70-130	5		20
o-Xylene	110		105		70-130	5		20
Styrene	105		105		70-130	0		20
Bromoform	100		100		54-136	0		20
Isopropylbenzene	110		100		70-130	10		20
1,3-Dichlorobenzene	110		110		70-130	0		20
1,4-Dichlorobenzene	110		110		70-130	0		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341781

Report Date: 08/18/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-03,05-08 Batch: WG1810160-3 WG1810160-4								
1,2-Dichlorobenzene	110		110		70-130	0		20
1,2-Dibromo-3-chloropropane	110		110		41-144	0		20
1,2,4-Trichlorobenzene	110		110		70-130	0		20
1,2,3-Trichlorobenzene	120		120		70-130	0		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	97		98		70-130
Toluene-d8	96		98		70-130
4-Bromofluorobenzene	89		91		70-130
Dibromofluoromethane	95		99		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341781

Report Date: 08/18/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-03,05-08 Batch: WG1810162-3 WG1810162-4								
1,4-Dioxane	110		130		70-130	17		25
1,1,2,2-Tetrachloroethane	125		122		70-130	2		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	104		103		70-130
4-Bromofluorobenzene	89		87		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341781
Report Date: 08/18/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 03-04 Batch: WG1810258-3 WG1810258-4								
Dichlorodifluoromethane	130		130		36-147	0		20
Chloromethane	120		120		64-130	0		20
Vinyl chloride	120		120		55-140	0		20
Bromomethane	93		100		39-139	7		20
Chloroethane	70		71		55-138	1		20
Trichlorofluoromethane	110		110		62-150	0		20
1,1-Dichloroethene	110		110		61-145	0		20
Carbon disulfide	120		110		51-130	9		20
1,1,2-Trichloro-1,2,2-Trifluoroethane	120		120		70-130	0		20
Methylene chloride	110		100		70-130	10		20
Acetone	130		130		58-148	0		20
trans-1,2-Dichloroethene	110		110		70-130	0		20
Methyl Acetate	120		120		70-130	0		20
Methyl tert butyl ether	120		120		63-130	0		20
1,1-Dichloroethane	120		110		70-130	9		20
cis-1,2-Dichloroethene	110		110		70-130	0		20
Cyclohexane	110		110		70-130	0		20
Bromochloromethane	110		110		70-130	0		20
Chloroform	110		110		70-130	0		20
Carbon tetrachloride	110		110		63-132	0		20
1,1,1-Trichloroethane	120		120		67-130	0		20
2-Butanone	110		110		63-138	0		20
Benzene	110		110		70-130	0		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341781
Report Date: 08/18/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 03-04 Batch: WG1810258-3 WG1810258-4								
1,2-Dichloroethane	120		120		70-130	0		20
Methyl cyclohexane	110		110		70-130	0		20
Trichloroethene	110		110		70-130	0		20
1,2-Dichloropropane	110		100		70-130	10		20
Bromodichloromethane	110		100		67-130	10		20
cis-1,3-Dichloropropene	110		100		70-130	10		20
Toluene	110		110		70-130	0		20
Tetrachloroethene	120		120		70-130	0		20
4-Methyl-2-pentanone	86		90		59-130	5		20
trans-1,3-Dichloropropene	110		100		70-130	10		20
1,1,2-Trichloroethane	110		110		70-130	0		20
Dibromochloromethane	110		110		63-130	0		20
1,2-Dibromoethane	110		110		70-130	0		20
2-Hexanone	98		96		57-130	2		20
Chlorobenzene	100		100		75-130	0		20
Ethylbenzene	110		100		70-130	10		20
p/m-Xylene	105		105		70-130	0		20
o-Xylene	105		100		70-130	5		20
Styrene	105		100		70-130	5		20
Bromoform	96		92		54-136	4		20
Isopropylbenzene	100		97		70-130	3		20
1,3-Dichlorobenzene	100		100		70-130	0		20
1,4-Dichlorobenzene	100		100		70-130	0		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341781

Report Date: 08/18/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 03-04 Batch: WG1810258-3 WG1810258-4								
1,2-Dichlorobenzene	100		100		70-130	0		20
1,2-Dibromo-3-chloropropane	96		94		41-144	2		20
1,2,4-Trichlorobenzene	110		110		70-130	0		20
1,2,3-Trichlorobenzene	110		110		70-130	0		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	104		98		70-130
Toluene-d8	98		98		70-130
4-Bromofluorobenzene	89		87		70-130
Dibromofluoromethane	101		101		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341781

Report Date: 08/18/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 04 Batch: WG1810270-3 WG1810270-4								
1,4-Dioxane	130		84		70-130	**43**	Q	25
1,1,2,2-Tetrachloroethane	101		107		70-130	6		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	107		107		70-130
4-Bromofluorobenzene	86		86		70-130

Matrix Spike Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341781

Report Date: 08/18/23

Parameter	*Native Sample*	*MS Added*	*MS Found*	*MS %Recovery*	*Qual*	*MSD Found*	*MSD %Recovery*	*Qual*	*Recovery Limits*	*RPD*	*Qual*	*RPD Limits*
Dissolved Gases by GC - Mansfield Lab	Associated sample(s): 02-08	QC Batch ID: WG1806862-5	QC Sample: L2341781-03	Client ID: S-438_20230720								
Carbon Dioxide	30.3	12	43.8	113		-	-		80-120	-		25

PETROLEUM HYDROCARBONS

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-02
Client ID: S-509_20230720
Sample Location: FORMER PHL REFINERY
Date Collected: 07/20/23 09:35
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/26/23 16:43
Analyst: BAD
Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	30	J	ug/l	50	3.0	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	119		70-130
4-Bromofluorobenzene	125		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-02
Client ID: S-509_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 09:35
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/27/23 22:08
Analyst: MTC

Extraction Method: EPA 3510C
Extraction Date: 07/26/23 21:46

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	210	J	ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	63		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-03
Client ID: S-438_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 09:35
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/27/23 22:43
Analyst: MTC

Extraction Method: EPA 3510C
Extraction Date: 07/26/23 21:46

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	320	J	ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	59		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-03 D
Client ID: S-438_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 09:35
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/28/23 16:29
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	230000		ug/l	25000	1500	500

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	108		70-130
4-Bromofluorobenzene	106		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-04
Client ID: S-485_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 12:25
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/28/23 00:28
Analyst: MTC

Extraction Method: EPA 3510C
Extraction Date: 07/26/23 21:46

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	190	J	ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	68		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-04 D
Client ID: S-485_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 12:25
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/26/23 17:45
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	3800		ug/l	250	15.	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	106		70-130
4-Bromofluorobenzene	117		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-05
Client ID: S-508_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 11:50
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/26/23 18:16
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	23	J	ug/l	50	3.0	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	113		70-130
4-Bromofluorobenzene	117		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-05
Client ID: S-508_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 11:50
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/27/23 23:18
Analyst: MTC

Extraction Method: EPA 3510C
Extraction Date: 07/26/23 21:46

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	160	J	ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	61		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-06
Client ID: BF-103R_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 13:15
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/27/23 23:53
Analyst: MTC

Extraction Method: EPA 3510C
Extraction Date: 07/26/23 21:46

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	476	J	ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	63		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-06 D
Client ID: BF-103R_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 13:15
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/26/23 18:47
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	13000		ug/l	2000	120	40

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	112		70-130
4-Bromofluorobenzene	116		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-07
Client ID: S-437_20230720
Sample Location: FORMER PHL REFINERY
Date Collected: 07/20/23 12:00
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/28/23 01:03
Analyst: MTC
Extraction Method: EPA 3510C
Extraction Date: 07/26/23 21:46

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	4220		ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	60		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-07 D
Client ID: S-437_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 12:00
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/26/23 19:18
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	300000		ug/l	25000	1500	500

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	113		70-130
4-Bromofluorobenzene	116		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-08 D
Client ID: S-439_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 14:20
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/26/23 19:49
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	420000		ug/l	50000	3000	1000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	113		70-130
4-Bromofluorobenzene	112		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-08 D
Client ID: S-439_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 14:20
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/28/23 17:03
Analyst: MTC

Extraction Method: EPA 3510C
Extraction Date: 07/26/23 21:46

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	38900		ug/l	2500	431.	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	79		40-140

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341781
Report Date: 08/18/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 07/27/23 16:51
Analyst: MTC

Extraction Method: EPA 3510C
Extraction Date: 07/26/23 21:46

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 02-08 Batch: WG1808209-1					
TPH (C9-C44)	151	J	ug/l	500	86.2

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	66		40-140

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341781
Report Date: 08/18/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 07/26/23 12:04
Analyst: BAD

Parameter	Result	Qualifier	Units	RL	MDL
Gasoline Range Organics - Westborough Lab for sample(s): 02,04-08 Batch: WG1808557-4					
Gasoline Range Organics	16	J	ug/l	50	3.0

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	102		70-130
4-Bromofluorobenzene	99		70-130

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341781
Report Date: 08/18/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 07/28/23 13:53
Analyst: BAD

Parameter	Result	Qualifier	Units	RL	MDL
Gasoline Range Organics - Westborough Lab for sample(s): 03 Batch: WG1809358-4					
Gasoline Range Organics	17	J	ug/l	50	3.0

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	106		70-130
4-Bromofluorobenzene	104		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341781

Report Date: 08/18/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 02-08 Batch: WG1808209-2								
TPH (C9-C44)	71		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	73				40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341781

Report Date: 08/18/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Gasoline Range Organics - Westborough Lab	Associated sample(s): 02,04-08		Batch: WG1808557-2		WG1808557-3			
Gasoline Range Organics	93		101		80-120	8		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,1,1-Trifluorotoluene	105		113		70-130
4-Bromofluorobenzene	103		111		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341781

Report Date: 08/18/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Gasoline Range Organics - Westborough Lab	Associated sample(s): 03		Batch: WG1809358-2 WG1809358-3					
Gasoline Range Organics	89		100		80-120	12		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,1,1-Trifluorotoluene	110		112		70-130
4-Bromofluorobenzene	105		112		70-130

METALS

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-02
Client ID: S-509_20230720
Sample Location: FORMER PHL REFINERY
Date Collected: 07/20/23 09:35
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	72800		ug/l	100.	35.0	1	07/25/23 15:53	08/10/23 18:55	EPA 3005A	1,6010D	MRC
Iron, Total	10100		ug/l	50.0	9.00	1	07/25/23 15:53	08/10/23 18:55	EPA 3005A	1,6010D	MRC
Magnesium, Total	47800		ug/l	100.	15.3	1	07/25/23 15:53	08/10/23 18:55	EPA 3005A	1,6010D	MRC
Potassium, Total	9990		ug/l	2500	237.	1	07/25/23 15:53	08/10/23 18:55	EPA 3005A	1,6010D	MRC
Sodium, Total	67700		ug/l	2000	120.	1	07/25/23 15:53	08/10/23 18:55	EPA 3005A	1,6010D	MRC

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-03 Date Collected: 07/20/23 09:35

Client ID: S-438_20230720 Date Received: 07/20/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	57600		ug/l	100.	35.0	1	07/25/23 15:53	08/10/23 19:07	EPA 3005A	1,6010D	MRC
Iron, Total	14200		ug/l	50.0	9.00	1	07/25/23 15:53	08/10/23 19:07	EPA 3005A	1,6010D	MRC
Magnesium, Total	7300		ug/l	100.	15.3	1	07/25/23 15:53	08/10/23 19:07	EPA 3005A	1,6010D	MRC
Potassium, Total	4020		ug/l	2500	237.	1	07/25/23 15:53	08/10/23 19:07	EPA 3005A	1,6010D	MRC
Sodium, Total	66300		ug/l	2000	120.	1	07/25/23 15:53	08/10/23 19:07	EPA 3005A	1,6010D	MRC

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-04
Client ID: S-485_20230720
Sample Location: FORMER PHL REFINERY
Date Collected: 07/20/23 12:25
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	15200		ug/l	100.	35.0	1	07/25/23 15:53	08/10/23 19:16	EPA 3005A	1,6010D	MRC
Iron, Total	353.		ug/l	50.0	9.00	1	07/25/23 15:53	08/10/23 19:16	EPA 3005A	1,6010D	MRC
Magnesium, Total	768.		ug/l	100.	15.3	1	07/25/23 15:53	08/10/23 19:16	EPA 3005A	1,6010D	MRC
Potassium, Total	5100		ug/l	2500	237.	1	07/25/23 15:53	08/10/23 19:16	EPA 3005A	1,6010D	MRC
Sodium, Total	9630		ug/l	2000	120.	1	07/25/23 15:53	08/10/23 19:16	EPA 3005A	1,6010D	MRC

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-05
Client ID: S-508_20230720
Sample Location: FORMER PHL REFINERY
Date Collected: 07/20/23 11:50
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	47800		ug/l	100.	35.0	1	07/25/23 15:53	08/10/23 19:20	EPA 3005A	1,6010D	MRC
Iron, Total	6430		ug/l	50.0	9.00	1	07/25/23 15:53	08/10/23 19:20	EPA 3005A	1,6010D	MRC
Magnesium, Total	53800		ug/l	100.	15.3	1	07/25/23 15:53	08/10/23 19:20	EPA 3005A	1,6010D	MRC
Potassium, Total	5780		ug/l	2500	237.	1	07/25/23 15:53	08/10/23 19:20	EPA 3005A	1,6010D	MRC
Sodium, Total	57200		ug/l	2000	120.	1	07/25/23 15:53	08/10/23 19:20	EPA 3005A	1,6010D	MRC

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-06
Client ID: BF-103R_20230720
Sample Location: FORMER PHL REFINERY
Date Collected: 07/20/23 13:15
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	36200		ug/l	100.	35.0	1	07/25/23 15:53	08/10/23 19:23	EPA 3005A	1,6010D	MRC
Iron, Total	8690		ug/l	50.0	9.00	1	07/25/23 15:53	08/10/23 19:23	EPA 3005A	1,6010D	MRC
Magnesium, Total	9750		ug/l	100.	15.3	1	07/25/23 15:53	08/10/23 19:23	EPA 3005A	1,6010D	MRC
Potassium, Total	4240		ug/l	2500	237.	1	07/25/23 15:53	08/10/23 19:23	EPA 3005A	1,6010D	MRC
Sodium, Total	73200		ug/l	2000	120.	1	07/25/23 15:53	08/10/23 19:23	EPA 3005A	1,6010D	MRC

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-07 Date Collected: 07/20/23 12:00

Client ID: S-437_20230720 Date Received: 07/20/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	11000		ug/l	100.	35.0	1	07/25/23 15:53	08/10/23 19:26	EPA 3005A	1,6010D	MRC
Iron, Total	9980		ug/l	50.0	9.00	1	07/25/23 15:53	08/10/23 19:26	EPA 3005A	1,6010D	MRC
Magnesium, Total	3350		ug/l	100.	15.3	1	07/25/23 15:53	08/10/23 19:26	EPA 3005A	1,6010D	MRC
Potassium, Total	3220		ug/l	2500	237.	1	07/25/23 15:53	08/10/23 19:26	EPA 3005A	1,6010D	MRC
Sodium, Total	22900		ug/l	2000	120.	1	07/25/23 15:53	08/10/23 19:26	EPA 3005A	1,6010D	MRC

Project Name: PESRM UDEX RELEASE
Lab Number: L2341781
Project Number: 213403039
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-08
Client ID: S-439_20230720
Sample Location: FORMER PHL REFINERY
Date Collected: 07/20/23 14:20
Date Received: 07/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	74400		ug/l	100.	35.0	1	07/25/23 15:53	08/10/23 19:30	EPA 3005A	1,6010D	MRC
Iron, Total	57900		ug/l	50.0	9.00	1	07/25/23 15:53	08/10/23 19:30	EPA 3005A	1,6010D	MRC
Magnesium, Total	27700		ug/l	100.	15.3	1	07/25/23 15:53	08/10/23 19:30	EPA 3005A	1,6010D	MRC
Potassium, Total	14400		ug/l	2500	237.	1	07/25/23 15:53	08/10/23 19:30	EPA 3005A	1,6010D	MRC
Sodium, Total	29900		ug/l	2000	120.	1	07/25/23 15:53	08/10/23 19:30	EPA 3005A	1,6010D	MRC

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 02-08 Batch: WG1807431-1										
Calcium, Total	ND		ug/l	100	35.0	1	07/25/23 15:53	08/09/23 09:26	1,6010D	JMF
Iron, Total	ND		ug/l	50.0	9.00	1	07/25/23 15:53	08/09/23 09:26	1,6010D	JMF
Magnesium, Total	ND		ug/l	100	15.3	1	07/25/23 15:53	08/09/23 09:26	1,6010D	JMF
Potassium, Total	ND		ug/l	2500	237.	1	07/25/23 15:53	08/09/23 09:26	1,6010D	JMF
Sodium, Total	254.	J	ug/l	2000	120.	1	07/25/23 15:53	08/09/23 09:26	1,6010D	JMF

Prep Information

Digestion Method: EPA 3005A

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341781

Report Date: 08/18/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 02-08 Batch: WG1807431-2								
Calcium, Total	102		-		80-120	-		
Iron, Total	100		-		80-120	-		
Magnesium, Total	98		-		80-120	-		
Potassium, Total	115		-		80-120	-		
Sodium, Total	113		-		80-120	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341781
Report Date: 08/18/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 02-08 QC Batch ID: WG1807431-3 QC Sample: L2341411-02 Client ID: MS Sample												
Calcium, Total	132000	10000	140000	80		-	-		75-125	-		20
Iron, Total	20900	1000	21900	100		-	-		75-125	-		20
Magnesium, Total	19000	10000	29400	104		-	-		75-125	-		20
Potassium, Total	8520	10000	21400	**129**	Q	-	-		75-125	-		20
Sodium, Total	57100	10000	70900	**138**	Q	-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341781

Report Date: 08/18/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 02-08 QC Batch ID: WG1807431-4 QC Sample: L2341411-02 Client ID: DUP Sample						
Calcium, Total	132000	122000	ug/l	8		20
Iron, Total	20900	19800	ug/l	5		20
Magnesium, Total	19000	18400	ug/l	3		20
Potassium, Total	8520	8110	ug/l	5		20
Sodium, Total	57100	54600	ug/l	4		20

INORGANICS
&
MISCELLANEOUS

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341781
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-02
Client ID: S-509_20230720
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/20/23 09:35
Date Received: 07/20/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Alkalinity, Bicarbonate	336000		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	103000		ug/l	5000	839.	10	-	07/21/23 19:39	44,300.0	CVN
Nitrogen, Nitrate	ND		ug/l	50.0	12.8	1	-	07/21/23 17:14	44,300.0	CVN
Sulfate	191000		ug/l	10000	4540	10	-	07/21/23 19:39	44,300.0	CVN

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341781
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-03
Client ID: S-438_20230720
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/20/23 09:35
Date Received: 07/20/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Alkalinity, Bicarbonate	159000		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	112000		ug/l	5000	839.	10	-	07/21/23 19:51	44,300.0	CVN
Nitrogen, Nitrate	ND		ug/l	50.0	12.8	1	-	07/21/23 17:26	44,300.0	CVN
Sulfate	5510		ug/l	1000	454.	1	-	07/21/23 17:26	44,300.0	CVN

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341781
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-04
Client ID: S-485_20230720
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/20/23 12:25
Date Received: 07/20/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Alkalinity, Bicarbonate	49600		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	1470		ug/l	500	83.9	1	-	07/21/23 17:38	44,300.0	CVN
Nitrogen, Nitrate	174.		ug/l	50.0	12.8	1	-	07/21/23 17:38	44,300.0	CVN
Sulfate	21300		ug/l	1000	454.	1	-	07/21/23 17:38	44,300.0	CVN

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341781
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-05
Client ID: S-508_20230720
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/20/23 11:50
Date Received: 07/20/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Alkalinity, Bicarbonate	312000		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	66400		ug/l	5000	839.	10	-	07/21/23 20:39	44,300.0	CVN
Nitrogen, Nitrate	ND		ug/l	50.0	12.8	1	-	07/21/23 17:50	44,300.0	CVN
Sulfate	121000		ug/l	10000	4540	10	-	07/21/23 20:39	44,300.0	CVN

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341781
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-06
Client ID: BF-103R_20230720
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/20/23 13:15
Date Received: 07/20/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Alkalinity, Bicarbonate	161000		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	56100		ug/l	5000	839.	10	-	07/21/23 20:51	44,300.0	CVN
Nitrogen, Nitrate	ND		ug/l	50.0	12.8	1	-	07/21/23 18:02	44,300.0	CVN
Sulfate	61900		ug/l	1000	454.	1	-	07/21/23 18:02	44,300.0	CVN

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341781
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-07
Client ID: S-437_20230720
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/20/23 12:00
Date Received: 07/20/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Alkalinity, Bicarbonate	34400		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	18700		ug/l	500	83.9	1	-	07/21/23 18:14	44,300.0	CVN
Nitrogen, Nitrate	1900		ug/l	50.0	12.8	1	-	07/21/23 18:14	44,300.0	CVN
Sulfate	32900		ug/l	1000	454.	1	-	07/21/23 18:14	44,300.0	CVN

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2341781
Report Date: 08/18/23

SAMPLE RESULTS

Lab ID: L2341781-08
Client ID: S-439_20230720
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/20/23 14:20
Date Received: 07/20/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Alkalinity, Bicarbonate	276000		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	60800		ug/l	5000	839.	10	-	07/26/23 21:37	44,300.0	CVN
Nitrogen, Nitrate	34.2	J	ug/l	50.0	12.8	1	-	07/21/23 18:26	44,300.0	CVN
Sulfate	ND		ug/l	1000	454.	1	-	07/21/23 18:26	44,300.0	CVN

Project Name: PESRM UDEX RELEASE **Lab Number:** L2341781

Project Number: 213403039 **Report Date:** 08/18/23

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Anions by Ion Chromatography - Westborough Lab for sample(s): 02-08 Batch: WG1806293-1										
Chloride	ND		ug/l	500	83.9	1	-	07/21/23 10:35	44,300.0	CVN
Nitrogen, Nitrate	ND		ug/l	50.0	12.8	1	-	07/21/23 10:35	44,300.0	CVN
Sulfate	ND		ug/l	1000	454.	1	-	07/21/23 10:35	44,300.0	CVN
Anions by Ion Chromatography - Westborough Lab for sample(s): 08 Batch: WG1808216-1										
Chloride	ND		ug/l	500	83.9	1	-	07/26/23 17:15	44,300.0	CVN
Sulfate	ND		ug/l	1000	454.	1	-	07/26/23 17:15	44,300.0	CVN
General Chemistry - Westborough Lab for sample(s): 02-08 Batch: WG1810434-1										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
General Chemistry - Westborough Lab for sample(s): 02-08 Batch: WG1810437-1										
Alkalinity, Bicarbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341781

Report Date: 08/18/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 02-08 Batch: WG1806293-2								
Chloride	103		-		90-110	-		
Nitrogen, Nitrate	103		-		90-110	-		
Sulfate	104		-		90-110	-		
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 08 Batch: WG1808216-2								
Chloride	99		-		90-110	-		
Sulfate	107		-		90-110	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341781
Report Date: 08/18/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 02-08 QC Batch ID: WG1806293-3 QC Sample: L2341781-04 Client ID: S-485_20230720												
Chloride	1470	4000	5510	100		-	-		90-110	-		18
Nitrogen, Nitrate	174.	400	554	96		-	-		90-110	-		15
Sulfate	21300	8000	28900	95		-	-		90-110	-		20
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 08 QC Batch ID: WG1808216-3 QC Sample: L2341024-01 Client ID: MS Sample												
Chloride	ND	4000	3810	96		-	-		90-110	-		18
Sulfate	ND	8000	8090	101		-	-		90-110	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2341781

Report Date: 08/18/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 08 QC Batch ID: WG1808216-4 QC Sample: L2341024-01 Client ID: DUP Sample						
Chloride	ND	ND	ug/l	NC		18
Sulfate	ND	460.J	ug/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 02-08 QC Batch ID: WG1810434-3 QC Sample: L2341781-02 Client ID: S-509_20230720						
Alkalinity, Carbonate	ND	ND	ug CaCO3/L	NC		10
General Chemistry - Westborough Lab Associated sample(s): 02-08 QC Batch ID: WG1810437-3 QC Sample: L2341781-02 Client ID: S-509_20230720						
Alkalinity, Bicarbonate	336000	339000	ug CaCO3/L	1		9

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341781
Report Date: 08/18/23

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent
B	Absent
C	Absent
D	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2341781-01A	Vial HCl preserved	C	NA		5.4	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-01B	Vial HCl preserved	C	NA		5.4	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-01C	Vial HCl preserved	D	NA		5.6	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-01D	Vial HCl preserved	D	NA		5.6	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-02A	Vial HCl preserved	D	NA		5.6	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-02B	Vial HCl preserved	D	NA		5.6	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-02C	Vial HCl preserved	D	NA		5.6	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-02D	Vial HCl preserved	D	NA		5.6	Y	Absent		PA-TPH-GRO(14)
L2341781-02E	Vial HCl preserved	D	NA		5.6	Y	Absent		PA-TPH-GRO(14)
L2341781-02F	Vial HCl preserved	D	NA		5.6	Y	Absent		PA-TPH-GRO(14)
L2341781-02G	20ml Vial HCl preserved	D	NA		5.6	Y	Absent		DISSGAS(14)
L2341781-02H	20ml Vial HCl preserved	D	NA		5.6	Y	Absent		DISSGAS(14)
L2341781-02I	Vial unpreserved 20ml	D	NA		5.6	Y	Absent		DISSGAS-CO2(7)
L2341781-02J	Vial unpreserved 20ml	D	NA		5.6	Y	Absent		DISSGAS-CO2(7)
L2341781-02K	Plastic 250ml HNO3 preserved	C	<2	<2	5.4	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),NA-TI-PPB(180),K-TI-PPB(180),FE-TI-PPB(180)
L2341781-02L	Plastic 250ml Zn Acetate/NaOH preserved	C	>9	>9	5.4	Y	Absent		SUB-SULFIDE()
L2341781-02M	Plastic 250ml Zn Acetate/NaOH preserved	C	>9	>9	5.4	Y	Absent		SUB-SULFIDE()
L2341781-02N	Plastic 250ml unpreserved	C	7	7	5.4	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2341781-02O	Plastic 500ml unpreserved/No Headspace	C	NA		5.4	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)

*Values in parentheses indicate holding time in days

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341781
Report Date: 08/18/23

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2341781-02P	Amber 500ml unpreserved	C	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-02Q	Amber 500ml unpreserved	C	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-02R	Amber 500ml unpreserved	C	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-02S	Amber 500ml unpreserved	C	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-02T	Amber 500ml unpreserved	C	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-02U	Amber 500ml unpreserved	C	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-03A	Vial HCl preserved	D	NA		5.6	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-03B	Vial HCl preserved	D	NA		5.6	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-03C	Vial HCl preserved	D	NA		5.6	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-03D	Vial HCl preserved	D	NA		5.6	Y	Absent		PA-TPH-GRO(14)
L2341781-03E	Vial HCl preserved	D	NA		5.6	Y	Absent		PA-TPH-GRO(14)
L2341781-03F	Vial HCl preserved	D	NA		5.6	Y	Absent		PA-TPH-GRO(14)
L2341781-03G	20ml Vial HCl preserved	D	NA		5.6	Y	Absent		DISSGAS(14)
L2341781-03H	20ml Vial HCl preserved	D	NA		5.6	Y	Absent		DISSGAS(14)
L2341781-03I	Vial unpreserved 20ml	D	NA		5.6	Y	Absent		DISSGAS-CO2(7)
L2341781-03J	Vial unpreserved 20ml	D	NA		5.6	Y	Absent		DISSGAS-CO2(7)
L2341781-03K	Plastic 250ml HNO3 preserved	A	<2	<2	3.2	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),NA-TI-PPB(180),K-TI-PPB(180),FE-TI-PPB(180)
L2341781-03L	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	3.2	Y	Absent		SUB-SULFIDE()
L2341781-03M	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	3.2	Y	Absent		SUB-SULFIDE()
L2341781-03N	Plastic 250ml unpreserved	A	7	7	3.2	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2341781-03O	Plastic 500ml unpreserved/No Headspace	A	NA		3.2	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2341781-03P	Amber 500ml unpreserved	A	7	7	3.2	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-03Q	Amber 500ml unpreserved	A	7	7	3.2	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-03R	Amber 500ml unpreserved	A	7	7	3.2	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-03S	Amber 500ml unpreserved	A	7	7	3.2	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-03T	Amber 500ml unpreserved	A	7	7	3.2	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-03U	Amber 500ml unpreserved	A	7	7	3.2	Y	Absent		PA-TPH-DROD-C44(7)

*Values in parentheses indicate holding time in days

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341781
Report Date: 08/18/23

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2341781-04A	Vial HCl preserved	D	NA		5.6	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-04B	Vial HCl preserved	D	NA		5.6	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-04C	Vial HCl preserved	D	NA		5.6	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-04D	Vial HCl preserved	D	NA		5.6	Y	Absent		PA-TPH-GRO(14)
L2341781-04E	Vial HCl preserved	D	NA		5.6	Y	Absent		PA-TPH-GRO(14)
L2341781-04F	Vial HCl preserved	D	NA		5.6	Y	Absent		PA-TPH-GRO(14)
L2341781-04G	20ml Vial HCl preserved	D	NA		5.6	Y	Absent		DISSGAS(14)
L2341781-04H	20ml Vial HCl preserved	D	NA		5.6	Y	Absent		DISSGAS(14)
L2341781-04I	Vial unpreserved 20ml	D	NA		5.6	Y	Absent		DISSGAS-CO2(7)
L2341781-04J	Vial unpreserved 20ml	D	NA		5.6	Y	Absent		DISSGAS-CO2(7)
L2341781-04K	Plastic 250ml HNO3 preserved	A	<2	<2	3.2	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),K-TI-PPB(180),NA-TI-PPB(180),FE-TI-PPB(180)
L2341781-04L	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	3.2	Y	Absent		SUB-SULFIDE()
L2341781-04M	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	3.2	Y	Absent		SUB-SULFIDE()
L2341781-04N	Plastic 250ml unpreserved	A	7	7	3.2	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2341781-04O	Plastic 500ml unpreserved/No Headspace	A	NA		3.2	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2341781-04P	Amber 500ml unpreserved	A	7	7	3.2	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-04Q	Amber 500ml unpreserved	A	7	7	3.2	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-04R	Amber 500ml unpreserved	A	7	7	3.2	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-04S	Amber 500ml unpreserved	A	7	7	3.2	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-04T	Amber 500ml unpreserved	A	7	7	3.2	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-04U	Amber 500ml unpreserved	A	7	7	3.2	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-05A	Vial HCl preserved	C	NA		5.4	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-05B	Vial HCl preserved	C	NA		5.4	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-05C	Vial HCl preserved	C	NA		5.4	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-05D	Vial HCl preserved	C	NA		5.4	Y	Absent		PA-TPH-GRO(14)
L2341781-05E	Vial HCl preserved	C	NA		5.4	Y	Absent		PA-TPH-GRO(14)
L2341781-05F	Vial HCl preserved	C	NA		5.4	Y	Absent		PA-TPH-GRO(14)

*Values in parentheses indicate holding time in days

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2341781-05G	20ml Vial HCl preserved	C	NA		5.4	Y	Absent		DISSGAS(14)
L2341781-05H	20ml Vial HCl preserved	C	NA		5.4	Y	Absent		DISSGAS(14)
L2341781-05I	Vial unpreserved 20ml	C	NA		5.4	Y	Absent		DISSGAS-CO2(7)
L2341781-05J	Vial unpreserved 20ml	C	NA		5.4	Y	Absent		DISSGAS-CO2(7)
L2341781-05K	Plastic 250ml HNO3 preserved	C	<2	<2	5.4	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),K-TI-PPB(180),NA-TI-PPB(180),FE-TI-PPB(180)
L2341781-05L	Plastic 250ml Zn Acetate/NaOH preserved	C	>9	>9	5.4	Y	Absent		SUB-SULFIDE()
L2341781-05M	Plastic 250ml Zn Acetate/NaOH preserved	C	>9	>9	5.4	Y	Absent		SUB-SULFIDE()
L2341781-05N	Plastic 250ml unpreserved	D	7	7	5.6	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2341781-05O	Plastic 500ml unpreserved/No Headspace	D	NA		5.6	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2341781-05P	Amber 500ml unpreserved	D	7	7	5.6	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-05Q	Amber 500ml unpreserved	D	7	7	5.6	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-05R	Amber 500ml unpreserved	D	7	7	5.6	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-05S	Amber 500ml unpreserved	D	7	7	5.6	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-05T	Amber 500ml unpreserved	D	NA		5.6	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-05U	Amber 500ml unpreserved	D	NA		5.6	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-06A	Vial HCl preserved	C	NA		5.4	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-06B	Vial HCl preserved	C	NA		5.4	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-06C	Vial HCl preserved	C	NA		5.4	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-06D	Vial HCl preserved	C	NA		5.4	Y	Absent		PA-TPH-GRO(14)
L2341781-06E	Vial HCl preserved	C	NA		5.4	Y	Absent		PA-TPH-GRO(14)
L2341781-06F	Vial HCl preserved	C	NA		5.4	Y	Absent		PA-TPH-GRO(14)
L2341781-06G	20ml Vial HCl preserved	C	NA		5.4	Y	Absent		DISSGAS(14)
L2341781-06H	20ml Vial HCl preserved	C	NA		5.4	Y	Absent		DISSGAS(14)
L2341781-06I	Vial unpreserved 20ml	C	NA		5.4	Y	Absent		DISSGAS-CO2(7)
L2341781-06J	Vial unpreserved 20ml	C	NA		5.4	Y	Absent		DISSGAS-CO2(7)
L2341781-06K	Plastic 250ml HNO3 preserved	C	>9	>9	5.4	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),K-TI-PPB(180),NA-TI-PPB(180),FE-TI-PPB(180)
L2341781-06L	Plastic 250ml Zn Acetate/NaOH preserved	C	>9	>9	5.4	Y	Absent		SUB-SULFIDE()

*Values in parentheses indicate holding time in days

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341781
Report Date: 08/18/23

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2341781-06M	Plastic 250ml Zn Acetate/NaOH preserved	C	>9	>9	5.4	Y	Absent		SUB-SULFIDE()
L2341781-06N	Plastic 250ml unpreserved	C	NA		5.4	Y	Absent		ALK-HCO3-2320-PPB(14),SO4-300-PPB(28),CL-300-PPB(28),ALK-CO3-2320-PPB(14),NO3-300-PPB(2)
L2341781-06O	Plastic 500ml unpreserved/No Headspace	C	NA		5.4	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2341781-06P	Amber 500ml unpreserved	C	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-06Q	Amber 500ml unpreserved	C	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-06R	Amber 500ml unpreserved	C	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-06S	Amber 500ml unpreserved	C	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-06T	Amber 500ml unpreserved	C	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-06U	Amber 500ml unpreserved	C	7	7	5.4	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-07A	Vial HCl preserved	B	NA		4.7	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-07B	Vial HCl preserved	B	NA		4.7	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-07C	Vial HCl preserved	B	NA		4.7	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-07D	Vial HCl preserved	B	NA		4.7	Y	Absent		PA-TPH-GRO(14)
L2341781-07E	Vial HCl preserved	B	NA		4.7	Y	Absent		PA-TPH-GRO(14)
L2341781-07F	Vial HCl preserved	B	NA		4.7	Y	Absent		PA-TPH-GRO(14)
L2341781-07G	20ml Vial HCl preserved	B	NA		4.7	Y	Absent		DISSGAS(14)
L2341781-07H	20ml Vial HCl preserved	B	NA		4.7	Y	Absent		DISSGAS(14)
L2341781-07I	Vial unpreserved 20ml	B	NA		4.7	Y	Absent		DISSGAS-CO2(7)
L2341781-07J	Vial unpreserved 20ml	B	NA		4.7	Y	Absent		DISSGAS-CO2(7)
L2341781-07K	Plastic 250ml HNO3 preserved	B	<2	<2	4.7	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),K-TI-PPB(180),NA-TI-PPB(180),FE-TI-PPB(180)
L2341781-07L	Plastic 250ml Zn Acetate/NaOH preserved	B	>9	>9	4.7	Y	Absent		SUB-SULFIDE()
L2341781-07M	Plastic 250ml Zn Acetate/NaOH preserved	B	>9	>9	4.7	Y	Absent		SUB-SULFIDE()
L2341781-07N	Plastic 250ml unpreserved	B	7	7	4.7	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2341781-07O	Plastic 500ml unpreserved/No Headspace	B	NA		4.7	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2341781-07P	Amber 500ml unpreserved	B	7	7	4.7	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-07Q	Amber 500ml unpreserved	B	7	7	4.7	Y	Absent		PA-TPH-DROD-C44(7)

*Values in parentheses indicate holding time in days

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341781
Report Date: 08/18/23

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2341781-07R	Amber 500ml unpreserved	B	7	7	4.7	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-07S	Amber 500ml unpreserved	B	7	7	4.7	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-07T	Amber 500ml unpreserved	B	7	7	4.7	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-07U	Amber 500ml unpreserved	B	7	7	4.7	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-08A	Vial HCl preserved	A	NA		3.2	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-08B	Vial HCl preserved	A	NA		3.2	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-08C	Vial HCl preserved	A	NA		3.2	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2341781-08D	Vial HCl preserved	A	NA		3.2	Y	Absent		PA-TPH-GRO(14)
L2341781-08E	Vial HCl preserved	A	NA		3.2	Y	Absent		PA-TPH-GRO(14)
L2341781-08F	Vial HCl preserved	A	NA		3.2	Y	Absent		PA-TPH-GRO(14)
L2341781-08G	20ml Vial HCl preserved	A	NA		3.2	Y	Absent		DISSGAS(14)
L2341781-08H	20ml Vial HCl preserved	A	NA		3.2	Y	Absent		DISSGAS(14)
L2341781-08I	Vial unpreserved 20ml	A	NA		3.2	Y	Absent		DISSGAS-CO2(7)
L2341781-08J	Vial unpreserved 20ml	A	NA		3.2	Y	Absent		DISSGAS-CO2(7)
L2341781-08K	Plastic 250ml HNO3 preserved	A	<2	<2	3.2	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),K-TI-PPB(180),NA-TI-PPB(180),FE-TI-PPB(180)
L2341781-08L	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	3.2	Y	Absent		SUB-SULFIDE()
L2341781-08M	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	3.2	Y	Absent		SUB-SULFIDE()
L2341781-08N	Plastic 250ml unpreserved	A	7	7	3.2	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2341781-08O	Plastic 500ml unpreserved/No Headspace	A	NA		3.2	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2341781-08P	Amber 500ml unpreserved	A	7	7	3.2	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-08Q	Amber 500ml unpreserved	A	7	7	3.2	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-08R	Amber 500ml unpreserved	A	7	7	3.2	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-08S	Amber 500ml unpreserved	A	7	7	3.2	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-08T	Amber 500ml unpreserved	A	7	7	3.2	Y	Absent		PA-TPH-DROD-C44(7)
L2341781-08U	Amber 500ml unpreserved	A	7	7	3.2	Y	Absent		PA-TPH-DROD-C44(7)

*Values in parentheses indicate holding time in days

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2341781
Report Date: 08/18/23

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)

Container Comments

L2341781-03N	CRACKED CAP
L2341781-04P	CRACKED CAP
L2341781-04Q	CRACKED CAP
L2341781-06O	RECEIVED EMPTY/CAP NOT ON CONTAINER

*Values in parentheses indicate holding time in days

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2341781
Project Number:	213403039	**Report Date:**	08/18/23

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: DU Report with 'J' Qualifiers

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2341781
Project Number:	213403039	**Report Date:**	08/18/23

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively

Report Format: DU Report with 'J' Qualifiers

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2341781
Project Number:	213403039	**Report Date:**	08/18/23

Data Qualifiers

Identified Compounds (TICs). For calculated parameters, this represents that one or more values used in the calculation were estimated.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

ND - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2341781
Project Number:	213403039	**Report Date:**	08/18/23

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.

44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.

117 Technical Guidance for the Natural Attenuation Indicators: Methane, Ethane, and Ethene, EPA-NE, Revision 1, February 21, 2002 and Sample Preparation & Calculations for Dissolved Gas Analysis in Water Samples using a GC Headspace Equilibration Technique, EPA RSKSOP-175, Revision 2, May 2004.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193
Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 7/21/23

ALPHA Job #: L2341781

Client Information

Client: PESRM c/o Stantec
Address: 1060 Andrew Drive, Suite 140
West Chester, PA 19380
Phone: 610-840-2500
Fax: 610-840-2501
Email: andrew.klingbeil@stantec.com
☐ These samples have been Previously analyzed by Alpha

Project Information

Project Name: PESRM UDEX Release
Project Location: Former PHL Refinery
Project #: 213403039
Project Manager: Andrew Klingbeil
ALPHA Quote #: 21953

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)
Due Date: Time:

Report Information Data Deliverables

☐ FAX ☒ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program: PA One Cleanup
Criteria:

Other Project Specific Requirements/Comments/Detection Limits:
See quote 21953 and July 14, 2023 email from Andrew K for details on analyses

ANALYSIS

SAMPLE HANDLING
Filtration
☐ Done ☒ Not Needed ☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	PA Vollatile Organics 8260C	TPH - GRO, Extended Ranges 8015D	Alkalinity (Carb and Bicarb) 2320B	Chloride,Sulfate,Nitrate 300	Dissolved gases (incl CO2)	Total Ca, Fe, Mg, K, Na 6010D	Sulfide SM 4500	Sample Specific Comments
L1178-01	Trip Blank	--	--	TB	--	☒	☐	☐	☐	☐	☐	☐	
-02	S-509_20230720	7/20/23	9:35	GW	BO	☒	☒	☒	☒	☒	☒	☒	
-03	S-438_20230720	7/20/23	9:35	GW	CD	☒	☒	☒	☒	☒	☒	☒	
-04	S-485_20230720	7/20/23	12:25	GW	CD	☒	☒	☒	☒	☒	☒	☒	
-05	S-508_20230720	7/20/23	11:50	GW	BO	☒	☒	☒	☒	☒	☒	☒	
-06	BF-103R_20230720	7/20/23	13:15	GW	BO	☒	☒	☒	☒	☒	☒	☒	
-07	20230720_S-437	7/20/23	12:00	GW	AA	☒	☒	☒	☒	☒	☒	☒	
-08	S-439_20230720	7/20/23	14:20	GW	DD	☒	☒	☒	☒	☒	☒	☒	
						☐	☐	☐	☐	☐	☐	☐	
						☐	☐	☐	☐	☐	☐	☐	
Container Type						-	-	-	-	-	-	-	
Preservative						-	-	-	-	-	-	-	

Relinquished By:	Date/Time	Received By:	Date/Time
	7/20/23 1454		7.20.23 1454
	7.20.23 1600		7-20-23 1600
	7-20-1850		7/20/23 19:10
	7/20/23		7/20/23 22:20
			7/21/23 01:00

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

FORM NO: 01-01(I-NJ) (rev. 5-JAN-12)

Pace Analytical Services, LLC
575 Broad Hollow Road
Melville, NY 11747
516-370-6000

August 18, 2023

Reports
Alpha Analytical
8 Walkup Drive
Westborough, MA 01581

RE: Project: L2341781
Pace Project No.: 70264352

Dear Reports:

Enclosed are the analytical results for sample(s) received by the laboratory on July 25, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Melville

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Wayne Bryce
wayne.bryce@pacelabs.com
516-886-5527
Project Manager

Enclosures

cc: Michael Chang, Alpha Analytical
Candy Fox, Alpha Analytical
Ben Rao, Alpha Analytical

Pace Analytical Services, LLC
575 Broad Hollow Road
Melville, NY 11747
516-370-6000

CERTIFICATIONS

Project: L2341781
Pace Project No.: 70264352

Pace Analytical Services Long Island
575 Broad Hollow Rd, Melville, NY 11747
Connecticut Certification #: PH-0435
Delaware Certification # NY 10478
Maryland Certification #: 208
Massachusetts Certification #: M-NY026
New Hampshire Certification #: 2987
New Jersey Certification #: NY158
New York Certification #: 10478 Primary Accrediting Body
Pennsylvania Certification #: 68-00350
Rhode Island Certification #: LAO00340
Virginia Certification # 460302

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575 Broad Hollow Road
Melville, NY 11747
516-370-6000

ANALYTICAL RESULTS

Project: L2341781
Pace Project No.: 70264352

Sample: S-509_20230720 **Lab ID: 70264352001** Collected: 07/20/23 09:35 Received: 07/25/23 04:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
4500S2F W Sulfide Iodometric	Analytical Method: SM22 4500-S2 F Pace Analytical Services - Melville							
Sulfide	**<2.0**	mg/L	2.0	1		07/26/23 16:25		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: L2341781
Pace Project No.: 70264352

Sample: S-438_20230720 **Lab ID: 70264352002** Collected: 07/20/23 09:35 Received: 07/25/23 04:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
4500S2F W Sulfide Iodometric	Analytical Method: SM22 4500-S2 F Pace Analytical Services - Melville							
Sulfide	**<2.0**	mg/L	2.0	1		07/26/23 16:27		

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ANALYTICAL RESULTS

Project: L2341781
Pace Project No.: 70264352

Sample: S-485_20230720 **Lab ID: 70264352003** Collected: 07/20/23 12:25 Received: 07/25/23 04:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
4500S2F W Sulfide Iodometric	Analytical Method: SM22 4500-S2 F Pace Analytical Services - Melville							
Sulfide	**<2.0**	mg/L	2.0	1		07/26/23 16:29		

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Melville, NY 11747
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ANALYTICAL RESULTS

Project: L2341781
Pace Project No.: 70264352

Sample: S-508_20230720 **Lab ID: 70264352004** Collected: 07/20/23 11:50 Received: 07/25/23 04:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
4500S2F W Sulfide Iodometric	Analytical Method: SM22 4500-S2 F Pace Analytical Services - Melville							
Sulfide	**<2.0**	mg/L	2.0	1		07/26/23 16:31		

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Melville, NY 11747
516-370-6000

ANALYTICAL RESULTS

Project: L2341781
Pace Project No.: 70264352

Sample: BF-103R 20230720 **Lab ID: 70264352005** Collected: 07/20/23 13:15 Received: 07/25/23 04:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
4500S2F W Sulfide Iodometric	Analytical Method: SM22 4500-S2 F Pace Analytical Services - Melville							
Sulfide	**<2.0**	mg/L	2.0	1		07/26/23 16:33		

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ANALYTICAL RESULTS

Project: L2341781
Pace Project No.: 70264352

Sample: S-437_20230720 **Lab ID: 70264352006** Collected: 07/20/23 12:00 Received: 07/25/23 04:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
4500S2F W Sulfide Iodometric	Analytical Method: SM22 4500-S2 F Pace Analytical Services - Melville							
Sulfide	**<2.0**	mg/L	2.0	1		07/26/23 16:35		

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Melville, NY 11747
516-370-6000

ANALYTICAL RESULTS

Project: L2341781
Pace Project No.: 70264352

Sample: S-439_20230720 **Lab ID: 70264352007** Collected: 07/20/23 14:20 Received: 07/25/23 04:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
4500S2F W Sulfide Iodometric	Analytical Method: SM22 4500-S2 F Pace Analytical Services - Melville							
Sulfide	**<2.0**	mg/L	2.0	1		07/26/23 16:37		

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
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Melville, NY 11747
516-370-6000

QUALITY CONTROL DATA

Project: L2341781
Pace Project No.: 70264352

QC Batch: 313803 | Analysis Method: SM22 4500-S2 F
QC Batch Method: SM22 4500-S2 F | Analysis Description: 4500S2F W Sulfide Iodometric
Laboratory: Pace Analytical Services - Melville
Associated Lab Samples: 70264352001, 70264352002, 70264352003, 70264352004, 70264352005, 70264352006, 70264352007

METHOD BLANK: 1595418 Matrix: Water
Associated Lab Samples: 70264352001, 70264352002, 70264352003, 70264352004, 70264352005, 70264352006, 70264352007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfide	mg/L	ND	2.0	07/26/23 16:19	

LABORATORY CONTROL SAMPLE & LCSD: 1595419 1595420

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Sulfide	mg/L	14	14.0	14.0	100	100	85-115	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
575 Broad Hollow Road
Melville, NY 11747
516-370-6000

QUALIFIERS

Project: L2341781
Pace Project No.: 70264352

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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575 Broad Hollow Road
Melville, NY 11747
516-370-6000

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: L2341781
Pace Project No.: 70264352

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
70264352001	**S-509_20230720**	SM22 4500-S2 F	313803		
70264352002	**S-438_20230720**	SM22 4500-S2 F	313803		
70264352003	**S-485_20230720**	SM22 4500-S2 F	313803		
70264352004	**S-508_20230720**	SM22 4500-S2 F	313803		
70264352005	**BF-103R 20230720**	SM22 4500-S2 F	313803		
70264352006	**S-437_20230720**	SM22 4500-S2 F	313803		
70264352007	**S-439_20230720**	SM22 4500-S2 F	313803		

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Subcontract Chain of Custody

Pace Analytical (NY)
575 Broad Hollow Road
Melville, NY 11747

Alpha Job Number
L2341781

Client Information	Project Information	Regulatory Requirements/Report Limits
Client: Alpha Analytical Labs Address: Eight Walkup Drive Westborough, MA 01581-1019 Phone: 508.439.5155 Email: mvitanza@alphalab.com	Project Location: PA Project Manager: Marty Vitanza **Turnaround & Deliverables Information** Due Date: Deliverables:	State/Federal Program: Regulatory Criteria:

Project Specific Requirements and/or Report Requirements

Reference following Alpha Job Number on final report/deliverables: L2341781

Report to include Method Blank, LCS/LCSD:

Additional Comments: Send all results/reports to subreports@alphalab.com

Lab ID	Client ID	Collection Date/Time	Sample Matrix	Analysis	Batch QC
	S-509_20230720	07-20-23 09:35	WATER	Sulfide	
	S-438_20230720	07-20-23 09:35	WATER	Sulfide	
	S-485_20230720	07-20-23 12:25	WATER	Sulfide	
	S-508_20230720	07-20-23 11:50	WATER	Sulfide	
	BF-103R_20230720	07-20-23 13:15	WATER	Sulfide	
	20230720_S-437	07-20-23 12:00	WATER	Sulfide	
	S-439_20230720	07-20-23 14:20	WATER	Sulfide	

WO# : 70264352

70264352

	Relinquished By:	Date/Time:	Received By:	Date/Time:
		7/24/23		7/24/23 17:30
	DAC	7/24/23 23:15	DAC	7/24/23 23:20
Form No: AL_subcoc	Paul Focco AA2	7/25/23 8:05	Paul Focco AA2	7/25/23 4:10

Serial_No:08182313:50

Client: ALPHA Profile #: 5378

Work ID: L2341781 COC Page _____ of _____

☐ Use Point Number Spreadsheet ☐ Multiday Project

☐ Add SCLOGFD to first sample for field charge

COC Line Item	Matrix	VG9U	VG9C	VG9H	VG9S	DG9T	DG9Y	DG9P	DG9A	DG6T	DG9S	AG4U	AG3U	AG2U	AG1U	AG34	AG3S	AG4E	AG3T	AG2R	AG1T	AG1H	AG1A	CG1U	BP4U	BP3U	BP2U	BP1U	BP3S	BP2S	BP4N	BP3N	BP2N	BP3C	BP3T	BP3S	BP3R	BP1Z	BP1N	BP1B	SP5T	R	WG2U	WGFU	WGKU	WGDU	ZPLC	GN	WP	IOC	SOC
1																																																					
2																																																					
3																																																					
4																																																					
5																																																					
6																																																					
7																																																					
8																																																					
9																																																					
10																																																					
11																																																					
12																																																					

Container Codes

Glass			
VG9U	40mL unpres clear vial	AG4U	125mL unpres amber glass
VG9C	40mL Ascorbic-HCl clear vial	AG3U	250mL unpres amber glass
VG9H	40mL HCl clear vial	AG2U	500mL unpres amber glass
VG9S	40mL Sulfuirc clear vial	AG1U	1liter unpres amber glass
DG9T	40mL Na Thiosulfate vial	AG34	Ammonium Cl 250mL bottle
DG9Y	40mL Citrate-Na Thiosulfate	AG3S	250mL H2SO4 amber glass
DG9P	40mL amber vial - TSP	AG4E	125mL EDA amber glass
DG9A	Ascorbic/Maleic Acid 40mL	AG3T	250mL Na Thio amber glass
DG6T	Na Thio 60mL Vial	AG2R	Na Sulfite 500mL (blue Cap)
DG9S	Ammonium Cl/CuSO4 40mL	AG1T	Na Thiosulfate 1L bottle
CG1U	1L Unpres Jar (Con Ed)	AG1H	1L HCl amber glass
		AG1A	(NH4Cl)
WG9O	8oz clear soil jar		
WG4O	4oz clear soil jar		

Plastic		Misc.	
BP4U	125mL unpreserved plastic	SP5T	120mL Coliform Na Thio
BP3U	250mL unpreserved plastic	R	Terracore Kit
BP2U	500mL unpreserved plastic	WG2U	2oz Unpreserved Jar
BP1U	1L unpreserved plastic	WGFU	4oz Unpreserved Jar
BP4N	125mL HNO3 plastic	WGKU	8oz Unpreserved Jar
BP3N	250mL HNO3 plastic	WGDU	16oz Unpreserved Jar
BP2N	500mL HNO3 plastic	ZPLC	Ziplock Bag
BP3S	250mL H2SO4 plastic	TEDL	Tedlar Bag
BP2S	500mL H2SO4 plastic	BG1H	1L HCL Clear Glass
BP3C	NaOH 250mL bottle	GN	General
BP3T	250mL Trizma	WP	Wipe
BP35	250mL Ammonium Acetate		
BP3R	250mL NH4SO4-NH4OH		
BP1Z	1L NaOH, Zn Acetate		
BP1N	1L HNO3 plastic		
BP1B	Na Thiosulfate Amber Bottle		

IOC	
BP1U	1L unpreserved plastic
BP3N*	250mL HNO3 plastic
BP3C	250mL Sodium Hydroxide
AG2U	500mL unpres amber glass

* Can also be a BP4N

Matrix	
WT	Water
SL	Solid
NAL	Non-aqueous Liquid
OL	OIL
WP	Wipe
DW	Drinking Water

SOC	
VG9T	40mL Na Thio amber vial
DG9A	40mL Ascorbic acid/ maleic Acid vials
DG9Y	Citrate/Na Thiosulfate 40mL
DG6T	Na Thiosulfate 60mL vial
DG6M	MonoClActetic/Na Thio 60mL
AG3U	250mL unpres amber glass
AG3T	Na Thiosulfate 250mL bottle
BP1B	Na Thiosulfate Amber bottle
AG1T	Na Thiosultate 1L Amber
AG1A	525.3 Chemical Blend

Sender Initials _____

Additional Comments

WO#: 70264352
PM: WB Due Date: 08/03/23
CLIENT: ALPHA

Serial_No:08182313:50

DC#_Title: ENV-FRM-MELV-0024 v4_SCUR
Effective Date: 5/23/2023

WO# : 70264352
PM: WB **Due Date: 08/03/23**
CLIENT: ALPHA

Client Name: ALPHA Project #

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Commercial ☐ Pace ☐ Other

Tracking #:

Custody Seal on Cooler/Box Present: ☐ Yes ☑ No Seals intact: ☑ Yes ☐ No Temperature Blank Present: ☐ Yes ☐ No
Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ Ziploc ☐ None ☐ Other Type of Ice: Wet Blue None

Thermometer Used: TH188 Correction Factor: -0.3 ☐ Samples on ice, cooling process has begun
Cooler Temperature(°C): 2.4 Cooler Temperature Corrected(°C): 2.1 Date/Time 5035A kits placed in freezer
Temp should be above freezing to 6.0°C

USDA Regulated Soil (☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check map)? ☐ Yes ☐ No

Did samples orignate from a foreign source including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (ENV-FRM-MELV-0076) and include with SCUR/COC paperwork.

Date and Initials of person examining contents: SH 7/25/23

				COMMENTS:
Chain of Custody Present:	☑Yes	☐No		1.
Chain of Custody Filled Out:	☑Yes	☐No		2.
Chain of Custody Relinquished:	☑Yes	☐No		3.
Sampler Name & Signature on COC:	☑Yes	☐No	☐N/A	4.
Samples Arrived within Hold Time:	☑Yes	☐No		5.
Short Hold Time Analysis (<72hr):	☐Yes	☑No		6.
Rush Turn Around Time Requested	☐Yes	☑No		7.
Sufficient Volume: (Triple volume provided for MS/MSD)	☑Yes	☐No		8.
Correct Containers Used:	☑Yes	☐No		9.
-Pace Containers Used:	☑Yes	☐No		
Containers Intact:	☑Yes	☐No		10.
Filtered volume received for Dissolved tests	☐Yes	☐No	☑N/A	11. Note: if sediment is visible in the dissolved container.
Sample Labels match COC: -Includes date/time/ID/Analysis	☑Yes	☐No		12.
Matrix:	SL (WT) OIL OTHER			

Date and Initials of person checking preservation: SH 7/25/23

All containers needing preservation have been pH paper Lot #	☐Yes	☐No	☑N/A	13. ☐ HNO_3 ☐ H_2SO_4 ☐ NaOH ☐ HCl Sample #
All containers needing preservation are found to be in compliance with method recommendation? (HNO_3, H_2SO_4, HCl, NAOH>9 Sulfide, NAOH>12 Cyanide)	☐Yes	☐No	☑N/A	
Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water). Per Method, VOA pH is checked after analysis				Initial when completed: / Lot # of added preservative: / Date/Time preservative added:
Samples checked for dechlorination: KI starch test strips Lot # Residual chlorine strips Lot #	☐Yes	☐No	☑N/A	14. Positive for Res. Chlorine? Y N
SM 4500 CN samples checked for sul Lead Acetate Strips Lot #	☐Yes	☐No	☑N/A	15. Positive for Sulfide? Y N
Headspace in VOA Vials (>6mm):	☐Yes	☐No	☑N/A	16.
Trip Blank Present:	☐Yes	☐No	☑N/A	17.
Trip Blank Custody Seals Present	☐Yes	☐No	☑N/A	

Client Notification/ Resolution: Field Data Required? Y / N
Person Contacted: Date/Time:
Comments/ Resolution:

* PM (Project Manager) review is documented electronically in LIMS.

ANALYTICAL REPORT

Lab Number:	L2342282
Client:	Stantec, Inc. 1060 Andrew Drive Suite 140 West Chester, PA 19380
ATTN:	Andrew Klingbeil
Phone:	(610) 840-2525
Project Name:	PESRM UDEX RELEASE
Project Number:	213403039
Report Date:	08/11/23

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Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342282
Report Date: 08/11/23

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2342282-01	S-480_SL_20230724	WATER	FORMER PHL REFINERY	07/21/23 12:10	07/21/23
L2342282-02	S-481_20230721	WATER	FORMER PHL REFINERY	07/21/23 11:40	07/21/23
L2342282-03	S-482_20230720	WATER	FORMER PHL REFINERY	07/20/23 15:00	07/21/23
L2342282-04	TRIP BLANK	WATER	FORMER PHL REFINERY	07/17/23 00:00	07/21/23
L2342282-05	S-283_SL_20230721	WATER	FORMER PHL REFINERY	07/21/23 14:35	07/21/23
L2342282-06	S-382_SL_20230721	WATER	FORMER PHL REFINERY	07/21/23 14:45	07/21/23

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2342282
Project Number:	213403039	**Report Date:**	08/11/23

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2342282
Project Number:	213403039	**Report Date:**	08/11/23

Case Narrative (continued)

Report Submission

August 11, 2023: This final report includes the results of all requested analyses.

August 04, 2023: This is a preliminary report.

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

The analysis of Sulfide was subcontracted. A copy of the laboratory report is included as an addendum. Please note: This data is only available in PDF format and is not available on Data Merger.

Sample Receipt

L2342282-02: Headspace was noted in the sample containers submitted for Carbonate Alkalinity and Bicarbonate Alkalinity.

L2342282-03: A container for Dissolved Gases - CO2 was received broken; however, there was adequate sample remaining to perform the requested analysis.

Volatile Organics by SIM

L2342282-02D, -03D, -05D, and -06D: The sample has elevated detection limits due to the dilution required by the elevated concentrations of non-target compounds in the sample.

Carbon Dioxide

L2342282-01D, -02D, -03D, -05D, and -06D: The sample has elevated detection limits due to the dilution required by the elevated concentrations of target compounds in the sample.

Anions by Ion Chromatography

L2342282-01 through -06: The sample was analyzed for Nitrate with the method required holding time exceeded.

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2342282
Project Number:	213403039	**Report Date:**	08/11/23

Case Narrative (continued)

The WG1807143-3 MS recoveries, performed on L2342282-02, are outside the acceptance criteria for sulfate (82%) and chloride (50%); however, the associated LCS recoveries are within criteria. No further action was taken.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:  Cristin Walker

Title: Technical Director/Representative Date: 08/11/23

ORGANICS

VOLATILES

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-01
Client ID: S-480_SL_20230724
Sample Location: FORMER PHL REFINERY
Date Collected: 07/21/23 12:10
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 08/03/23 07:17
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	5.0	0.24	1
Chloromethane	ND		ug/l	2.5	0.20	1
Vinyl chloride	0.15	J	ug/l	1.0	0.07	1
Bromomethane	ND		ug/l	1.0	0.26	1
Chloroethane	ND		ug/l	1.0	0.13	1
Trichlorofluoromethane	ND		ug/l	2.5	0.16	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
Carbon disulfide	8.6		ug/l	5.0	0.30	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15	1
Methylene chloride	ND		ug/l	2.5	0.68	1
Acetone	ND		ug/l	5.0	1.5	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16	1
Methyl Acetate	ND		ug/l	2.0	0.23	1
Methyl tert butyl ether	6.2		ug/l	1.0	0.17	1
1,1-Dichloroethane	ND		ug/l	0.75	0.21	1
cis-1,2-Dichloroethene	0.22	J	ug/l	0.50	0.19	1
1,2-Dichloroethene, Total	0.22	J	ug/l	0.50	0.16	1
Cyclohexane	86		ug/l	10	0.27	1
Bromochloromethane	ND		ug/l	2.5	0.15	1
Chloroform	ND		ug/l	0.75	0.22	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16	1
2-Butanone	ND		ug/l	5.0	1.9	1
Benzene	23		ug/l	0.50	0.16	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
Methyl cyclohexane	130		ug/l	10	0.40	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-01 Date Collected: 07/21/23 12:10

Client ID: S-480_SL_20230724 Date Received: 07/21/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	0.50	0.19	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
Toluene	0.92		ug/l	0.75	0.20	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,2-Dibromoethane	ND		ug/l	2.0	0.19	1
2-Hexanone	ND		ug/l	5.0	0.52	1
Chlorobenzene	ND		ug/l	0.50	0.18	1
Ethylbenzene	31		ug/l	0.50	0.17	1
p/m-Xylene	110		ug/l	1.0	0.33	1
o-Xylene	0.69	J	ug/l	1.0	0.39	1
Xylenes, Total	110	J	ug/l	1.0	0.33	1
Styrene	ND		ug/l	1.0	0.36	1
Bromoform	ND		ug/l	2.0	0.25	1
Isopropylbenzene	16		ug/l	0.50	0.19	1
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	108		70-130
Toluene-d8	101		70-130
4-Bromofluorobenzene	108		70-130
Dibromofluoromethane	98		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-01 Date Collected: 07/21/23 12:10
Client ID: S-480_SL_20230724 Date Received: 07/21/23
Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 08/03/23 07:17
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	1.1	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	89		70-130
4-Bromofluorobenzene	98		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-01
Client ID: S-480_SL_20230724
Sample Location: FORMER PHL REFINERY
Date Collected: 07/21/23 12:10
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/27/23 17:18
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	6290		ug/l	2.00	2.00	1	A
Ethene	ND		ug/l	0.500	0.500	1	A
Ethane	ND		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-01 D
Client ID: S-480_SL_20230724
Sample Location: FORMER PHL REFINERY

Date Collected: 07/21/23 12:10
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/24/23 13:57
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	59.8		mg/l	6.00	6.00	2

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-02
Client ID: S-481_20230721
Sample Location: FORMER PHL REFINERY
Date Collected: 07/21/23 11:40
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/31/23 10:05
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	2.71		ug/l	2.00	2.00	1	A
Ethene	ND		ug/l	0.500	0.500	1	A
Ethane	ND		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-02 D2
Client ID: S-481_20230721
Sample Location: FORMER PHL REFINERY

Date Collected: 07/21/23 11:40
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 08/02/23 14:17
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Benzene	35000		ug/l	250	80.	500

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	107		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	109		70-130
Dibromofluoromethane	98		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-02 D
Client ID: S-481_20230721
Sample Location: FORMER PHL REFINERY

Date Collected: 07/21/23 11:40
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 08/01/23 13:59
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	1000	49.	200
Chloromethane	ND		ug/l	500	40.	200
Vinyl chloride	ND		ug/l	200	14.	200
Bromomethane	ND		ug/l	200	51.	200
Chloroethane	ND		ug/l	200	27.	200
Trichlorofluoromethane	ND		ug/l	500	32.	200
1,1-Dichloroethene	ND		ug/l	100	34.	200
Carbon disulfide	ND		ug/l	1000	60.	200
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	500	30.	200
Methylene chloride	ND		ug/l	500	140	200
Acetone	ND		ug/l	1000	290	200
trans-1,2-Dichloroethene	ND		ug/l	150	33.	200
Methyl Acetate	ND		ug/l	400	47.	200
Methyl tert butyl ether	ND		ug/l	200	33.	200
1,1-Dichloroethane	ND		ug/l	150	42.	200
cis-1,2-Dichloroethene	ND		ug/l	100	37.	200
1,2-Dichloroethene, Total	ND		ug/l	100	33.	200
Cyclohexane	310	J	ug/l	2000	54.	200
Bromochloromethane	ND		ug/l	500	30.	200
Chloroform	ND		ug/l	150	44.	200
Carbon tetrachloride	ND		ug/l	100	27.	200
1,1,1-Trichloroethane	ND		ug/l	100	32.	200
2-Butanone	480	J	ug/l	1000	390	200
Benzene	43000	E	ug/l	100	32.	200
1,2-Dichloroethane	ND		ug/l	100	26.	200
Methyl cyclohexane	120	J	ug/l	2000	79.	200
Trichloroethene	ND		ug/l	100	35.	200
1,2-Dichloropropane	ND		ug/l	200	27.	200

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-02 D Date Collected: 07/21/23 11:40

Client ID: S-481_20230721 Date Received: 07/21/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	100	38.	200
cis-1,3-Dichloropropene	ND		ug/l	100	29.	200
Toluene	25000		ug/l	150	41.	200
Tetrachloroethene	ND		ug/l	100	36.	200
4-Methyl-2-pentanone	ND		ug/l	1000	83.	200
trans-1,3-Dichloropropene	ND		ug/l	100	33.	200
1,3-Dichloropropene, Total	ND		ug/l	100	29.	200
1,1,2-Trichloroethane	ND		ug/l	150	29.	200
Dibromochloromethane	ND		ug/l	100	30.	200
1,2-Dibromoethane	ND		ug/l	400	39.	200
2-Hexanone	ND		ug/l	1000	100	200
Chlorobenzene	ND		ug/l	100	36.	200
Ethylbenzene	ND		ug/l	100	33.	200
p/m-Xylene	ND		ug/l	200	66.	200
o-Xylene	ND		ug/l	200	78.	200
Xylenes, Total	ND		ug/l	200	66.	200
Styrene	ND		ug/l	200	72.	200
Bromoform	ND		ug/l	400	50.	200
Isopropylbenzene	ND		ug/l	100	37.	200
1,3-Dichlorobenzene	ND		ug/l	500	37.	200
1,4-Dichlorobenzene	ND		ug/l	500	37.	200
1,2-Dichlorobenzene	ND		ug/l	500	37.	200
1,2-Dibromo-3-chloropropane	ND		ug/l	500	71.	200
1,2,4-Trichlorobenzene	ND		ug/l	500	44.	200
1,2,3-Trichlorobenzene	ND		ug/l	500	47.	200

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	96		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	88		70-130
Dibromofluoromethane	102		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-02 D
Client ID: S-481_20230721
Sample Location: FORMER PHL REFINERY

Date Collected: 07/21/23 11:40
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 08/01/23 13:59
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	600	210	200
1,1,2,2-Tetrachloroethane	ND		ug/l	10.0	1.14	200

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	96		70-130
4-Bromofluorobenzene	85		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-02 D
Client ID: S-481_20230721
Sample Location: FORMER PHL REFINERY

Date Collected: 07/21/23 11:40
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/24/23 14:15
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	13.9		mg/l	6.00	6.00	2

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-03
Client ID: S-482_20230720
Sample Location: FORMER PHL REFINERY
Date Collected: 07/20/23 15:00
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/27/23 18:28
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	301		ug/l	2.00	2.00	1	A
Ethene	0.609		ug/l	0.500	0.500	1	A
Ethane	ND		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-03 D
Client ID: S-482_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 15:00
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 08/03/23 06:28
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	25000	1200	5000
Chloromethane	ND		ug/l	12000	1000	5000
Vinyl chloride	ND		ug/l	5000	360	5000
Bromomethane	ND		ug/l	5000	1300	5000
Chloroethane	ND		ug/l	5000	670	5000
Trichlorofluoromethane	ND		ug/l	12000	800	5000
1,1-Dichloroethene	ND		ug/l	2500	840	5000
Carbon disulfide	ND		ug/l	25000	1500	5000
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	12000	740	5000
Methylene chloride	ND		ug/l	12000	3400	5000
Acetone	ND		ug/l	25000	7300	5000
trans-1,2-Dichloroethene	ND		ug/l	3800	820	5000
Methyl Acetate	ND		ug/l	10000	1200	5000
Methyl tert butyl ether	ND		ug/l	5000	830	5000
1,1-Dichloroethane	ND		ug/l	3800	1000	5000
cis-1,2-Dichloroethene	ND		ug/l	2500	940	5000
1,2-Dichloroethene, Total	ND		ug/l	2500	820	5000
Cyclohexane	ND		ug/l	50000	1400	5000
Bromochloromethane	ND		ug/l	12000	760	5000
Chloroform	ND		ug/l	3800	1100	5000
Carbon tetrachloride	ND		ug/l	2500	670	5000
1,1,1-Trichloroethane	ND		ug/l	2500	790	5000
2-Butanone	ND		ug/l	25000	9700	5000
Benzene	430000		ug/l	2500	800	5000
1,2-Dichloroethane	ND		ug/l	2500	660	5000
Methyl cyclohexane	ND		ug/l	50000	2000	5000
Trichloroethene	ND		ug/l	2500	880	5000
1,2-Dichloropropane	ND		ug/l	5000	680	5000

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-03 D Date Collected: 07/20/23 15:00

Client ID: S-482_20230720 Date Received: 07/21/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	2500	960	5000
cis-1,3-Dichloropropene	ND		ug/l	2500	720	5000
Toluene	65000		ug/l	3800	1000	5000
Tetrachloroethene	ND		ug/l	2500	900	5000
4-Methyl-2-pentanone	ND		ug/l	25000	2100	5000
trans-1,3-Dichloropropene	ND		ug/l	2500	820	5000
1,3-Dichloropropene, Total	ND		ug/l	2500	720	5000
1,1,2-Trichloroethane	ND		ug/l	3800	720	5000
Dibromochloromethane	ND		ug/l	2500	740	5000
1,2-Dibromoethane	ND		ug/l	10000	960	5000
2-Hexanone	ND		ug/l	25000	2600	5000
Chlorobenzene	ND		ug/l	2500	890	5000
Ethylbenzene	ND		ug/l	2500	840	5000
p/m-Xylene	ND		ug/l	5000	1700	5000
o-Xylene	ND		ug/l	5000	2000	5000
Xylenes, Total	ND		ug/l	5000	1700	5000
Styrene	ND		ug/l	5000	1800	5000
Bromoform	ND		ug/l	10000	1200	5000
Isopropylbenzene	ND		ug/l	2500	940	5000
1,3-Dichlorobenzene	ND		ug/l	12000	930	5000
1,4-Dichlorobenzene	ND		ug/l	12000	940	5000
1,2-Dichlorobenzene	ND		ug/l	12000	920	5000
1,2-Dibromo-3-chloropropane	ND		ug/l	12000	1800	5000
1,2,4-Trichlorobenzene	ND		ug/l	12000	1100	5000
1,2,3-Trichlorobenzene	ND		ug/l	12000	1200	5000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	109		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	105		70-130
Dibromofluoromethane	99		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-03 D
Client ID: S-482_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 15:00
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 08/03/23 06:28
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	15000	5400	5000
1,1,2,2-Tetrachloroethane	ND		ug/l	250	28.5	5000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	90		70-130
4-Bromofluorobenzene	97		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-03 D
Client ID: S-482_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 15:00
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/24/23 14:33
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	106		mg/l	6.00	6.00	2

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-04 Date Collected: 07/17/23 00:00
Client ID: TRIP BLANK Date Received: 07/21/23
Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 08/02/23 12:40
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	5.0	0.24	1
Chloromethane	ND		ug/l	2.5	0.20	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Bromomethane	ND		ug/l	1.0	0.26	1
Chloroethane	ND		ug/l	1.0	0.13	1
Trichlorofluoromethane	ND		ug/l	2.5	0.16	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
Carbon disulfide	ND		ug/l	5.0	0.30	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15	1
Methylene chloride	ND		ug/l	2.5	0.68	1
Acetone	ND		ug/l	5.0	1.5	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16	1
Methyl Acetate	ND		ug/l	2.0	0.23	1
Methyl tert butyl ether	ND		ug/l	1.0	0.17	1
1,1-Dichloroethane	ND		ug/l	0.75	0.21	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16	1
Cyclohexane	ND		ug/l	10	0.27	1
Bromochloromethane	ND		ug/l	2.5	0.15	1
Chloroform	ND		ug/l	0.75	0.22	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16	1
2-Butanone	ND		ug/l	5.0	1.9	1
Benzene	ND		ug/l	0.50	0.16	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
Methyl cyclohexane	ND		ug/l	10	0.40	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-04 Date Collected: 07/17/23 00:00

Client ID: TRIP BLANK Date Received: 07/21/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	0.50	0.19	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
Toluene	ND		ug/l	0.75	0.20	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,2-Dibromoethane	ND		ug/l	2.0	0.19	1
2-Hexanone	ND		ug/l	5.0	0.52	1
Chlorobenzene	ND		ug/l	0.50	0.18	1
Ethylbenzene	ND		ug/l	0.50	0.17	1
p/m-Xylene	ND		ug/l	1.0	0.33	1
o-Xylene	ND		ug/l	1.0	0.39	1
Xylenes, Total	ND		ug/l	1.0	0.33	1
Styrene	ND		ug/l	1.0	0.36	1
Bromoform	ND		ug/l	2.0	0.25	1
Isopropylbenzene	ND		ug/l	0.50	0.19	1
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	111		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	106		70-130
Dibromofluoromethane	101		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-04 Date Collected: 07/17/23 00:00
Client ID: TRIP BLANK Date Received: 07/21/23
Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 08/01/23 11:15
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	1.1	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	106		70-130
4-Bromofluorobenzene	84		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-05
Client ID: S-283_SL_20230721
Sample Location: FORMER PHL REFINERY
Date Collected: 07/21/23 14:35
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/27/23 19:15
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	9160		ug/l	2.00	2.00	1	A
Ethene	ND		ug/l	0.500	0.500	1	A
Ethane	ND		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-05 D
Client ID: S-283_SL_20230721
Sample Location: FORMER PHL REFINERY

Date Collected: 07/21/23 14:35
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 08/01/23 12:37
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	10000	490	2000
Chloromethane	ND		ug/l	5000	400	2000
Vinyl chloride	ND		ug/l	2000	140	2000
Bromomethane	ND		ug/l	2000	510	2000
Chloroethane	ND		ug/l	2000	270	2000
Trichlorofluoromethane	ND		ug/l	5000	320	2000
1,1-Dichloroethene	ND		ug/l	1000	340	2000
Carbon disulfide	ND		ug/l	10000	600	2000
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	5000	300	2000
Methylene chloride	ND		ug/l	5000	1400	2000
Acetone	ND		ug/l	10000	2900	2000
trans-1,2-Dichloroethene	ND		ug/l	1500	330	2000
Methyl Acetate	ND		ug/l	4000	470	2000
Methyl tert butyl ether	ND		ug/l	2000	330	2000
1,1-Dichloroethane	ND		ug/l	1500	420	2000
cis-1,2-Dichloroethene	ND		ug/l	1000	370	2000
1,2-Dichloroethene, Total	ND		ug/l	1000	330	2000
Cyclohexane	ND		ug/l	20000	540	2000
Bromochloromethane	ND		ug/l	5000	300	2000
Chloroform	ND		ug/l	1500	440	2000
Carbon tetrachloride	ND		ug/l	1000	270	2000
1,1,1-Trichloroethane	ND		ug/l	1000	320	2000
2-Butanone	ND		ug/l	10000	3900	2000
Benzene	300000		ug/l	1000	320	2000
1,2-Dichloroethane	ND		ug/l	1000	260	2000
Methyl cyclohexane	ND		ug/l	20000	790	2000
Trichloroethene	ND		ug/l	1000	350	2000
1,2-Dichloropropane	ND		ug/l	2000	270	2000

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-05 D Date Collected: 07/21/23 14:35

Client ID: S-283_SL_20230721 Date Received: 07/21/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	1000	380	2000
cis-1,3-Dichloropropene	ND		ug/l	1000	290	2000
Toluene	51000		ug/l	1500	410	2000
Tetrachloroethene	ND		ug/l	1000	360	2000
4-Methyl-2-pentanone	ND		ug/l	10000	830	2000
trans-1,3-Dichloropropene	ND		ug/l	1000	330	2000
1,3-Dichloropropene, Total	ND		ug/l	1000	290	2000
1,1,2-Trichloroethane	ND		ug/l	1500	290	2000
Dibromochloromethane	ND		ug/l	1000	300	2000
1,2-Dibromoethane	ND		ug/l	4000	390	2000
2-Hexanone	ND		ug/l	10000	1000	2000
Chlorobenzene	ND		ug/l	1000	360	2000
Ethylbenzene	ND		ug/l	1000	330	2000
p/m-Xylene	ND		ug/l	2000	660	2000
o-Xylene	ND		ug/l	2000	780	2000
Xylenes, Total	ND		ug/l	2000	660	2000
Styrene	ND		ug/l	2000	720	2000
Bromoform	ND		ug/l	4000	500	2000
Isopropylbenzene	ND		ug/l	1000	370	2000
1,3-Dichlorobenzene	ND		ug/l	5000	370	2000
1,4-Dichlorobenzene	ND		ug/l	5000	370	2000
1,2-Dichlorobenzene	ND		ug/l	5000	370	2000
1,2-Dibromo-3-chloropropane	ND		ug/l	5000	710	2000
1,2,4-Trichlorobenzene	ND		ug/l	5000	440	2000
1,2,3-Trichlorobenzene	ND		ug/l	5000	470	2000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	98		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	86		70-130
Dibromofluoromethane	104		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-05 D
Client ID: S-283_SL_20230721
Sample Location: FORMER PHL REFINERY

Date Collected: 07/21/23 14:35
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 08/01/23 12:37
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	6000	2100	2000
1,1,2,2-Tetrachloroethane	ND		ug/l	100	11.4	2000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	99		70-130
4-Bromofluorobenzene	84		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-05 D
Client ID: S-283_SL_20230721
Sample Location: FORMER PHL REFINERY

Date Collected: 07/21/23 14:35
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/24/23 14:51
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	61.0		mg/l	6.00	6.00	2

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-06
Client ID: S-382_SL_20230721
Sample Location: FORMER PHL REFINERY
Date Collected: 07/21/23 14:45
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/28/23 16:05
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	386		ug/l	2.00	2.00	1	A
Ethene	ND		ug/l	0.500	0.500	1	A
Ethane	0.506		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-06 D
Client ID: S-382_SL_20230721
Sample Location: FORMER PHL REFINERY

Date Collected: 07/21/23 14:45
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 08/03/23 06:52
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	10000	490	2000
Chloromethane	ND		ug/l	5000	400	2000
Vinyl chloride	ND		ug/l	2000	140	2000
Bromomethane	ND		ug/l	2000	510	2000
Chloroethane	ND		ug/l	2000	270	2000
Trichlorofluoromethane	ND		ug/l	5000	320	2000
1,1-Dichloroethene	ND		ug/l	1000	340	2000
Carbon disulfide	ND		ug/l	10000	600	2000
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	5000	300	2000
Methylene chloride	ND		ug/l	5000	1400	2000
Acetone	ND		ug/l	10000	2900	2000
trans-1,2-Dichloroethene	ND		ug/l	1500	330	2000
Methyl Acetate	ND		ug/l	4000	470	2000
Methyl tert butyl ether	ND		ug/l	2000	330	2000
1,1-Dichloroethane	ND		ug/l	1500	420	2000
cis-1,2-Dichloroethene	ND		ug/l	1000	370	2000
1,2-Dichloroethene, Total	ND		ug/l	1000	330	2000
Cyclohexane	820	J	ug/l	20000	540	2000
Bromochloromethane	ND		ug/l	5000	300	2000
Chloroform	ND		ug/l	1500	440	2000
Carbon tetrachloride	ND		ug/l	1000	270	2000
1,1,1-Trichloroethane	ND		ug/l	1000	320	2000
2-Butanone	ND		ug/l	10000	3900	2000
Benzene	200000		ug/l	1000	320	2000
1,2-Dichloroethane	ND		ug/l	1000	260	2000
Methyl cyclohexane	ND		ug/l	20000	790	2000
Trichloroethene	ND		ug/l	1000	350	2000
1,2-Dichloropropane	ND		ug/l	2000	270	2000

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-06 D Date Collected: 07/21/23 14:45

Client ID: S-382_SL_20230721 Date Received: 07/21/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	1000	380	2000
cis-1,3-Dichloropropene	ND		ug/l	1000	290	2000
Toluene	69000		ug/l	1500	410	2000
Tetrachloroethene	ND		ug/l	1000	360	2000
4-Methyl-2-pentanone	ND		ug/l	10000	830	2000
trans-1,3-Dichloropropene	ND		ug/l	1000	330	2000
1,3-Dichloropropene, Total	ND		ug/l	1000	290	2000
1,1,2-Trichloroethane	ND		ug/l	1500	290	2000
Dibromochloromethane	ND		ug/l	1000	300	2000
1,2-Dibromoethane	ND		ug/l	4000	390	2000
2-Hexanone	ND		ug/l	10000	1000	2000
Chlorobenzene	ND		ug/l	1000	360	2000
Ethylbenzene	ND		ug/l	1000	330	2000
p/m-Xylene	ND		ug/l	2000	660	2000
o-Xylene	ND		ug/l	2000	780	2000
Xylenes, Total	ND		ug/l	2000	660	2000
Styrene	ND		ug/l	2000	720	2000
Bromoform	ND		ug/l	4000	500	2000
Isopropylbenzene	ND		ug/l	1000	370	2000
1,3-Dichlorobenzene	ND		ug/l	5000	370	2000
1,4-Dichlorobenzene	ND		ug/l	5000	370	2000
1,2-Dichlorobenzene	ND		ug/l	5000	370	2000
1,2-Dibromo-3-chloropropane	ND		ug/l	5000	710	2000
1,2,4-Trichlorobenzene	ND		ug/l	5000	440	2000
1,2,3-Trichlorobenzene	ND		ug/l	5000	470	2000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	110		70-130
Toluene-d8	95		70-130
4-Bromofluorobenzene	108		70-130
Dibromofluoromethane	99		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-06 D
Client ID: S-382_SL_20230721
Sample Location: FORMER PHL REFINERY

Date Collected: 07/21/23 14:45
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 08/03/23 06:52
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	6000	2100	2000
1,1,2,2-Tetrachloroethane	ND		ug/l	100	11.4	2000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	90		70-130
4-Bromofluorobenzene	97		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-06 D
Client ID: S-382_SL_20230721
Sample Location: FORMER PHL REFINERY

Date Collected: 07/21/23 14:45
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/24/23 15:09
Analyst: BJB

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	43.6		mg/l	6.00	6.00	2

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2342282
Report Date: 08/11/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 117,-
Analytical Date: 07/24/23 08:49
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL
Dissolved Gases by GC - Mansfield Lab for sample(s): 01-03,05-06 Batch: WG1806862-3					
Carbon Dioxide	ND		mg/l	3.00	3.00

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 117,-
Analytical Date: 07/27/23 09:15
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	
Dissolved Gases by GC - Mansfield Lab for sample(s): 01,03,05 Batch: WG1808379-3						
Methane	ND		ug/l	2.00	2.00	A
Ethene	ND		ug/l	0.500	0.500	A
Ethane	ND		ug/l	0.500	0.500	A

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2342282
Report Date: 08/11/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 117,-
Analytical Date: 07/28/23 12:42
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	
Dissolved Gases by GC - Mansfield Lab for sample(s): 06 Batch: WG1808956-3						
Methane	ND		ug/l	2.00	2.00	A
Ethene	ND		ug/l	0.500	0.500	A
Ethane	ND		ug/l	0.500	0.500	A

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2342282
Report Date: 08/11/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 117,-
Analytical Date: 07/31/23 08:35
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	
Dissolved Gases by GC - Mansfield Lab for sample(s): 02 Batch: WG1809753-3						
Methane	ND		ug/l	2.00	2.00	A
Ethene	ND		ug/l	0.500	0.500	A
Ethane	ND		ug/l	0.500	0.500	A

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 08/01/23 06:42
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02,05 Batch: WG1810258-5					
Dichlorodifluoromethane	ND		ug/l	5.0	0.24
Chloromethane	ND		ug/l	2.5	0.20
Vinyl chloride	ND		ug/l	1.0	0.07
Bromomethane	ND		ug/l	1.0	0.26
Chloroethane	ND		ug/l	1.0	0.13
Trichlorofluoromethane	ND		ug/l	2.5	0.16
1,1-Dichloroethene	ND		ug/l	0.50	0.17
Carbon disulfide	ND		ug/l	5.0	0.30
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15
Methylene chloride	ND		ug/l	2.5	0.68
Acetone	ND		ug/l	5.0	1.5
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16
Methyl Acetate	ND		ug/l	2.0	0.23
Methyl tert butyl ether	ND		ug/l	1.0	0.17
1,1-Dichloroethane	ND		ug/l	0.75	0.21
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16
Cyclohexane	ND		ug/l	10	0.27
Bromochloromethane	ND		ug/l	2.5	0.15
Chloroform	ND		ug/l	0.75	0.22
Carbon tetrachloride	ND		ug/l	0.50	0.13
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16
2-Butanone	ND		ug/l	5.0	1.9
Benzene	ND		ug/l	0.50	0.16
1,2-Dichloroethane	ND		ug/l	0.50	0.13
Methyl cyclohexane	ND		ug/l	10	0.40
Trichloroethene	ND		ug/l	0.50	0.18
1,2-Dichloropropane	ND		ug/l	1.0	0.14
Bromodichloromethane	ND		ug/l	0.50	0.19

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 08/01/23 06:42
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02,05 Batch: WG1810258-5					
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14
Toluene	ND		ug/l	0.75	0.20
Tetrachloroethene	ND		ug/l	0.50	0.18
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14
Dibromochloromethane	ND		ug/l	0.50	0.15
1,2-Dibromoethane	ND		ug/l	2.0	0.19
2-Hexanone	ND		ug/l	5.0	0.52
Chlorobenzene	ND		ug/l	0.50	0.18
Ethylbenzene	ND		ug/l	0.50	0.17
p/m-Xylene	ND		ug/l	1.0	0.33
o-Xylene	ND		ug/l	1.0	0.39
Xylenes, Total	ND		ug/l	1.0	0.33
Styrene	ND		ug/l	1.0	0.36
Bromoform	ND		ug/l	2.0	0.25
Isopropylbenzene	ND		ug/l	0.50	0.19
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 08/01/23 06:42
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02,05 Batch: WG1810258-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	111		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	88		70-130
Dibromofluoromethane	111		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D-SIM(M)
Analytical Date: 08/01/23 06:42
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 02,04-05 Batch: WG1810270-5					
1,4-Dioxane	ND		ug/l	3.0	1.1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	107		70-130
4-Bromofluorobenzene	86		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 08/02/23 07:19
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02,04 Batch: WG1811352-5					
Dichlorodifluoromethane	ND		ug/l	5.0	0.24
Chloromethane	ND		ug/l	2.5	0.20
Vinyl chloride	ND		ug/l	1.0	0.07
Bromomethane	ND		ug/l	1.0	0.26
Chloroethane	ND		ug/l	1.0	0.13
Trichlorofluoromethane	ND		ug/l	2.5	0.16
1,1-Dichloroethene	ND		ug/l	0.50	0.17
Carbon disulfide	ND		ug/l	5.0	0.30
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15
Methylene chloride	ND		ug/l	2.5	0.68
Acetone	ND		ug/l	5.0	1.5
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16
Methyl Acetate	ND		ug/l	2.0	0.23
Methyl tert butyl ether	ND		ug/l	1.0	0.17
1,1-Dichloroethane	ND		ug/l	0.75	0.21
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16
Cyclohexane	ND		ug/l	10	0.27
Bromochloromethane	ND		ug/l	2.5	0.15
Chloroform	ND		ug/l	0.75	0.22
Carbon tetrachloride	ND		ug/l	0.50	0.13
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16
2-Butanone	ND		ug/l	5.0	1.9
Benzene	ND		ug/l	0.50	0.16
1,2-Dichloroethane	ND		ug/l	0.50	0.13
Methyl cyclohexane	ND		ug/l	10	0.40
Trichloroethene	ND		ug/l	0.50	0.18
1,2-Dichloropropane	ND		ug/l	1.0	0.14
Bromodichloromethane	ND		ug/l	0.50	0.19

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 08/02/23 07:19
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02,04 Batch: WG1811352-5					
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14
Toluene	ND		ug/l	0.75	0.20
Tetrachloroethene	ND		ug/l	0.50	0.18
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14
Dibromochloromethane	ND		ug/l	0.50	0.15
1,2-Dibromoethane	ND		ug/l	2.0	0.19
2-Hexanone	ND		ug/l	5.0	0.52
Chlorobenzene	ND		ug/l	0.50	0.18
Ethylbenzene	ND		ug/l	0.50	0.17
p/m-Xylene	ND		ug/l	1.0	0.33
o-Xylene	ND		ug/l	1.0	0.39
Xylenes, Total	ND		ug/l	1.0	0.33
Styrene	ND		ug/l	1.0	0.36
Bromoform	ND		ug/l	2.0	0.25
Isopropylbenzene	ND		ug/l	0.50	0.19
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2342282
Report Date: 08/11/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 08/02/23 07:19
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02,04 Batch: WG1811352-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	113		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	106		70-130
Dibromofluoromethane	102		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 08/03/23 06:03
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01,03,06 Batch: WG1811748-5					
Dichlorodifluoromethane	ND		ug/l	5.0	0.24
Chloromethane	ND		ug/l	2.5	0.20
Vinyl chloride	ND		ug/l	1.0	0.07
Bromomethane	ND		ug/l	1.0	0.26
Chloroethane	ND		ug/l	1.0	0.13
Trichlorofluoromethane	ND		ug/l	2.5	0.16
1,1-Dichloroethene	ND		ug/l	0.50	0.17
Carbon disulfide	ND		ug/l	5.0	0.30
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15
Methylene chloride	ND		ug/l	2.5	0.68
Acetone	ND		ug/l	5.0	1.5
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16
Methyl Acetate	ND		ug/l	2.0	0.23
Methyl tert butyl ether	ND		ug/l	1.0	0.17
1,1-Dichloroethane	ND		ug/l	0.75	0.21
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16
Cyclohexane	ND		ug/l	10	0.27
Bromochloromethane	ND		ug/l	2.5	0.15
Chloroform	ND		ug/l	0.75	0.22
Carbon tetrachloride	ND		ug/l	0.50	0.13
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16
2-Butanone	ND		ug/l	5.0	1.9
Benzene	ND		ug/l	0.50	0.16
1,2-Dichloroethane	ND		ug/l	0.50	0.13
Methyl cyclohexane	ND		ug/l	10	0.40
Trichloroethene	ND		ug/l	0.50	0.18
1,2-Dichloropropane	ND		ug/l	1.0	0.14
Bromodichloromethane	ND		ug/l	0.50	0.19

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 08/03/23 06:03
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01,03,06 Batch: WG1811748-5					
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14
Toluene	ND		ug/l	0.75	0.20
Tetrachloroethene	ND		ug/l	0.50	0.18
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14
Dibromochloromethane	ND		ug/l	0.50	0.15
1,2-Dibromoethane	ND		ug/l	2.0	0.19
2-Hexanone	ND		ug/l	5.0	0.52
Chlorobenzene	ND		ug/l	0.50	0.18
Ethylbenzene	ND		ug/l	0.50	0.17
p/m-Xylene	ND		ug/l	1.0	0.33
o-Xylene	ND		ug/l	1.0	0.39
Xylenes, Total	ND		ug/l	1.0	0.33
Styrene	ND		ug/l	1.0	0.36
Bromoform	ND		ug/l	2.0	0.25
Isopropylbenzene	ND		ug/l	0.50	0.19
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 08/03/23 06:03
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01,03,06 Batch: WG1811748-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	110		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	106		70-130
Dibromofluoromethane	101		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D-SIM(M)
Analytical Date: 08/03/23 06:03
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01,03,06 Batch: WG1811750-5					
1,4-Dioxane	ND		ug/l	3.0	1.1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	90		70-130
4-Bromofluorobenzene	97		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342282

Report Date: 08/11/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Dissolved Gases by GC - Mansfield Lab	Associated sample(s): 01-03,05-06		Batch: WG1806862-2					
Carbon Dioxide	95		-		80-120	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342282

Report Date: 08/11/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Dissolved Gases by GC - Mansfield Lab Associated sample(s): 01,03,05 Batch: WG1808379-2									
Methane	108		-		80-120	-		25	A
Ethene	102		-		80-120	-		25	A
Ethane	102		-		80-120	-		25	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342282

Report Date: 08/11/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Dissolved Gases by GC - Mansfield Lab Associated sample(s): 06 Batch: WG1808956-2									
Methane	113		-		80-120	-		25	A
Ethene	108		-		80-120	-		25	A
Ethane	107		-		80-120	-		25	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342282

Report Date: 08/11/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Dissolved Gases by GC - Mansfield Lab Associated sample(s): 02 Batch: WG1809753-2									
Methane	93		-		80-120	-		25	A
Ethene	86		-		80-120	-		25	A
Ethane	90		-		80-120	-		25	A

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342282
Report Date: 08/11/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02,05 Batch: WG1810258-3 WG1810258-4								
Dichlorodifluoromethane	130		130		36-147	0		20
Chloromethane	120		120		64-130	0		20
Vinyl chloride	120		120		55-140	0		20
Bromomethane	93		100		39-139	7		20
Chloroethane	70		71		55-138	1		20
Trichlorofluoromethane	110		110		62-150	0		20
1,1-Dichloroethene	110		110		61-145	0		20
Carbon disulfide	120		110		51-130	9		20
1,1,2-Trichloro-1,2,2-Trifluoroethane	120		120		70-130	0		20
Methylene chloride	110		100		70-130	10		20
Acetone	130		130		58-148	0		20
trans-1,2-Dichloroethene	110		110		70-130	0		20
Methyl Acetate	120		120		70-130	0		20
Methyl tert butyl ether	120		120		63-130	0		20
1,1-Dichloroethane	120		110		70-130	9		20
cis-1,2-Dichloroethene	110		110		70-130	0		20
Cyclohexane	110		110		70-130	0		20
Bromochloromethane	110		110		70-130	0		20
Chloroform	110		110		70-130	0		20
Carbon tetrachloride	110		110		63-132	0		20
1,1,1-Trichloroethane	120		120		67-130	0		20
2-Butanone	110		110		63-138	0		20
Benzene	110		110		70-130	0		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342282
Report Date: 08/11/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02,05 Batch: WG1810258-3 WG1810258-4								
1,2-Dichloroethane	120		120		70-130	0		20
Methyl cyclohexane	110		110		70-130	0		20
Trichloroethene	110		110		70-130	0		20
1,2-Dichloropropane	110		100		70-130	10		20
Bromodichloromethane	110		100		67-130	10		20
cis-1,3-Dichloropropene	110		100		70-130	10		20
Toluene	110		110		70-130	0		20
Tetrachloroethene	120		120		70-130	0		20
4-Methyl-2-pentanone	86		90		59-130	5		20
trans-1,3-Dichloropropene	110		100		70-130	10		20
1,1,2-Trichloroethane	110		110		70-130	0		20
Dibromochloromethane	110		110		63-130	0		20
1,2-Dibromoethane	110		110		70-130	0		20
2-Hexanone	98		96		57-130	2		20
Chlorobenzene	100		100		75-130	0		20
Ethylbenzene	110		100		70-130	10		20
p/m-Xylene	105		105		70-130	0		20
o-Xylene	105		100		70-130	5		20
Styrene	105		100		70-130	5		20
Bromoform	96		92		54-136	4		20
Isopropylbenzene	100		97		70-130	3		20
1,3-Dichlorobenzene	100		100		70-130	0		20
1,4-Dichlorobenzene	100		100		70-130	0		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342282

Report Date: 08/11/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02,05 Batch: WG1810258-3 WG1810258-4								
1,2-Dichlorobenzene	100		100		70-130	0		20
1,2-Dibromo-3-chloropropane	96		94		41-144	2		20
1,2,4-Trichlorobenzene	110		110		70-130	0		20
1,2,3-Trichlorobenzene	110		110		70-130	0		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	104		98		70-130
Toluene-d8	98		98		70-130
4-Bromofluorobenzene	89		87		70-130
Dibromofluoromethane	101		101		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342282

Report Date: 08/11/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 02,04-05 Batch: WG1810270-3 WG1810270-4								
1,4-Dioxane	130		84		70-130	**43**	Q	25
1,1,2,2-Tetrachloroethane	101		107		70-130	6		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	107		107		70-130
4-Bromofluorobenzene	86		86		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342282

Report Date: 08/11/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02,04 Batch: WG1811352-3 WG1811352-4								
Dichlorodifluoromethane	86		87		36-147	1		20
Chloromethane	92		92		64-130	0		20
Vinyl chloride	76		76		55-140	0		20
Bromomethane	64		67		39-139	5		20
Chloroethane	70		71		55-138	1		20
Trichlorofluoromethane	66		66		62-150	0		20
1,1-Dichloroethene	97		100		61-145	3		20
Carbon disulfide	100		100		51-130	0		20
1,1,2-Trichloro-1,2,2-Trifluoroethane	100		100		70-130	0		20
Methylene chloride	94		94		70-130	0		20
Acetone	95		96		58-148	1		20
trans-1,2-Dichloroethene	98		99		70-130	1		20
Methyl Acetate	100		100		70-130	0		20
Methyl tert butyl ether	96		96		63-130	0		20
1,1-Dichloroethane	100		100		70-130	0		20
cis-1,2-Dichloroethene	99		97		70-130	2		20
Cyclohexane	110		110		70-130	0		20
Bromochloromethane	96		98		70-130	2		20
Chloroform	100		100		70-130	0		20
Carbon tetrachloride	100		110		63-132	10		20
1,1,1-Trichloroethane	100		100		67-130	0		20
2-Butanone	100		100		63-138	0		20
Benzene	100		100		70-130	0		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342282
Report Date: 08/11/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02,04 Batch: WG1811352-3 WG1811352-4								
1,2-Dichloroethane	100		100		70-130	0		20
Methyl cyclohexane	99		100		70-130	1		20
Trichloroethene	92		93		70-130	1		20
1,2-Dichloropropane	96		98		70-130	2		20
Bromodichloromethane	99		100		67-130	1		20
cis-1,3-Dichloropropene	100		100		70-130	0		20
Toluene	96		95		70-130	1		20
Tetrachloroethene	95		94		70-130	1		20
4-Methyl-2-pentanone	91		91		59-130	0		20
trans-1,3-Dichloropropene	100		100		70-130	0		20
1,1,2-Trichloroethane	94		90		70-130	4		20
Dibromochloromethane	92		91		63-130	1		20
1,2-Dibromoethane	92		91		70-130	1		20
2-Hexanone	89		87		57-130	2		20
Chlorobenzene	93		93		75-130	0		20
Ethylbenzene	97		96		70-130	1		20
p/m-Xylene	95		95		70-130	0		20
o-Xylene	90		90		70-130	0		20
Styrene	90		90		70-130	0		20
Bromoform	86		87		54-136	1		20
Isopropylbenzene	100		100		70-130	0		20
1,3-Dichlorobenzene	90		90		70-130	0		20
1,4-Dichlorobenzene	91		89		70-130	2		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342282

Report Date: 08/11/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02,04 Batch: WG1811352-3 WG1811352-4								
1,2-Dichlorobenzene	89		88		70-130	1		20
1,2-Dibromo-3-chloropropane	79		78		41-144	1		20
1,2,4-Trichlorobenzene	90		90		70-130	0		20
1,2,3-Trichlorobenzene	88		86		70-130	2		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	99		100		70-130
Toluene-d8	99		98		70-130
4-Bromofluorobenzene	107		106		70-130
Dibromofluoromethane	100		99		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342282
Report Date: 08/11/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01,03,06 Batch: WG1811748-3 WG1811748-4								
Dichlorodifluoromethane	90		90		36-147	0		20
Chloromethane	94		96		64-130	2		20
Vinyl chloride	78		79		55-140	1		20
Bromomethane	80		79		39-139	1		20
Chloroethane	72		73		55-138	1		20
Trichlorofluoromethane	67		67		62-150	0		20
1,1-Dichloroethene	100		100		61-145	0		20
Carbon disulfide	100		100		51-130	0		20
1,1,2-Trichloro-1,2,2-Trifluoroethane	100		100		70-130	0		20
Methylene chloride	97		97		70-130	0		20
Acetone	92		93		58-148	1		20
trans-1,2-Dichloroethene	100		100		70-130	0		20
Methyl Acetate	110		110		70-130	0		20
Methyl tert butyl ether	97		98		63-130	1		20
1,1-Dichloroethane	110		110		70-130	0		20
cis-1,2-Dichloroethene	100		100		70-130	0		20
Cyclohexane	110		110		70-130	0		20
Bromochloromethane	100		100		70-130	0		20
Chloroform	100		100		70-130	0		20
Carbon tetrachloride	110		110		63-132	0		20
1,1,1-Trichloroethane	100		100		67-130	0		20
2-Butanone	110		100		63-138	10		20
Benzene	100		100		70-130	0		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342282
Report Date: 08/11/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01,03,06 Batch: WG1811748-3 WG1811748-4								
1,2-Dichloroethane	100		100		70-130	0		20
Methyl cyclohexane	100		100		70-130	0		20
Trichloroethene	91		92		70-130	1		20
1,2-Dichloropropane	100		100		70-130	0		20
Bromodichloromethane	100		100		67-130	0		20
cis-1,3-Dichloropropene	100		100		70-130	0		20
Toluene	99		97		70-130	2		20
Tetrachloroethene	96		96		70-130	0		20
4-Methyl-2-pentanone	92		93		59-130	1		20
trans-1,3-Dichloropropene	100		100		70-130	0		20
1,1,2-Trichloroethane	94		94		70-130	0		20
Dibromochloromethane	93		92		63-130	1		20
1,2-Dibromoethane	93		93		70-130	0		20
2-Hexanone	86		87		57-130	1		20
Chlorobenzene	95		94		75-130	1		20
Ethylbenzene	98		97		70-130	1		20
p/m-Xylene	95		95		70-130	0		20
o-Xylene	95		90		70-130	5		20
Styrene	90		90		70-130	0		20
Bromoform	84		85		54-136	1		20
Isopropylbenzene	100		100		70-130	0		20
1,3-Dichlorobenzene	90		90		70-130	0		20
1,4-Dichlorobenzene	91		89		70-130	2		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342282

Report Date: 08/11/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01,03,06 Batch: WG1811748-3 WG1811748-4								
1,2-Dichlorobenzene	88		88		70-130	0		20
1,2-Dibromo-3-chloropropane	80		82		41-144	2		20
1,2,4-Trichlorobenzene	90		90		70-130	0		20
1,2,3-Trichlorobenzene	87		86		70-130	1		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	99		100		70-130
Toluene-d8	98		97		70-130
4-Bromofluorobenzene	106		104		70-130
Dibromofluoromethane	100		99		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342282

Report Date: 08/11/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01,03,06 Batch: WG1811750-3 WG1811750-4								
1,4-Dioxane	91		90		70-130	1		25
1,1,2,2-Tetrachloroethane	104		103		70-130	1		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	90		91		70-130
4-Bromofluorobenzene	98		98		70-130

PETROLEUM HYDROCARBONS

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-01
Client ID: S-480_SL_20230724
Sample Location: FORMER PHL REFINERY

Date Collected: 07/21/23 12:10
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/28/23 07:25
Analyst: MTC

Extraction Method: EPA 3510C
Extraction Date: 07/27/23 11:14

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	3210		ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	50		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-01
Client ID: S-480_SL_20230724
Sample Location: FORMER PHL REFINERY
Date Collected: 07/21/23 12:10
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 08/01/23 12:20
Analyst: BAD
Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	1500		ug/l	50	3.0	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	109		70-130
4-Bromofluorobenzene	93		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-02
Client ID: S-481_20230721
Sample Location: FORMER PHL REFINERY

Date Collected: 07/21/23 11:40
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/28/23 08:00
Analyst: MTC

Extraction Method: EPA 3510C
Extraction Date: 07/27/23 11:14

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	378	J	ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	59		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-02 D
Client ID: S-481_20230721
Sample Location: FORMER PHL REFINERY

Date Collected: 07/21/23 11:40
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 08/01/23 13:52
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	73000		ug/l	5000	300	100

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	112		70-130
4-Bromofluorobenzene	114		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-03
Client ID: S-482_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 15:00
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/27/23 21:33
Analyst: MTC

Extraction Method: EPA 3510C
Extraction Date: 07/26/23 21:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	1040		ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	57		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-03 D
Client ID: S-482_20230720
Sample Location: FORMER PHL REFINERY

Date Collected: 07/20/23 15:00
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 08/02/23 13:47
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	520000		ug/l	50000	3000	1000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	100		70-130
4-Bromofluorobenzene	95		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-05
Client ID: S-283_SL_20230721
Sample Location: FORMER PHL REFINERY

Date Collected: 07/21/23 14:35
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/28/23 09:10
Analyst: MTC

Extraction Method: EPA 3510C
Extraction Date: 07/27/23 11:14

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	12100		ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	62		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-05 D
Client ID: S-283_SL_20230721
Sample Location: FORMER PHL REFINERY

Date Collected: 07/21/23 14:35
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 08/02/23 14:18
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	440000		ug/l	50000	3000	1000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	109		70-130
4-Bromofluorobenzene	103		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-06
Client ID: S-382_SL_20230721
Sample Location: FORMER PHL REFINERY

Date Collected: 07/21/23 14:45
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/28/23 08:35
Analyst: MTC

Extraction Method: EPA 3510C
Extraction Date: 07/27/23 11:14

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	2110		ug/l	500	86.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	50		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-06 D
Client ID: S-382_SL_20230721
Sample Location: FORMER PHL REFINERY

Date Collected: 07/21/23 14:45
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 08/02/23 14:48
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	280000		ug/l	50000	3000	1000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	110		70-130
4-Bromofluorobenzene	103		70-130

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2342282
Report Date: 08/11/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 07/27/23 16:51
Analyst: MTC

Extraction Method: EPA 3510C
Extraction Date: 07/26/23 21:46

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 01-03,05-06 Batch: WG1808209-1					
TPH (C9-C44)	151	J	ug/l	500	86.2

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	66		40-140

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2342282
Report Date: 08/11/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 08/02/23 13:16
Analyst: BAD

Parameter	Result	Qualifier	Units	RL	MDL
Gasoline Range Organics - Westborough Lab for sample(s): 03,05-06 Batch: WG1811407-10					
Gasoline Range Organics	14	J	ug/l	50	3.0

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	111		70-130
4-Bromofluorobenzene	103		70-130

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2342282
Report Date: 08/11/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 08/01/23 11:05
Analyst: BAD

Parameter	Result	Qualifier	Units	RL	MDL
Gasoline Range Organics - Westborough Lab for sample(s): 01-02 Batch: WG1811407-4					
Gasoline Range Organics	16	J	ug/l	50	3.0

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	112		70-130
4-Bromofluorobenzene	107		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342282

Report Date: 08/11/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01-03,05-06 Batch: WG1808209-2								
TPH (C9-C44)	71		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	73				40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342282

Report Date: 08/11/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Gasoline Range Organics - Westborough Lab	Associated sample(s): 01-02		Batch: WG1811407-2		WG1811407-3			
Gasoline Range Organics	95		100		80-120	5		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,1,1-Trifluorotoluene	108		112		70-130
4-Bromofluorobenzene	104		111		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342282

Report Date: 08/11/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Gasoline Range Organics - Westborough Lab	Associated sample(s): 03,05-06		Batch: WG1811407-8 WG1811407-9					
Gasoline Range Organics	94		96		80-120	2		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,1,1-Trifluorotoluene	105		109		70-130
4-Bromofluorobenzene	103		105		70-130

Matrix Spike Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342282

Report Date: 08/11/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Gasoline Range Organics - Westborough Lab Associated sample(s): 01-03,05-06 QC Batch ID: WG1811407-6 QC Sample: L2342282-01 Client ID: S-480_SL_20230724												
Gasoline Range Organics	1500	400	2000	**137**	Q	-	-		80-120	-		20

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	81				70-130
4-Bromofluorobenzene	96				70-130

Lab Duplicate Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342282
Report Date: 08/11/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Gasoline Range Organics - Westborough Lab Associated sample(s): 01-03,05-06 QC Batch ID: WG1811407-5 QC Sample: L2342282-01 Client ID: S-480_SL_20230724						
Gasoline Range Organics	1500	1700	ug/l	13		20

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	109		85		70-130
4-Bromofluorobenzene	93		107		70-130

METALS

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-01 Date Collected: 07/21/23 12:10

Client ID: S-480_SL_20230724 Date Received: 07/21/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	23400		ug/l	100.	35.0	1	07/25/23 15:53	08/10/23 19:33	EPA 3005A	1,6010D	MRC
Iron, Total	49200		ug/l	50.0	9.00	1	07/25/23 15:53	08/10/23 19:33	EPA 3005A	1,6010D	MRC
Magnesium, Total	43100		ug/l	100.	15.3	1	07/25/23 15:53	08/10/23 19:33	EPA 3005A	1,6010D	MRC
Potassium, Total	35700		ug/l	2500	237.	1	07/25/23 15:53	08/10/23 19:33	EPA 3005A	1,6010D	MRC
Sodium, Total	93600		ug/l	2000	120.	1	07/25/23 15:53	08/10/23 19:33	EPA 3005A	1,6010D	MRC

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-02
Client ID: S-481_20230721
Sample Location: FORMER PHL REFINERY
Date Collected: 07/21/23 11:40
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	17700		ug/l	100.	35.0	1	07/25/23 15:53	08/10/23 19:36	EPA 3005A	1,6010D	MRC
Iron, Total	2380		ug/l	50.0	9.00	1	07/25/23 15:53	08/10/23 19:36	EPA 3005A	1,6010D	MRC
Magnesium, Total	3040		ug/l	100.	15.3	1	07/25/23 15:53	08/10/23 19:36	EPA 3005A	1,6010D	MRC
Potassium, Total	2270	J	ug/l	2500	237.	1	07/25/23 15:53	08/10/23 19:36	EPA 3005A	1,6010D	MRC
Sodium, Total	19600		ug/l	2000	120.	1	07/25/23 15:53	08/10/23 19:36	EPA 3005A	1,6010D	MRC

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-03
Client ID: S-482_20230720
Sample Location: FORMER PHL REFINERY
Date Collected: 07/20/23 15:00
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	59200		ug/l	100.	35.0	1	07/25/23 15:53	08/10/23 19:40	EPA 3005A	1,6010D	MRC
Iron, Total	7020		ug/l	50.0	9.00	1	07/25/23 15:53	08/10/23 19:40	EPA 3005A	1,6010D	MRC
Magnesium, Total	20100		ug/l	100.	15.3	1	07/25/23 15:53	08/10/23 19:40	EPA 3005A	1,6010D	MRC
Potassium, Total	25900		ug/l	2500	237.	1	07/25/23 15:53	08/10/23 19:40	EPA 3005A	1,6010D	MRC
Sodium, Total	195000		ug/l	2000	120.	1	07/25/23 15:53	08/10/23 19:40	EPA 3005A	1,6010D	MRC

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-05
Client ID: S-283_SL_20230721
Sample Location: FORMER PHL REFINERY
Date Collected: 07/21/23 14:35
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	36400		ug/l	100.	35.0	1	07/25/23 15:53	08/10/23 19:43	EPA 3005A	1,6010D	MRC
Iron, Total	21500		ug/l	50.0	9.00	1	07/25/23 15:53	08/10/23 19:43	EPA 3005A	1,6010D	MRC
Magnesium, Total	11400		ug/l	100.	15.3	1	07/25/23 15:53	08/10/23 19:43	EPA 3005A	1,6010D	MRC
Potassium, Total	6190		ug/l	2500	237.	1	07/25/23 15:53	08/10/23 19:43	EPA 3005A	1,6010D	MRC
Sodium, Total	22600		ug/l	2000	120.	1	07/25/23 15:53	08/10/23 19:43	EPA 3005A	1,6010D	MRC

Project Name: PESRM UDEX RELEASE
Lab Number: L2342282
Project Number: 213403039
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-06
Client ID: S-382_SL_20230721
Sample Location: FORMER PHL REFINERY
Date Collected: 07/21/23 14:45
Date Received: 07/21/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	40200		ug/l	100.	35.0	1	07/25/23 15:53	08/10/23 20:09	EPA 3005A	1,6010D	MRC
Iron, Total	26900		ug/l	50.0	9.00	1	07/25/23 15:53	08/10/23 20:09	EPA 3005A	1,6010D	MRC
Magnesium, Total	9010		ug/l	100.	15.3	1	07/25/23 15:53	08/10/23 20:09	EPA 3005A	1,6010D	MRC
Potassium, Total	1850	J	ug/l	2500	237.	1	07/25/23 15:53	08/10/23 20:09	EPA 3005A	1,6010D	MRC
Sodium, Total	61900		ug/l	2000	120.	1	07/25/23 15:53	08/10/23 20:09	EPA 3005A	1,6010D	MRC

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342282

Project Number: 213403039 **Report Date:** 08/11/23

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-03,05-06 Batch: WG1807431-1										
Calcium, Total	ND		ug/l	100	35.0	1	07/25/23 15:53	08/09/23 09:26	1,6010D	JMF
Iron, Total	ND		ug/l	50.0	9.00	1	07/25/23 15:53	08/09/23 09:26	1,6010D	JMF
Magnesium, Total	ND		ug/l	100	15.3	1	07/25/23 15:53	08/09/23 09:26	1,6010D	JMF
Potassium, Total	ND		ug/l	2500	237.	1	07/25/23 15:53	08/09/23 09:26	1,6010D	JMF
Sodium, Total	254.	J	ug/l	2000	120.	1	07/25/23 15:53	08/09/23 09:26	1,6010D	JMF

Prep Information

Digestion Method: EPA 3005A

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342282

Report Date: 08/11/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-03,05-06 Batch: WG1807431-2								
Calcium, Total	102		-		80-120	-		
Iron, Total	100		-		80-120	-		
Magnesium, Total	98		-		80-120	-		
Potassium, Total	115		-		80-120	-		
Sodium, Total	113		-		80-120	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342282
Report Date: 08/11/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-03,05-06 QC Batch ID: WG1807431-3 QC Sample: L2341411-02 Client ID: MS Sample												
Calcium, Total	132000	10000	140000	80		-	-		75-125	-		20
Iron, Total	20900	1000	21900	100		-	-		75-125	-		20
Magnesium, Total	19000	10000	29400	104		-	-		75-125	-		20
Potassium, Total	8520	10000	21400	**129**	Q	-	-		75-125	-		20
Sodium, Total	57100	10000	70900	**138**	Q	-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342282

Report Date: 08/11/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-03,05-06 QC Batch ID: WG1807431-4 QC Sample: L2341411-02 Client ID: DUP Sample						
Calcium, Total	132000	122000	ug/l	8		20
Iron, Total	20900	19800	ug/l	5		20
Magnesium, Total	19000	18400	ug/l	3		20
Potassium, Total	8520	8110	ug/l	5		20
Sodium, Total	57100	54600	ug/l	4		20

INORGANICS
&
MISCELLANEOUS

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2342282
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-01
Client ID: S-480_SL_20230724
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/21/23 12:10
Date Received: 07/21/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Alkalinity, Bicarbonate	178000		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	204000		ug/l	5000	839.	10	-	07/24/23 22:28	44,300.0	CVN
Nitrogen, Nitrate	58.6		ug/l	50.0	12.8	1	-	07/24/23 18:27	44,300.0	CVN
Sulfate	511.	J	ug/l	1000	454.	1	-	07/24/23 18:27	44,300.0	CVN

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2342282
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-02
Client ID: S-481_20230721
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/21/23 11:40
Date Received: 07/21/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Alkalinity, Bicarbonate	48000		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	23100		ug/l	500	83.9	1	-	07/24/23 23:11	44,300.0	CVN
Nitrogen, Nitrate	ND		ug/l	50.0	12.8	1	-	07/24/23 23:11	44,300.0	CVN
Sulfate	13000		ug/l	1000	454.	1	-	07/24/23 23:11	44,300.0	CVN

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2342282
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-03
Client ID: S-482_20230720
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/20/23 15:00
Date Received: 07/21/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Alkalinity, Bicarbonate	230000		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	243000		ug/l	5000	839.	10	-	07/24/23 22:39	44,300.0	CVN
Nitrogen, Nitrate	ND		ug/l	50.0	12.8	1	-	07/24/23 18:49	44,300.0	CVN
Sulfate	39000		ug/l	1000	454.	1	-	07/24/23 18:49	44,300.0	CVN

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2342282
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-05
Client ID: S-283_SL_20230721
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/21/23 14:35
Date Received: 07/21/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Alkalinity, Bicarbonate	168000		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	12800		ug/l	500	83.9	1	-	07/24/23 23:22	44,300.0	CVN
Nitrogen, Nitrate	ND		ug/l	50.0	12.8	1	-	07/24/23 23:22	44,300.0	CVN
Sulfate	10800		ug/l	1000	454.	1	-	07/24/23 23:22	44,300.0	CVN

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2342282
Report Date: 08/11/23

SAMPLE RESULTS

Lab ID: L2342282-06
Client ID: S-382_SL_20230721
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/21/23 14:45
Date Received: 07/21/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Alkalinity, Bicarbonate	161000		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	79700		ug/l	5000	839.	10	-	07/24/23 19:22	44,300.0	CVN
Nitrogen, Nitrate	ND		ug/l	50.0	12.8	1	-	07/24/23 19:11	44,300.0	CVN
Sulfate	9340		ug/l	1000	454.	1	-	07/24/23 19:11	44,300.0	CVN

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2342282
Report Date: 08/11/23

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Anions by Ion Chromatography - Westborough Lab for sample(s): 01-03,05-06 Batch: WG1807143-1										
Chloride	ND		ug/l	500	83.9	1	-	07/24/23 18:06	44,300.0	CVN
Nitrogen, Nitrate	35.6	J	ug/l	50.0	12.8	1	-	07/24/23 18:06	44,300.0	CVN
Sulfate	ND		ug/l	1000	454.	1	-	07/24/23 18:06	44,300.0	CVN
General Chemistry - Westborough Lab for sample(s): 01-03,05-06 Batch: WG1810434-1										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
General Chemistry - Westborough Lab for sample(s): 01-03,05-06 Batch: WG1810437-1										
Alkalinity, Bicarbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342282

Report Date: 08/11/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-03,05-06 Batch: WG1807143-2								
Chloride	98		-		90-110	-		
Nitrogen, Nitrate	99		-		90-110	-		
Sulfate	104		-		90-110	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342282
Report Date: 08/11/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-03,05-06 QC Batch ID: WG1807143-3 QC Sample: L2342282-02 Client ID: S-481_20230721												
Chloride	23100	4000	25100	**50**	Q	-	-		90-110	-		18
Nitrogen, Nitrate	ND	400	378	95		-	-		90-110	-		15
Sulfate	13000	8000	19600	**82**	Q	-	-		90-110	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342282

Report Date: 08/11/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-03,05-06 QC Batch ID: WG1807143-4 QC Sample: L2342282-02 Client ID: S-481_20230721						
Chloride	23100	23200	ug/l	0		18
Nitrogen, Nitrate	ND	ND	ug/l	NC		15
Sulfate	13000	13400	ug/l	3		20
General Chemistry - Westborough Lab Associated sample(s): 01-03,05-06 QC Batch ID: WG1810434-3 QC Sample: L2341781-02 Client ID: DUP Sample						
Alkalinity, Carbonate	ND	ND	ug CaCO3/L	NC		10
General Chemistry - Westborough Lab Associated sample(s): 01-03,05-06 QC Batch ID: WG1810437-3 QC Sample: L2341781-02 Client ID: DUP Sample						
Alkalinity, Bicarbonate	336000	339000	ug CaCO3/L	1		9

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342282
Report Date: 08/11/23

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent
B	Absent
C	Absent
D	Absent
E	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2342282-01A	Vial HCl preserved	A	NA		4.3	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342282-01B	Vial HCl preserved	A	NA		4.3	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342282-01C	Vial HCl preserved	A	NA		4.3	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342282-01E	Vial HCl preserved	A	NA		4.3	Y	Absent		PA-TPH-GRO(14)
L2342282-01F	Vial HCl preserved	A	NA		4.3	Y	Absent		PA-TPH-GRO(14)
L2342282-01G	Vial HCl preserved	A	NA		4.3	Y	Absent		PA-TPH-GRO(14)
L2342282-01H	20ml Vial HCl preserved	A	NA		4.3	Y	Absent		DISSGAS(14)
L2342282-01I	20ml Vial HCl preserved	A	NA		4.3	Y	Absent		DISSGAS(14)
L2342282-01J	Vial unpreserved 20ml	A	NA		4.3	Y	Absent		DISSGAS-CO2(7)
L2342282-01K	Vial unpreserved 20ml	A	NA		4.3	Y	Absent		DISSGAS-CO2(7)
L2342282-01L	Plastic 500ml unpreserved	A	7	7	4.3	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2342282-01M	Plastic 250ml unpreserved/No Headspace	A	NA		4.3	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2342282-01N	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	4.3	Y	Absent		SUB-SULFIDE()
L2342282-01O	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	4.3	Y	Absent		SUB-SULFIDE()
L2342282-01P	Plastic 250ml HNO3 preserved	A	<2	<2	4.3	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),NA-TI-PPB(180),K-TI-PPB(180),FE-TI-PPB(180)
L2342282-01Q	Amber 500ml unpreserved	A	7	7	4.3	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-01R	Amber 500ml unpreserved	A	7	7	4.3	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-01S	Amber 500ml unpreserved	A	7	7	4.3	Y	Absent		PA-TPH-DROD-C44(7)

*Values in parentheses indicate holding time in days

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342282
Report Date: 08/11/23

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2342282-01T	Amber 500ml unpreserved	A	7	7	4.3	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-01U	Amber 500ml unpreserved	A	7	7	4.3	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-01V	Amber 500ml unpreserved	A	7	7	4.3	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-02A	Vial HCl preserved	D	NA		3.1	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342282-02B	Vial HCl preserved	D	NA		3.1	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342282-02C	Vial HCl preserved	D	NA		3.1	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342282-02E	Vial HCl preserved	D	NA		3.1	Y	Absent		PA-TPH-GRO(14)
L2342282-02F	Vial HCl preserved	D	NA		3.1	Y	Absent		PA-TPH-GRO(14)
L2342282-02G	Vial HCl preserved	D	NA		3.1	Y	Absent		PA-TPH-GRO(14)
L2342282-02H	20ml Vial HCl preserved	D	NA		3.1	Y	Absent		DISSGAS(14)
L2342282-02I	20ml Vial HCl preserved	D	NA		3.1	Y	Absent		DISSGAS(14)
L2342282-02J	Vial unpreserved 20ml	D	NA		3.1	Y	Absent		DISSGAS-CO2(7)
L2342282-02K	Vial unpreserved 20ml	D	NA		3.1	Y	Absent		DISSGAS-CO2(7)
L2342282-02L	Plastic 500ml unpreserved	D	7	7	3.1	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2342282-02M	Plastic 250ml unpreserved/No Headspace	D	NA		3.1	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2342282-02N	Plastic 250ml Zn Acetate/NaOH preserved	D	>9	>9	3.1	Y	Absent		SUB-SULFIDE()
L2342282-02O	Plastic 250ml Zn Acetate/NaOH preserved	D	>9	>9	3.1	Y	Absent		SUB-SULFIDE()
L2342282-02P	Plastic 250ml HNO3 preserved	D	<2	<2	3.1	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),K-TI-PPB(180),NA-TI-PPB(180),FE-TI-PPB(180)
L2342282-02Q	Amber 500ml unpreserved	D	7	7	3.1	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-02R	Amber 500ml unpreserved	D	7	7	3.1	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-02S	Amber 500ml unpreserved	D	7	7	3.1	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-02T	Amber 500ml unpreserved	D	7	7	3.1	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-02U	Amber 500ml unpreserved	D	7	7	3.1	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-02V	Amber 500ml unpreserved	D	7	7	3.1	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-03A	Vial HCl preserved	B	NA		3.8	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342282-03B	Vial HCl preserved	B	NA		3.8	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342282-03C	Vial HCl preserved	B	NA		3.8	Y	Absent		PA-8260-SIM(14),PA-8260(14)

*Values in parentheses indicate holding time in days

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2342282-03E	Vial HCl preserved	B	NA		3.8	Y	Absent		PA-TPH-GRO(14)
L2342282-03F	Vial HCl preserved	B	NA		3.8	Y	Absent		PA-TPH-GRO(14)
L2342282-03G	Vial HCl preserved	B	NA		3.8	Y	Absent		PA-TPH-GRO(14)
L2342282-03H	20ml Vial HCl preserved	B	NA		3.8	Y	Absent		DISSGAS(14)
L2342282-03I	20ml Vial HCl preserved	B	NA		3.8	Y	Absent		DISSGAS(14)
L2342282-03J	Vial unpreserved 20ml	B	NA		3.8	Y	Absent		DISSGAS-CO2(7)
L2342282-03K	Vial unpreserved 20ml	B	NA		3.8	Y	Absent		DISSGAS-CO2(7)
L2342282-03L	Plastic 500ml unpreserved	B	7	7	3.8	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2342282-03M	Plastic 250ml unpreserved/No Headspace	B	NA		3.8	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2342282-03N	Plastic 250ml Zn Acetate/NaOH preserved	B	>9	>9	3.8	Y	Absent		SUB-SULFIDE()
L2342282-03O	Plastic 250ml Zn Acetate/NaOH preserved	B	>9	>9	3.8	Y	Absent		SUB-SULFIDE()
L2342282-03P	Plastic 250ml HNO3 preserved	B	<2	<2	3.8	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),K-TI-PPB(180),NA-TI-PPB(180),FE-TI-PPB(180)
L2342282-03Q	Amber 500ml unpreserved	B	7	7	3.8	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-03R	Amber 500ml unpreserved	B	7	7	3.8	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-03S	Amber 500ml unpreserved	B	7	7	3.8	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-03T	Amber 500ml unpreserved	B	7	7	3.8	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-03U	Amber 500ml unpreserved	B	7	7	3.8	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-03V	Amber 500ml unpreserved	B	7	7	3.8	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-04A	Vial HCl preserved	B	NA		3.8	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342282-04B	Vial HCl preserved	B	NA		3.8	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342282-05A	Vial HCl preserved	C	NA		3.8	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342282-05B	Vial HCl preserved	C	NA		3.8	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342282-05C	Vial HCl preserved	C	NA		3.8	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342282-05E	Vial HCl preserved	C	NA		3.8	Y	Absent		PA-TPH-GRO(14)
L2342282-05F	Vial HCl preserved	C	NA		3.8	Y	Absent		PA-TPH-GRO(14)
L2342282-05G	Vial HCl preserved	C	NA		3.8	Y	Absent		PA-TPH-GRO(14)
L2342282-05H	20ml Vial HCl preserved	C	NA		3.8	Y	Absent		DISSGAS(14)

*Values in parentheses indicate holding time in days

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2342282-05I	20ml Vial HCl preserved	C	NA		3.8	Y	Absent		DISSGAS(14)
L2342282-05J	Vial unpreserved 20ml	C	NA		3.8	Y	Absent		DISSGAS-CO2(7)
L2342282-05K	Vial unpreserved 20ml	C	NA		3.8	Y	Absent		DISSGAS-CO2(7)
L2342282-05L	Plastic 500ml unpreserved	C	7	7	3.8	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2342282-05M	Plastic 250ml unpreserved/No Headspace	C	NA		3.8	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2342282-05N	Plastic 250ml Zn Acetate/NaOH preserved	C	>9	>9	3.8	Y	Absent		SUB-SULFIDE()
L2342282-05O	Plastic 250ml Zn Acetate/NaOH preserved	C	>9	>9	3.8	Y	Absent		SUB-SULFIDE()
L2342282-05P	Plastic 250ml HNO3 preserved	C	<2	<2	3.8	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),K-TI-PPB(180),NA-TI-PPB(180),FE-TI-PPB(180)
L2342282-05Q	Amber 500ml unpreserved	C	7	7	3.8	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-05R	Amber 500ml unpreserved	C	7	7	3.8	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-05S	Amber 500ml unpreserved	C	7	7	3.8	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-05T	Amber 500ml unpreserved	C	7	7	3.8	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-05U	Amber 500ml unpreserved	C	7	7	3.8	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-05V	Amber 500ml unpreserved	C	7	7	3.8	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-06A	Vial HCl preserved	E	NA		4.6	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342282-06B	Vial HCl preserved	E	NA		4.6	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342282-06C	Vial HCl preserved	E	NA		4.6	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342282-06E	Vial HCl preserved	E	NA		4.6	Y	Absent		PA-TPH-GRO(14)
L2342282-06F	Vial HCl preserved	E	NA		4.6	Y	Absent		PA-TPH-GRO(14)
L2342282-06G	Vial HCl preserved	E	NA		4.6	Y	Absent		PA-TPH-GRO(14)
L2342282-06H	20ml Vial HCl preserved	E	NA		4.6	Y	Absent		DISSGAS(14)
L2342282-06I	20ml Vial HCl preserved	E	NA		4.6	Y	Absent		DISSGAS(14)
L2342282-06J	Vial unpreserved 20ml	E	NA		4.6	Y	Absent		DISSGAS-CO2(7)
L2342282-06K	Vial unpreserved 20ml	E	NA		4.6	Y	Absent		DISSGAS-CO2(7)
L2342282-06L	Plastic 500ml unpreserved	E	7	7	4.6	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2342282-06M	Plastic 250ml unpreserved/No Headspace	E	NA		4.6	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2342282-06N	Plastic 250ml Zn Acetate/NaOH preserved	E	>9	>9	4.6	Y	Absent		SUB-SULFIDE()

*Values in parentheses indicate holding time in days

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342282
Report Date: 08/11/23

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2342282-06O	Plastic 250ml Zn Acetate/NaOH preserved	E	>9	>9	4.6	Y	Absent		SUB-SULFIDE()
L2342282-06P	Plastic 250ml HNO3 preserved	E	<2	<2	4.6	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),K-TI-PPB(180),NA-TI-PPB(180),FE-TI-PPB(180)
L2342282-06Q	Amber 500ml unpreserved	E	7	7	4.6	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-06R	Amber 500ml unpreserved	E	7	7	4.6	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-06S	Amber 500ml unpreserved	E	7	7	4.6	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-06T	Amber 500ml unpreserved	E	7	7	4.6	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-06U	Amber 500ml unpreserved	E	7	7	4.6	Y	Absent		PA-TPH-DROD-C44(7)
L2342282-06V	Amber 500ml unpreserved	E	7	7	4.6	Y	Absent		PA-TPH-DROD-C44(7)

Container Comments

L2342282-03K	vial received broken

*Values in parentheses indicate holding time in days

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2342282
Project Number:	213403039	**Report Date:**	08/11/23

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: DU Report with 'J' Qualifiers

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2342282
Project Number:	213403039	**Report Date:**	08/11/23

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively

Report Format: DU Report with 'J' Qualifiers

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2342282
Project Number:	213403039	**Report Date:**	08/11/23

Data Qualifiers

Identified Compounds (TICs). For calculated parameters, this represents that one or more values used in the calculation were estimated.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

ND - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2342282
Project Number:	213403039	**Report Date:**	08/11/23

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.

44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.

117 Technical Guidance for the Natural Attenuation Indicators: Methane, Ethane, and Ethene, EPA-NE, Revision 1, February 21, 2002 and Sample Preparation & Calculations for Dissolved Gas Analysis in Water Samples using a GC Headspace Equilibration Technique, EPA RSKSOP-175, Revision 2, May 2004.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 7/22/23

ALPHA Job #: L2342282 ~~L2342289~~

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: PESRM @ STANTEC
Address: 1060 Andrew Dr. Ste 140
West Chester, PA 19380
Phone: 610-840-2500
Fax: 610-840-2500
Email: andrew.klingel@stantec.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: PESRM UDEX Release
Project Location: Former PHL refinery
Project #: 213403039
Project Manager: Andrew Klingbeil
ALPHA Quote #: 21953

Turn-Around Time

☑ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due: Time:

Report Information - Data Deliverables

☐ FAX ☐ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program	Criteria

Other Project Specific Requirements/Comments/Detection Limits:

See quote 21953 and July 14, 2023 email andrew K for details on analysis

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	PA volatile organics 8260C	TPH-GRO, Extended (C9-C44) 8015D	Alkalinity (Carb and Bicarb) SM2320B	Chloride, Sulfate, Nitrate, Nitrite 9056A	Dissolved gases (incl CH4, C2s) RSK175	Total Cr, Fe, Mg, K, Na 6010D	Sulfide SM4500	VOCs	TOTAL # BOTTLES	Sample Specific Comments
~~42289~~-01	S-480_SL_20230721	7/21	1210	W	JC	X	X	X	X	X	X	X			
42282-02	S-481_20230721	7/21	1140	W	AA	X	X	X	X	X	X	X			
03	S-482_20230720	7/20	1500	W	AA	X	X	X	X	X	X	X			
04	TRIP BLANK	7/17	NA	W	LAB								X		
05	S-283_SL_20230721	7/21	1435	W	CO	X	X	X	X	X	X	X			
06	S-382_SL_20230721	7/21	1445	W	JC	X	X	X	X	X	X	X			

SAMPLE HANDLING

Filtration
☐ Done
☐ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

Container Type															
Preservative															

Relinquished By:	Date/Time	Received By:	Date/Time
Chase Dangl	07/21 1530		7/21/23 15:30
	7/21/23 1800		7/20/23 1800

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 14-OCT-07)

Pace Analytical Services, LLC
575 Broad Hollow Road
Melville, NY 11747
516-370-6000

July 28, 2023

Reports
Alpha Analytical
8 Walkup Drive
Westborough, MA 01581

RE: Project: L2342282
Pace Project No.: 70264348

Dear Reports:

Enclosed are the analytical results for sample(s) received by the laboratory on July 25, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Melville

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Wayne Bryce
wayne.bryce@pacelabs.com
(631)694-3040
Project Manager

Enclosures

cc: Michael Chang, Alpha Analytical
Candy Fox, Alpha Analytical
Ben Rao, Alpha Analytical

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Pace Analytical Services, LLC
575 Broad Hollow Road
Melville, NY 11747
516-370-6000

CERTIFICATIONS

Project: L2342282
Pace Project No.: 70264348

Pace Analytical Services Long Island
575 Broad Hollow Rd, Melville, NY 11747
Connecticut Certification #: PH-0435
Delaware Certification # NY 10478
Maryland Certification #: 208
Massachusetts Certification #: M-NY026
New Hampshire Certification #: 2987
New Jersey Certification #: NY158
New York Certification #: 10478 Primary Accrediting Body
Pennsylvania Certification #: 68-00350
Rhode Island Certification #: LAO00340
Virginia Certification # 460302

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Pace Analytical Services, LLC
575 Broad Hollow Road
Melville, NY 11747
516-370-6000

ANALYTICAL RESULTS

Project: L2342282
Pace Project No.: 70264348

Sample: S-480_SL_20230724 **Lab ID: 70264348001** Collected: 07/21/23 12:10 Received: 07/25/23 08:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
4500S2F W Sulfide Iodometric	Analytical Method: SM22 4500-S2 F Pace Analytical Services - Melville							
Sulfide	**<2.0**	mg/L	2.0	1		07/28/23 12:49		

REPORT OF LABORATORY ANALYSIS

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Melville, NY 11747
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ANALYTICAL RESULTS

Project: L2342282
Pace Project No.: 70264348

Sample: S-481_20230721 **Lab ID: 70264348002** Collected: 07/21/23 11:40 Received: 07/25/23 08:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
4500S2F W Sulfide Iodometric	Analytical Method: SM22 4500-S2 F Pace Analytical Services - Melville							
Sulfide	**<2.0**	mg/L	2.0	1		07/28/23 12:51		

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Melville, NY 11747
516-370-6000

ANALYTICAL RESULTS

Project: L2342282
Pace Project No.: 70264348

Sample: S-482_20230720 **Lab ID: 70264348003** Collected: 07/20/23 15:00 Received: 07/25/23 08:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
4500S2F W Sulfide Iodometric	Analytical Method: SM22 4500-S2 F Pace Analytical Services - Melville							
Sulfide	**<2.0**	mg/L	2.0	1		07/26/23 16:23		

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575 Broad Hollow Road
Melville, NY 11747
516-370-6000

ANALYTICAL RESULTS

Project: L2342282
Pace Project No.: 70264348

Sample: S-283_SL_20230721 **Lab ID: 70264348004** Collected: 07/21/23 14:35 Received: 07/25/23 08:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
4500S2F W Sulfide Iodometric	Analytical Method: SM22 4500-S2 F Pace Analytical Services - Melville							
Sulfide	**<2.0**	mg/L	2.0	1		07/28/23 12:53		

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Melville, NY 11747
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ANALYTICAL RESULTS

Project: L2342282
Pace Project No.: 70264348

Sample: S-382_SL_20230721 **Lab ID: 70264348005** Collected: 07/21/23 14:45 Received: 07/25/23 08:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
4500S2F W Sulfide Iodometric	Analytical Method: SM22 4500-S2 F Pace Analytical Services - Melville							
Sulfide	**<2.0**	mg/L	2.0	1		07/28/23 12:55		

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
575 Broad Hollow Road
Melville, NY 11747
516-370-6000

QUALITY CONTROL DATA

Project: L2342282
Pace Project No.: 70264348

QC Batch: 313803
QC Batch Method: SM22 4500-S2 F
Analysis Method: SM22 4500-S2 F
Analysis Description: 4500S2F W Sulfide Iodometric
Laboratory: Pace Analytical Services - Melville
Associated Lab Samples: 70264348003

METHOD BLANK: 1595418 Matrix: Water
Associated Lab Samples: 70264348003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfide	mg/L	ND	2.0	07/26/23 16:19	

LABORATORY CONTROL SAMPLE & LCSD: 1595419 1595420

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Sulfide	mg/L	14	14.0	14.0	100	100	85-115	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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575 Broad Hollow Road
Melville, NY 11747
516-370-6000

QUALITY CONTROL DATA

Project: L2342282
Pace Project No.: 70264348

QC Batch: 313974
QC Batch Method: SM22 4500-S2 F
Analysis Method: SM22 4500-S2 F
Analysis Description: 4500S2F W Sulfide Iodometric
Laboratory: Pace Analytical Services - Melville
Associated Lab Samples: 70264348001, 70264348002, 70264348004, 70264348005

METHOD BLANK: 1596487 Matrix: Water
Associated Lab Samples: 70264348001, 70264348002, 70264348004, 70264348005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfide	mg/L	ND	2.0	07/28/23 12:43	

LABORATORY CONTROL SAMPLE & LCSD: 1596488 1596489

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Sulfide	mg/L	14	14.0	14.0	100	100	85-115	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
575 Broad Hollow Road
Melville, NY 11747
516-370-6000

QUALIFIERS

Project: L2342282
Pace Project No.: 70264348

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: L2342282
Pace Project No.: 70264348

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
70264348001	**S-480_SL_20230724**	SM22 4500-S2 F	313974		
70264348002	**S-481_20230721**	SM22 4500-S2 F	313974		
70264348003	**S-482_20230720**	SM22 4500-S2 F	313803		
70264348004	**S-283_SL_20230721**	SM22 4500-S2 F	313974		
70264348005	**S-382_SL_20230721**	SM22 4500-S2 F	313974		

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Subcontract Chain of Custody

Pace Analytical (NY)
575 Broad Hollow Road
Melville, NY 11747

Alpha Job Number
L2342282

Client Information	Project Information	Regulatory Requirements/Report Limits
Client: Alpha Analytical Labs Address: Eight Walkup Drive Westborough, MA 01581-1019 Phone: 508.439.5155 Email: mvitanza@alphalab.com	Project Location: PA Project Manager: Marty Vitanza **Turnaround & Deliverables Information** Due Date: Deliverables:	State/Federal Program: Regulatory Criteria:

Project Specific Requirements and/or Report Requirements

Reference following Alpha Job Number on final report/deliverables: L2342282

Report to include Method Blank, LCS/LCSD:

Additional Comments: Send all results/reports to subreports@alphalab.com

Lab ID	Client ID	Collection Date/Time	Sample Matrix	Analysis	Batch QC
	S-480_SL_20230724	07-21-23 12:10	WATER	Sulfide	
	S-481_20230721	07-21-23 11:40	WATER	Sulfide	
	S-482_20230720	07-20-23 15:00	WATER	Sulfide	
	S-283_SL_20230721	07-21-23 14:35	WATER	Sulfide	
	S-382_SL_20230721	07-21-23 14:45	WATER	Sulfide	

WO# : 70264348
70264348

	Relinquished By:	Date/Time:	Received By:	Date/Time:
		7/24/23	AAL	7/24/23 17:30
	AAL	7/24/23 23:15		7/24/23 23:20
			AAL	7/25/23 4:10
Form No: AL_subcoc	AAL	7/25/23 8:05		7/25/23 8:15

Serial_No:08112309:50

Client: ALPHA

Profile #: 5378

Work ID: L2342282

COC Page _____ of _____

☐ Use Point Number Spreadsheet ☐ Multiday Project

☐ Add SCLOGFD to first sample for field charge

COC Line Item	Matrix	VG9U	VG9C	VG9H	VG9S	DG9T	DG9Y	DG9P	DG9A	DG6T	DG9S	AG4U	AG3U	AG2U	AG1U	AG34	AG3S	AG4E	AG3T	AG2R	AG1T	AG1H	AG1A	CG1U	BP4U	BP3U	BP2U	BP1U	BP3S	BP2S	BP4N	BP3N	BP2N	BP3C	BP3T	BP35	BP3R	BP1Z	BP1N	BP1B	SP5T	R	WG2U	WGFU	WGKU	WGDU	ZPLC	GN	WP	IOC	SOC	BP3Z							
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12																																																																	

Container Codes

Glass			
VG9U	40mL unpres clear vial	AG4U	125mL unpres amber glass
VG9C	40mL Ascorbic-HCl clear vial	AG3U	250mL unpres amber glass
VG9H	40mL HCl clear vial	AG2U	500mL unpres amber glass
VG9S	40mL Sulfuirc clear vial	AG1U	1liter unpres amber glass
DG9T	40mL Na Thiosulfate vial	AG34	Ammonium Cl 250mL bottle
DG9Y	40mL Citrate-Na Thiosulfate	AG3S	250mL H2SO4 amber glass
DG9P	40mL amber vial - TSP	AG4E	125mL EDA amber glass
DG9A	Ascorbic/Maleic Acid 40mL	AG3T	250mL Na Thio amber glass
DG6T	Na Thio 60mL Vial	AG2R	Na Sulfite 500mL (blue Cap)
DG9S	Ammonium Cl/CuSO4 40mL	AG1T	Na Thiosulfate 1L bottle
CG1U	1L Unpres Jar (Con Ed)	AG1H	1L HCl amber glass
		AG1A	(NH4Cl)
WG9O	8oz clear soil jar		
WG4O	4oz clear soil jar		

Plastic	
BP4U	125mL unpreserved plastic
BP3U	250mL unpreserved plastic
BP2U	500mL unpreserved plastic
BP1U	1L unpreserved plastic
BP4N	125mL HNO3 plastic
BP3N	250mL HNO3 plastic
BP2N	500mL HNO3 plastic
BP3S	250mL H2SO4 plastic
BP2S	500mL H2SO4 plastic
BP3C	NaOH 250mL bottle
BP3T	250mL Trizma
BP35	250mL Ammonium Acetate
BP3R	250mL NH4SO4-NH4OH
BP1Z	1L NaOH, Zn Acetate
BP1N	1L HNO3 plastic
BP1B	Na Thiosulfate Amber Bottle

Misc.	
SP5T	120mL Coliform Na Thio
R	Terracore Kit
WG2U	2oz Unpreserved Jar
WGFU	4oz Unpreserved Jar
WGKU	8oz Unpreserved Jar
WGDU	16oz Unpreserved Jar
ZPLC	Ziplock Bag
TEDL	Tedlar Bag
BG1H	1L HCL Clear Glass
GN	General
WP	Wipe

IOC	
BP1U	1L unpreserved plastic
BP3N*	250mL HNO3 plastic
BP3C	250mL Sodium Hydroxide
AG2U	500mL unpres amber glass

* Can also be a BP4N

Matrix	
WT	Water
SL	Solid
NAL	Non-aqueous Liquid
OL	OIL
WP	Wipe
DW	Drinking Water

SOC	
VG9T	40mL Na Thio amber vial
DG9A	40mL Ascorbic acid/ maleic Acid vials
DG9Y	Citrate/Na Thiosulfate 40mL
DG6T	Na Thiosulfate 60mL vial
DG6M	MonoClActetic/Na Thio 60mL
AG3U	250mL unpres amber glass
AG3T	Na Thiosulfate 250mL bottle
BP1B	Na Thiosulfate Amber bottle
AG1T	Na Thiosulfate 1L Amber
AG1A	525.3 Chemical Blend

Sender Initials _____

Additional Comments

WO#: 70264348

PM: WB Due Date: 08/03/23

CLIENT: ALPHA

Serial_No:08112309:50

DC#_Title: ENV-FRM-MELV-0024 v4_SCUR
Effective Date: 5/23/2023

WO#: 70264348
PM: WB **Due Date: 08/03/23**
CLIENT: ALPHA

Client Name: ALPHA Project #

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Commercial ☐ Pace ☐ Other

Tracking #:

Custody Seal on Cooler/Box Present: ☐ Yes ☑ No Seals intact: ☑ Yes ☐ No [illegible] Present: ☐ Yes ☐ No

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ Ziploc ☐ None ☐ Other Type of Ice: Wet Blue None

Thermometer Used: TH188 Correction Factor: -0.3 ☐ Samples on ice, cooling process has begun

Cooler Temperature(°C): 2.4 Cooler Temperature Corrected(°C): 2.1 Date/Time 5035A kits placed in freezer

Temp should be above freezing to 6.0°C

USDA Regulated Soil (☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check map)? ☐ Yes ☐ No

Did samples orignate from a foreign source including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (ENV-FRM-MELV-0076) and include with SCUR/COC paperwork.

Date and Initials of person examining contents: SH 7/25/23

				COMMENTS:
Chain of Custody Present:	☑Yes	☐No		1.
Chain of Custody Filled Out:	☑Yes	☐No		2.
Chain of Custody Relinquished:	☑Yes	☐No		3.
Sampler Name & Signature on COC:	☑Yes	☐No	☐N/A	4.
Samples Arrived within Hold Time:	☑Yes	☐No		5.
Short Hold Time Analysis (<72hr):	☐Yes	☑No		6.
Rush Turn Around Time Requested	☐Yes	☑No		7.
Sufficient Volume: (Triple volume provided for MS/MSD)	☑Yes	☐No		8.
Correct Containers Used:	☑Yes	☐No		9.
-Pace Containers Used:	☑Yes	☐No		
Containers Intact:	☑Yes	☐No		10.
Filtered volume received for Dissolved tests	☐Yes	☐No	☑N/A	11. Note: if sediment is visible in the dissolved container.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: SL WT OIL OTHER	☑Yes	☐No		12.

Date and Initials of person checking preservation: SH 7/25/23

All containers needing preservation have been checked.	☐Yes	☐No	☑N/A	13. ☐ HNO_3 ☐ H_2SO_4 ☐ NaOH ☐ HCl
pH paper Lot #				Sample #
All containers needing preservation are found to be in compliance with method recommendation? (HNO_3, H_2SO_4, HCl, NaOH>9 Sulfide, NaOH>12 Cyanide)	☐Yes	☐No	☑N/A	
Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water). Per Method, VOA pH is checked after analysis				Initial when completed: / Lot # of added preservative: / Date/Time preservative added:
Samples checked for dechlorination:	☐Yes	☐No	☑N/A	14.
KI starch test strips Lot #				Positive for Res. Chlorine? Y N
Residual chlorine strips Lot #				
SM 4500 CN samples checked for sul	☐Yes	☐No	☑N/A	15.
Lead Acetate Strips Lot #				Positive for Sulfide? Y N
Headspace in VOA Vials (>6mm):	☐Yes	☐No	☑N/A	16.
Trip Blank Present:	☐Yes	☐No	☑N/A	17.
Trip Blank Custody Seals Present	☐Yes	☐No	☑N/A	

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

* PM (Project Manager) review is documented electronically in LIMS.

ANALYTICAL REPORT

Lab Number:	L2342918
Client:	Stantec, Inc. 1060 Andrew Drive Suite 140 West Chester, PA 19380
ATTN:	Andrew Klingbeil
Phone:	(610) 840-2525
Project Name:	PESRM UDEX RELEASE
Project Number:	213403039
Report Date:	08/14/23

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342918
Report Date: 08/14/23

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2342918-01	S-479_20230725	WATER	FORMER PHL REFINERY	07/25/23 10:55	07/26/23
L2342918-02	S-483_20230725	WATER	FORMER PHL REFINERY	07/25/23 14:25	07/26/23
L2342918-03	TRIP BLANK	WATER	FORMER PHL REFINERY	07/25/23 00:00	07/26/23
L2342918-04	POLOCK STREET EFF_20230510-G	WATER	FORMER PHL REFINERY	05/10/23 08:30	07/26/23

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2342918
Project Number:	213403039	**Report Date:**	08/14/23

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2342918
Project Number:	213403039	**Report Date:**	08/14/23

Case Narrative (continued)

Report Submission

August 14, 2023: This final report includes the results of all requested analyses.

August 09, 2023: This is a preliminary report.

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

The analysis of Sulfide was subcontracted. A copy of the laboratory report is included as an addendum. Please note: This data is only available in PDF format and is not available on Data Merger.

Sample Receipt

L2342918-01 and -02: The Client IDs were changed at the client's request.

L2342918-04: A sample identified as "POLOCK STREET EFF_20230510-G" was received, but not listed on the Chain of Custody. At the client's request, this sample was not analyzed.

Volatile Organics by SIM

L2342918-01D and -02D: The sample has elevated detection limits due to the dilution required by the elevated concentrations of non-target compounds in the sample.

Carbon Dioxide

The WG1808899-5 MS recovery, performed on L2342918-02, is outside the acceptance criteria for carbon dioxide (255%). The unacceptable percent recovery is attributed to the elevated concentration of target compound present in the native sample.

Anions by Ion Chromatography

The WG1808455-3 MS recovery, performed on L2342918-01, is outside the acceptance criteria for sulfate (119%); however, the associated LCS recovery is within criteria. No further action was taken.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Tiffani Morrissey - Tiffani Morrissey

Title: Technical Director/Representative Date: 08/14/23

ORGANICS

VOLATILES

Project Name: PESRM UDEX RELEASE
Lab Number: L2342918
Project Number: 213403039
Report Date: 08/14/23

SAMPLE RESULTS

Lab ID: L2342918-01
Client ID: S-479_20230725
Sample Location: FORMER PHL REFINERY

Date Collected: 07/25/23 10:55
Date Received: 07/26/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/28/23 10:40
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	53.0		mg/l	3.00	3.00	1

Project Name: PESRM UDEX RELEASE
Lab Number: L2342918
Project Number: 213403039
Report Date: 08/14/23

SAMPLE RESULTS

Lab ID: L2342918-01
Client ID: S-479_20230725
Sample Location: FORMER PHL REFINERY
Date Collected: 07/25/23 10:55
Date Received: 07/26/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 08/01/23 08:55
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	7420		ug/l	2.00	2.00	1	A
Ethene	ND		ug/l	0.500	0.500	1	A
Ethane	ND		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342918

Project Number: 213403039 **Report Date:** 08/14/23

SAMPLE RESULTS

Lab ID: L2342918-01 D
Client ID: S-479_20230725
Sample Location: FORMER PHL REFINERY

Date Collected: 07/25/23 10:55
Date Received: 07/26/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 08/07/23 15:10
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	50	2.4	10
Chloromethane	ND		ug/l	25	2.0	10
Vinyl chloride	ND		ug/l	10	0.71	10
Bromomethane	ND		ug/l	10	2.6	10
Chloroethane	ND		ug/l	10	1.3	10
Trichlorofluoromethane	ND		ug/l	25	1.6	10
1,1-Dichloroethene	ND		ug/l	5.0	1.7	10
Carbon disulfide	ND		ug/l	50	3.0	10
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	25	1.5	10
Methylene chloride	9.0	J	ug/l	25	6.8	10
Acetone	ND		ug/l	50	15.	10
trans-1,2-Dichloroethene	ND		ug/l	7.5	1.6	10
Methyl Acetate	ND		ug/l	20	2.3	10
Methyl tert butyl ether	ND		ug/l	10	1.7	10
1,1-Dichloroethane	ND		ug/l	7.5	2.1	10
cis-1,2-Dichloroethene	ND		ug/l	5.0	1.9	10
1,2-Dichloroethene, Total	ND		ug/l	5.0	1.6	10
Cyclohexane	280		ug/l	100	2.7	10
Bromochloromethane	ND		ug/l	25	1.5	10
Chloroform	ND		ug/l	7.5	2.2	10
Carbon tetrachloride	ND		ug/l	5.0	1.3	10
1,1,1-Trichloroethane	ND		ug/l	5.0	1.6	10
2-Butanone	ND		ug/l	50	19.	10
Benzene	1000		ug/l	5.0	1.6	10
1,2-Dichloroethane	ND		ug/l	5.0	1.3	10
Methyl cyclohexane	110		ug/l	100	4.0	10
Trichloroethene	ND		ug/l	5.0	1.8	10
1,2-Dichloropropane	ND		ug/l	10	1.4	10

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342918

Project Number: 213403039 **Report Date:** 08/14/23

SAMPLE RESULTS

Lab ID: L2342918-01 D Date Collected: 07/25/23 10:55

Client ID: S-479_20230725 Date Received: 07/26/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	5.0	1.9	10
cis-1,3-Dichloropropene	ND		ug/l	5.0	1.4	10
Toluene	160		ug/l	7.5	2.0	10
Tetrachloroethene	ND		ug/l	5.0	1.8	10
4-Methyl-2-pentanone	ND		ug/l	50	4.2	10
trans-1,3-Dichloropropene	ND		ug/l	5.0	1.6	10
1,3-Dichloropropene, Total	ND		ug/l	5.0	1.4	10
1,1,2-Trichloroethane	ND		ug/l	7.5	1.4	10
Dibromochloromethane	ND		ug/l	5.0	1.5	10
1,2-Dibromoethane	ND		ug/l	20	1.9	10
2-Hexanone	ND		ug/l	50	5.2	10
Chlorobenzene	ND		ug/l	5.0	1.8	10
Ethylbenzene	1.9	J	ug/l	5.0	1.7	10
p/m-Xylene	5.2	J	ug/l	10	3.3	10
o-Xylene	ND		ug/l	10	3.9	10
Xylenes, Total	5.2	J	ug/l	10	3.3	10
Styrene	ND		ug/l	10	3.6	10
Bromoform	ND		ug/l	20	2.5	10
Isopropylbenzene	ND		ug/l	5.0	1.9	10
1,3-Dichlorobenzene	ND		ug/l	25	1.9	10
1,4-Dichlorobenzene	ND		ug/l	25	1.9	10
1,2-Dichlorobenzene	ND		ug/l	25	1.8	10
1,2-Dibromo-3-chloropropane	ND		ug/l	25	3.5	10
1,2,4-Trichlorobenzene	ND		ug/l	25	2.2	10
1,2,3-Trichlorobenzene	ND		ug/l	25	2.3	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	110		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	106		70-130
Dibromofluoromethane	102		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342918

Project Number: 213403039 **Report Date:** 08/14/23

SAMPLE RESULTS

Lab ID: L2342918-01 D
Client ID: S-479_20230725
Sample Location: FORMER PHL REFINERY

Date Collected: 07/25/23 10:55
Date Received: 07/26/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 08/07/23 15:10
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	30	11.	10
1,1,2,2-Tetrachloroethane	ND		ug/l	0.500	0.057	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	90		70-130
4-Bromofluorobenzene	97		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2342918
Project Number: 213403039
Report Date: 08/14/23

SAMPLE RESULTS

Lab ID: L2342918-02
Client ID: S-483_20230725
Sample Location: FORMER PHL REFINERY

Date Collected: 07/25/23 14:25
Date Received: 07/26/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 07/28/23 10:57
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Dissolved Gases by GC - Mansfield Lab						
Carbon Dioxide	44.4		mg/l	3.00	3.00	1

Project Name: PESRM UDEX RELEASE
Lab Number: L2342918
Project Number: 213403039
Report Date: 08/14/23

SAMPLE RESULTS

Lab ID: L2342918-02
Client ID: S-483_20230725
Sample Location: FORMER PHL REFINERY

Date Collected: 07/25/23 14:25
Date Received: 07/26/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 08/01/23 09:12
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	302		ug/l	2.00	2.00	1	A
Ethene	0.622		ug/l	0.500	0.500	1	A
Ethane	ND		ug/l	0.500	0.500	1	A

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342918

Project Number: 213403039 **Report Date:** 08/14/23

SAMPLE RESULTS

Lab ID: L2342918-02 D
Client ID: S-483_20230725
Sample Location: FORMER PHL REFINERY

Date Collected: 07/25/23 14:25
Date Received: 07/26/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 08/04/23 11:23
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	100	4.9	20
Chloromethane	ND		ug/l	50	4.0	20
Vinyl chloride	ND		ug/l	20	1.4	20
Bromomethane	ND		ug/l	20	5.1	20
Chloroethane	ND		ug/l	20	2.7	20
Trichlorofluoromethane	ND		ug/l	50	3.2	20
1,1-Dichloroethene	ND		ug/l	10	3.4	20
Carbon disulfide	ND		ug/l	100	6.0	20
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	50	3.0	20
Methylene chloride	ND		ug/l	50	14.	20
Acetone	ND		ug/l	100	29.	20
trans-1,2-Dichloroethene	ND		ug/l	15	3.3	20
Methyl Acetate	ND		ug/l	40	4.7	20
Methyl tert butyl ether	ND		ug/l	20	3.3	20
1,1-Dichloroethane	ND		ug/l	15	4.2	20
cis-1,2-Dichloroethene	ND		ug/l	10	3.7	20
1,2-Dichloroethene, Total	ND		ug/l	10	3.3	20
Cyclohexane	70	J	ug/l	200	5.4	20
Bromochloromethane	ND		ug/l	50	3.0	20
Chloroform	ND		ug/l	15	4.4	20
Carbon tetrachloride	ND		ug/l	10	2.7	20
1,1,1-Trichloroethane	ND		ug/l	10	3.2	20
2-Butanone	ND		ug/l	100	39.	20
Benzene	1100		ug/l	10	3.2	20
1,2-Dichloroethane	ND		ug/l	10	2.6	20
Methyl cyclohexane	16	J	ug/l	200	7.9	20
Trichloroethene	ND		ug/l	10	3.5	20
1,2-Dichloropropane	ND		ug/l	20	2.7	20

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342918

Project Number: 213403039 **Report Date:** 08/14/23

SAMPLE RESULTS

Lab ID: L2342918-02 D Date Collected: 07/25/23 14:25

Client ID: S-483_20230725 Date Received: 07/26/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	10	3.8	20
cis-1,3-Dichloropropene	ND		ug/l	10	2.9	20
Toluene	2400		ug/l	15	4.1	20
Tetrachloroethene	ND		ug/l	10	3.6	20
4-Methyl-2-pentanone	ND		ug/l	100	8.3	20
trans-1,3-Dichloropropene	ND		ug/l	10	3.3	20
1,3-Dichloropropene, Total	ND		ug/l	10	2.9	20
1,1,2-Trichloroethane	ND		ug/l	15	2.9	20
Dibromochloromethane	ND		ug/l	10	3.0	20
1,2-Dibromoethane	ND		ug/l	40	3.9	20
2-Hexanone	27	J	ug/l	100	10.	20
Chlorobenzene	ND		ug/l	10	3.6	20
Ethylbenzene	7.0	J	ug/l	10	3.3	20
p/m-Xylene	27		ug/l	20	6.6	20
o-Xylene	ND		ug/l	20	7.8	20
Xylenes, Total	27		ug/l	20	6.6	20
Styrene	ND		ug/l	20	7.2	20
Bromoform	ND		ug/l	40	5.0	20
Isopropylbenzene	ND		ug/l	10	3.7	20
1,3-Dichlorobenzene	ND		ug/l	50	3.7	20
1,4-Dichlorobenzene	ND		ug/l	50	3.7	20
1,2-Dichlorobenzene	ND		ug/l	50	3.7	20
1,2-Dibromo-3-chloropropane	ND		ug/l	50	7.1	20
1,2,4-Trichlorobenzene	ND		ug/l	50	4.4	20
1,2,3-Trichlorobenzene	ND		ug/l	50	4.7	20

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	111		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	109		70-130
Dibromofluoromethane	100		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342918

Project Number: 213403039 **Report Date:** 08/14/23

SAMPLE RESULTS

Lab ID: L2342918-02 D
Client ID: S-483_20230725
Sample Location: FORMER PHL REFINERY

Date Collected: 07/25/23 14:25
Date Received: 07/26/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 08/04/23 11:23
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	60	21.	20
1,1,2,2-Tetrachloroethane	ND		ug/l	1.00	0.114	20

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	91		70-130
4-Bromofluorobenzene	99		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342918

Project Number: 213403039 **Report Date:** 08/14/23

SAMPLE RESULTS

Lab ID: L2342918-03 Date Collected: 07/25/23 00:00
Client ID: TRIP BLANK Date Received: 07/26/23
Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D
Analytical Date: 08/04/23 08:58
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	5.0	0.24	1
Chloromethane	ND		ug/l	2.5	0.20	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Bromomethane	ND		ug/l	1.0	0.26	1
Chloroethane	ND		ug/l	1.0	0.13	1
Trichlorofluoromethane	ND		ug/l	2.5	0.16	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
Carbon disulfide	ND		ug/l	5.0	0.30	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15	1
Methylene chloride	ND		ug/l	2.5	0.68	1
Acetone	ND		ug/l	5.0	1.5	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16	1
Methyl Acetate	ND		ug/l	2.0	0.23	1
Methyl tert butyl ether	ND		ug/l	1.0	0.17	1
1,1-Dichloroethane	ND		ug/l	0.75	0.21	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16	1
Cyclohexane	ND		ug/l	10	0.27	1
Bromochloromethane	ND		ug/l	2.5	0.15	1
Chloroform	ND		ug/l	0.75	0.22	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16	1
2-Butanone	ND		ug/l	5.0	1.9	1
Benzene	ND		ug/l	0.50	0.16	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
Methyl cyclohexane	ND		ug/l	10	0.40	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342918

Project Number: 213403039 **Report Date:** 08/14/23

SAMPLE RESULTS

Lab ID: L2342918-03 Date Collected: 07/25/23 00:00

Client ID: TRIP BLANK Date Received: 07/26/23

Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Bromodichloromethane	ND		ug/l	0.50	0.19	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
Toluene	ND		ug/l	0.75	0.20	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,2-Dibromoethane	ND		ug/l	2.0	0.19	1
2-Hexanone	ND		ug/l	5.0	0.52	1
Chlorobenzene	ND		ug/l	0.50	0.18	1
Ethylbenzene	ND		ug/l	0.50	0.17	1
p/m-Xylene	ND		ug/l	1.0	0.33	1
o-Xylene	ND		ug/l	1.0	0.39	1
Xylenes, Total	ND		ug/l	1.0	0.33	1
Styrene	ND		ug/l	1.0	0.36	1
Bromoform	ND		ug/l	2.0	0.25	1
Isopropylbenzene	ND		ug/l	0.50	0.19	1
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	112		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	104		70-130
Dibromofluoromethane	104		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342918

Project Number: 213403039 **Report Date:** 08/14/23

SAMPLE RESULTS

Lab ID: L2342918-03 Date Collected: 07/25/23 00:00
Client ID: TRIP BLANK Date Received: 07/26/23
Sample Location: FORMER PHL REFINERY Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8260D-SIM(M)
Analytical Date: 08/04/23 08:58
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	1.1	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	92		70-130
4-Bromofluorobenzene	95		70-130

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2342918
Report Date: 08/14/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 117,-
Analytical Date: 07/28/23 10:17
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL
Dissolved Gases by GC - Mansfield Lab for sample(s): 01-02 Batch: WG1808899-3					
Carbon Dioxide	ND		mg/l	3.00	3.00

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342918

Project Number: 213403039 **Report Date:** 08/14/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 117,-
Analytical Date: 08/01/23 08:32
Analyst: SRO

Parameter	Result	Qualifier	Units	RL	MDL	
Dissolved Gases by GC - Mansfield Lab for sample(s): 01-02 Batch: WG1810234-3						
Methane	ND		ug/l	2.00	2.00	A
Ethene	ND		ug/l	0.500	0.500	A
Ethane	ND		ug/l	0.500	0.500	A

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342918

Project Number: 213403039 **Report Date:** 08/14/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 08/04/23 06:32
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02-03 Batch: WG1811844-5					
Dichlorodifluoromethane	ND		ug/l	5.0	0.24
Chloromethane	ND		ug/l	2.5	0.20
Vinyl chloride	ND		ug/l	1.0	0.07
Bromomethane	ND		ug/l	1.0	0.26
Chloroethane	ND		ug/l	1.0	0.13
Trichlorofluoromethane	ND		ug/l	2.5	0.16
1,1-Dichloroethene	ND		ug/l	0.50	0.17
Carbon disulfide	ND		ug/l	5.0	0.30
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15
Methylene chloride	ND		ug/l	2.5	0.68
Acetone	ND		ug/l	5.0	1.5
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16
Methyl Acetate	ND		ug/l	2.0	0.23
Methyl tert butyl ether	ND		ug/l	1.0	0.17
1,1-Dichloroethane	ND		ug/l	0.75	0.21
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16
Cyclohexane	ND		ug/l	10	0.27
Bromochloromethane	ND		ug/l	2.5	0.15
Chloroform	ND		ug/l	0.75	0.22
Carbon tetrachloride	ND		ug/l	0.50	0.13
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16
2-Butanone	ND		ug/l	5.0	1.9
Benzene	ND		ug/l	0.50	0.16
1,2-Dichloroethane	ND		ug/l	0.50	0.13
Methyl cyclohexane	ND		ug/l	10	0.40
Trichloroethene	ND		ug/l	0.50	0.18
1,2-Dichloropropane	ND		ug/l	1.0	0.14
Bromodichloromethane	ND		ug/l	0.50	0.19

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342918

Project Number: 213403039 **Report Date:** 08/14/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 08/04/23 06:32
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02-03 Batch: WG1811844-5					
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14
Toluene	ND		ug/l	0.75	0.20
Tetrachloroethene	ND		ug/l	0.50	0.18
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14
Dibromochloromethane	ND		ug/l	0.50	0.15
1,2-Dibromoethane	ND		ug/l	2.0	0.19
2-Hexanone	ND		ug/l	5.0	0.52
Chlorobenzene	ND		ug/l	0.50	0.18
Ethylbenzene	ND		ug/l	0.50	0.17
p/m-Xylene	ND		ug/l	1.0	0.33
o-Xylene	ND		ug/l	1.0	0.39
Xylenes, Total	ND		ug/l	1.0	0.33
Styrene	ND		ug/l	1.0	0.36
Bromoform	ND		ug/l	2.0	0.25
Isopropylbenzene	ND		ug/l	0.50	0.19
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342918

Project Number: 213403039 **Report Date:** 08/14/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 08/04/23 06:32
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02-03 Batch: WG1811844-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	114		70-130
Toluene-d8	95		70-130
4-Bromofluorobenzene	105		70-130
Dibromofluoromethane	103		70-130

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2342918
Report Date: 08/14/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D-SIM(M)
Analytical Date: 08/04/23 06:32
Analyst: MCM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 02-03 Batch: WG1811845-5					
1,4-Dioxane	ND		ug/l	3.0	1.1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	93		70-130
4-Bromofluorobenzene	96		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342918

Project Number: 213403039 **Report Date:** 08/14/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 08/07/23 09:55
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1813073-5					
Dichlorodifluoromethane	ND		ug/l	5.0	0.24
Chloromethane	ND		ug/l	2.5	0.20
Vinyl chloride	ND		ug/l	1.0	0.07
Bromomethane	ND		ug/l	1.0	0.26
Chloroethane	ND		ug/l	1.0	0.13
Trichlorofluoromethane	ND		ug/l	2.5	0.16
1,1-Dichloroethene	ND		ug/l	0.50	0.17
Carbon disulfide	ND		ug/l	5.0	0.30
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/l	2.5	0.15
Methylene chloride	ND		ug/l	2.5	0.68
Acetone	ND		ug/l	5.0	1.5
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.16
Methyl Acetate	ND		ug/l	2.0	0.23
Methyl tert butyl ether	ND		ug/l	1.0	0.17
1,1-Dichloroethane	ND		ug/l	0.75	0.21
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.19
1,2-Dichloroethene, Total	ND		ug/l	0.50	0.16
Cyclohexane	ND		ug/l	10	0.27
Bromochloromethane	ND		ug/l	2.5	0.15
Chloroform	ND		ug/l	0.75	0.22
Carbon tetrachloride	ND		ug/l	0.50	0.13
1,1,1-Trichloroethane	ND		ug/l	0.50	0.16
2-Butanone	ND		ug/l	5.0	1.9
Benzene	ND		ug/l	0.50	0.16
1,2-Dichloroethane	ND		ug/l	0.50	0.13
Methyl cyclohexane	ND		ug/l	10	0.40
Trichloroethene	ND		ug/l	0.50	0.18
1,2-Dichloropropane	ND		ug/l	1.0	0.14
Bromodichloromethane	ND		ug/l	0.50	0.19

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342918

Project Number: 213403039 **Report Date:** 08/14/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 08/07/23 09:55
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1813073-5					
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14
Toluene	ND		ug/l	0.75	0.20
Tetrachloroethene	ND		ug/l	0.50	0.18
4-Methyl-2-pentanone	ND		ug/l	5.0	0.42
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14
1,1,2-Trichloroethane	ND		ug/l	0.75	0.14
Dibromochloromethane	ND		ug/l	0.50	0.15
1,2-Dibromoethane	ND		ug/l	2.0	0.19
2-Hexanone	ND		ug/l	5.0	0.52
Chlorobenzene	ND		ug/l	0.50	0.18
Ethylbenzene	ND		ug/l	0.50	0.17
p/m-Xylene	ND		ug/l	1.0	0.33
o-Xylene	ND		ug/l	1.0	0.39
Xylenes, Total	ND		ug/l	1.0	0.33
Styrene	ND		ug/l	1.0	0.36
Bromoform	ND		ug/l	2.0	0.25
Isopropylbenzene	ND		ug/l	0.50	0.19
1,3-Dichlorobenzene	ND		ug/l	2.5	0.19
1,4-Dichlorobenzene	ND		ug/l	2.5	0.19
1,2-Dichlorobenzene	ND		ug/l	2.5	0.18
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.35
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.22
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.23

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342918

Project Number: 213403039 **Report Date:** 08/14/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 08/07/23 09:55
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1813073-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	111		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	106		70-130
Dibromofluoromethane	104		70-130

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342918

Project Number: 213403039 **Report Date:** 08/14/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D-SIM(M)
Analytical Date: 08/07/23 09:55
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01 Batch: WG1813094-5					
1,4-Dioxane	ND		ug/l	3.0	1.1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.050	0.006

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	91		70-130
4-Bromofluorobenzene	96		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342918

Report Date: 08/14/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Dissolved Gases by GC - Mansfield Lab Associated sample(s): 01-02 Batch: WG1808899-2								
Carbon Dioxide	107		-		80-120	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342918

Report Date: 08/14/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Dissolved Gases by GC - Mansfield Lab Associated sample(s): 01-02 Batch: WG1810234-2									
Methane	100		-		80-120	-		25	A
Ethene	93		-		80-120	-		25	A
Ethane	93		-		80-120	-		25	A

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342918
Report Date: 08/14/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02-03 Batch: WG1811844-3 WG1811844-4								
Dichlorodifluoromethane	91		94		36-147	3		20
Chloromethane	96		97		64-130	1		20
Vinyl chloride	81		83		55-140	2		20
Bromomethane	82		83		39-139	1		20
Chloroethane	77		76		55-138	1		20
Trichlorofluoromethane	69		70		62-150	1		20
1,1-Dichloroethene	100		100		61-145	0		20
Carbon disulfide	110		110		51-130	0		20
1,1,2-Trichloro-1,2,2-Trifluoroethane	110		110		70-130	0		20
Methylene chloride	99		100		70-130	1		20
Acetone	100		100		58-148	0		20
trans-1,2-Dichloroethene	100		100		70-130	0		20
Methyl Acetate	110		110		70-130	0		20
Methyl tert butyl ether	96		98		63-130	2		20
1,1-Dichloroethane	110		110		70-130	0		20
cis-1,2-Dichloroethene	100		100		70-130	0		20
Cyclohexane	120		120		70-130	0		20
Bromochloromethane	110		100		70-130	10		20
Chloroform	110		100		70-130	10		20
Carbon tetrachloride	110		110		63-132	0		20
1,1,1-Trichloroethane	100		100		67-130	0		20
2-Butanone	110		110		63-138	0		20
Benzene	100		110		70-130	10		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342918
Report Date: 08/14/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02-03 Batch: WG1811844-3 WG1811844-4								
1,2-Dichloroethane	110		110		70-130	0		20
Methyl cyclohexane	100		100		70-130	0		20
Trichloroethene	96		98		70-130	2		20
1,2-Dichloropropane	100		100		70-130	0		20
Bromodichloromethane	100		100		67-130	0		20
cis-1,3-Dichloropropene	100		100		70-130	0		20
Toluene	98		98		70-130	0		20
Tetrachloroethene	96		97		70-130	1		20
4-Methyl-2-pentanone	89		92		59-130	3		20
trans-1,3-Dichloropropene	100		100		70-130	0		20
1,1,2-Trichloroethane	97		96		70-130	1		20
Dibromochloromethane	94		94		63-130	0		20
1,2-Dibromoethane	93		93		70-130	0		20
2-Hexanone	87		87		57-130	0		20
Chlorobenzene	95		97		75-130	2		20
Ethylbenzene	98		99		70-130	1		20
p/m-Xylene	95		95		70-130	0		20
o-Xylene	90		90		70-130	0		20
Styrene	90		90		70-130	0		20
Bromoform	87		86		54-136	1		20
Isopropylbenzene	97		98		70-130	1		20
1,3-Dichlorobenzene	90		92		70-130	2		20
1,4-Dichlorobenzene	92		92		70-130	0		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342918

Report Date: 08/14/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02-03 Batch: WG1811844-3 WG1811844-4								
1,2-Dichlorobenzene	88		88		70-130	0		20
1,2-Dibromo-3-chloropropane	81		80		41-144	1		20
1,2,4-Trichlorobenzene	86		88		70-130	2		20
1,2,3-Trichlorobenzene	86		87		70-130	1		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	102		100		70-130
Toluene-d8	98		97		70-130
4-Bromofluorobenzene	104		104		70-130
Dibromofluoromethane	101		100		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342918

Report Date: 08/14/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 02-03 Batch: WG1811845-3 WG1811845-4								
1,4-Dioxane	80		82		70-130	2		25
1,1,2,2-Tetrachloroethane	107		112		70-130	5		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	92		93		70-130
4-Bromofluorobenzene	96		96		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342918
Report Date: 08/14/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1813073-3 WG1813073-4								
Dichlorodifluoromethane	89		89		36-147	0		20
Chloromethane	99		100		64-130	1		20
Vinyl chloride	82		82		55-140	0		20
Bromomethane	76		81		39-139	6		20
Chloroethane	77		77		55-138	0		20
Trichlorofluoromethane	69		68		62-150	1		20
1,1-Dichloroethene	110		100		61-145	10		20
Carbon disulfide	120		110		51-130	9		20
1,1,2-Trichloro-1,2,2-Trifluoroethane	110		110		70-130	0		20
Methylene chloride	100		100		70-130	0		20
Acetone	93		91		58-148	2		20
trans-1,2-Dichloroethene	110		110		70-130	0		20
Methyl Acetate	110		110		70-130	0		20
Methyl tert butyl ether	96		97		63-130	1		20
1,1-Dichloroethane	120		120		70-130	0		20
cis-1,2-Dichloroethene	110		100		70-130	10		20
Cyclohexane	120		120		70-130	0		20
Bromochloromethane	110		110		70-130	0		20
Chloroform	110		110		70-130	0		20
Carbon tetrachloride	110		110		63-132	0		20
1,1,1-Trichloroethane	110		100		67-130	10		20
2-Butanone	100		100		63-138	0		20
Benzene	110		110		70-130	0		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342918
Report Date: 08/14/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1813073-3 WG1813073-4								
1,2-Dichloroethane	110		110		70-130	0		20
Methyl cyclohexane	100		100		70-130	0		20
Trichloroethene	100		97		70-130	3		20
1,2-Dichloropropane	110		110		70-130	0		20
Bromodichloromethane	110		100		67-130	10		20
cis-1,3-Dichloropropene	110		100		70-130	10		20
Toluene	100		99		70-130	1		20
Tetrachloroethene	99		98		70-130	1		20
4-Methyl-2-pentanone	86		87		59-130	1		20
trans-1,3-Dichloropropene	100		100		70-130	0		20
1,1,2-Trichloroethane	92		93		70-130	1		20
Dibromochloromethane	92		92		63-130	0		20
1,2-Dibromoethane	91		91		70-130	0		20
2-Hexanone	81		81		57-130	0		20
Chlorobenzene	97		97		75-130	0		20
Ethylbenzene	100		99		70-130	1		20
p/m-Xylene	100		95		70-130	5		20
o-Xylene	95		95		70-130	0		20
Styrene	95		95		70-130	0		20
Bromoform	82		83		54-136	1		20
Isopropylbenzene	100		100		70-130	0		20
1,3-Dichlorobenzene	92		92		70-130	0		20
1,4-Dichlorobenzene	91		90		70-130	1		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342918
Report Date: 08/14/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1813073-3 WG1813073-4								
1,2-Dichlorobenzene	88		88		70-130	0		20
1,2-Dibromo-3-chloropropane	76		76		41-144	0		20
1,2,4-Trichlorobenzene	87		88		70-130	1		20
1,2,3-Trichlorobenzene	83		83		70-130	0		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	99		99		70-130
Toluene-d8	98		97		70-130
4-Bromofluorobenzene	104		103		70-130
Dibromofluoromethane	101		100		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342918

Report Date: 08/14/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01 Batch: WG1813094-3 WG1813094-4								
1,4-Dioxane	91		91		70-130	0		25
1,1,2,2-Tetrachloroethane	98		105		70-130	7		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	90		92		70-130
4-Bromofluorobenzene	97		97		70-130

Matrix Spike Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342918

Report Date: 08/14/23

Parameter	*Native Sample*	*MS Added*	*MS Found*	*MS %Recovery*	*Qual*	*MSD Found*	*MSD %Recovery*	*Qual*	*Recovery Limits*	*RPD*	*Qual*	*RPD Limits*
Dissolved Gases by GC - Mansfield Lab	Associated sample(s): 01-02		QC Batch ID: WG1808899-5			QC Sample: L2342918-02			Client ID: S-483_20230725			
Carbon Dioxide	44.4	12	75.0	**255**	Q	-	-		80-120	-		25

Lab Duplicate Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342918
Report Date: 08/14/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Dissolved Gases by GC - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1808899-4 QC Sample: L2342918-01 Client ID: S-479_20230725						
Carbon Dioxide	53.0	46.0	mg/l	14		25

PETROLEUM HYDROCARBONS

Project Name: PESRM UDEX RELEASE
Lab Number: L2342918
Project Number: 213403039
Report Date: 08/14/23

SAMPLE RESULTS

Lab ID: L2342918-01
Client ID: S-479_20230725
Sample Location: FORMER PHL REFINERY

Date Collected: 07/25/23 10:55
Date Received: 07/26/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/30/23 13:07
Analyst: SR

Extraction Method: EPA 3510C
Extraction Date: 07/29/23 17:46

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	156	J	ug/l	500	43.1	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	66		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2342918
Project Number: 213403039
Report Date: 08/14/23

SAMPLE RESULTS

Lab ID: L2342918-01 D
Client ID: S-479_20230725
Sample Location: FORMER PHL REFINERY

Date Collected: 07/25/23 10:55
Date Received: 07/26/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 08/01/23 15:55
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	5600		ug/l	250	15.	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	119		70-130
4-Bromofluorobenzene	117		70-130

Project Name: PESRM UDEX RELEASE
Lab Number: L2342918
Project Number: 213403039
Report Date: 08/14/23

SAMPLE RESULTS

Lab ID: L2342918-02
Client ID: S-483_20230725
Sample Location: FORMER PHL REFINERY

Date Collected: 07/25/23 14:25
Date Received: 07/26/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 07/30/23 14:23
Analyst: SR

Extraction Method: EPA 3510C
Extraction Date: 07/29/23 17:46

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	383		ug/l	500	43.1	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	71		40-140

Project Name: PESRM UDEX RELEASE
Lab Number: L2342918
Project Number: 213403039
Report Date: 08/14/23

SAMPLE RESULTS

Lab ID: L2342918-02 D
Client ID: S-483_20230725
Sample Location: FORMER PHL REFINERY

Date Collected: 07/25/23 14:25
Date Received: 07/26/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 1,8015D(M)
Analytical Date: 08/01/23 16:26
Analyst: BAD

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	5300		ug/l	500	30.	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	110		70-130
4-Bromofluorobenzene	114		70-130

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2342918
Report Date: 08/14/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 07/30/23 11:52
Analyst: SR

Extraction Method: EPA 3510C
Extraction Date: 07/29/23 17:46

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 01-02 Batch: WG1809444-1					
TPH (C9-C44)	ND		ug/l	500	43.1

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	77		40-140

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342918

Project Number: 213403039 **Report Date:** 08/14/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 08/01/23 11:05
Analyst: BAD

Parameter	Result	Qualifier	Units	RL	MDL
Gasoline Range Organics - Westborough Lab for sample(s): 01-02 Batch: WG1811407-4					
Gasoline Range Organics	16	J	ug/l	50	3.0

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	112		70-130
4-Bromofluorobenzene	107		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342918

Report Date: 08/14/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01-02 Batch: WG1809444-2								
TPH (C9-C44)	73		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	68				40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342918

Report Date: 08/14/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Gasoline Range Organics - Westborough Lab	Associated sample(s): 01-02		Batch: WG1811407-2		WG1811407-3			
Gasoline Range Organics	95		100		80-120	5		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,1,1-Trifluorotoluene	108		112		70-130
4-Bromofluorobenzene	104		111		70-130

METALS

Project Name: PESRM UDEX RELEASE
Lab Number: L2342918
Project Number: 213403039
Report Date: 08/14/23

SAMPLE RESULTS

Lab ID: L2342918-01
Client ID: S-479_20230725
Sample Location: FORMER PHL REFINERY
Date Collected: 07/25/23 10:55
Date Received: 07/26/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	61700		ug/l	100.	35.0	1	08/02/23 06:24	08/14/23 14:22	EPA 3005A	1,6010D	AMW
Iron, Total	3840		ug/l	50.0	9.00	1	08/02/23 06:24	08/14/23 14:22	EPA 3005A	1,6010D	AMW
Magnesium, Total	9070		ug/l	100.	15.3	1	08/02/23 06:24	08/14/23 14:22	EPA 3005A	1,6010D	AMW
Potassium, Total	4160		ug/l	2500	237.	1	08/02/23 06:24	08/14/23 14:22	EPA 3005A	1,6010D	AMW
Sodium, Total	29800		ug/l	2000	120.	1	08/02/23 06:24	08/14/23 14:22	EPA 3005A	1,6010D	AMW

Project Name: PESRM UDEX RELEASE
Lab Number: L2342918
Project Number: 213403039
Report Date: 08/14/23

SAMPLE RESULTS

Lab ID: L2342918-02
Client ID: S-483_20230725
Sample Location: FORMER PHL REFINERY
Date Collected: 07/25/23 14:25
Date Received: 07/26/23
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Calcium, Total	48900		ug/l	100.	35.0	1	08/02/23 06:24	08/14/23 14:19	EPA 3005A	1,6010D	AMW
Iron, Total	10700		ug/l	50.0	9.00	1	08/02/23 06:24	08/14/23 14:19	EPA 3005A	1,6010D	AMW
Magnesium, Total	16700		ug/l	100.	15.3	1	08/02/23 06:24	08/14/23 14:19	EPA 3005A	1,6010D	AMW
Potassium, Total	4180		ug/l	2500	237.	1	08/02/23 06:24	08/14/23 14:19	EPA 3005A	1,6010D	AMW
Sodium, Total	141000		ug/l	2000	120.	1	08/02/23 06:24	08/14/23 14:19	EPA 3005A	1,6010D	AMW

Project Name: PESRM UDEX RELEASE **Lab Number:** L2342918

Project Number: 213403039 **Report Date:** 08/14/23

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1810456-1										
Calcium, Total	ND		ug/l	100	35.0	1	08/02/23 06:24	08/14/23 14:13	1,6010D	AMW
Iron, Total	ND		ug/l	50.0	9.00	1	08/02/23 06:24	08/14/23 14:13	1,6010D	AMW
Magnesium, Total	ND		ug/l	100	15.3	1	08/02/23 06:24	08/14/23 14:13	1,6010D	AMW
Potassium, Total	ND		ug/l	2500	237.	1	08/02/23 06:24	08/14/23 14:13	1,6010D	AMW
Sodium, Total	ND		ug/l	2000	120.	1	08/02/23 06:24	08/14/23 14:13	1,6010D	AMW

Prep Information

Digestion Method: EPA 3005A

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342918

Report Date: 08/14/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1810456-2								
Calcium, Total	106		-		80-120	-		
Iron, Total	105		-		80-120	-		
Magnesium, Total	100		-		80-120	-		
Potassium, Total	107		-		80-120	-		
Sodium, Total	107		-		80-120	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342918
Report Date: 08/14/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1810456-3 QC Sample: L2342918-01 Client ID: S-479_20230725												
Calcium, Total	61700	10000	72300	106		-	-		75-125	-		20
Iron, Total	3840	1000	4980	114		-	-		75-125	-		20
Magnesium, Total	9070	10000	19400	103		-	-		75-125	-		20
Potassium, Total	4160	10000	15300	111		-	-		75-125	-		20
Sodium, Total	29800	10000	40900	111		-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342918

Report Date: 08/14/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1810456-4 QC Sample: L2342918-01 Client ID: S-479_20230725						
Calcium, Total	61700	61800	ug/l	0		20
Iron, Total	3840	3850	ug/l	0		20
Magnesium, Total	9070	9030	ug/l	0		20
Potassium, Total	4160	4200	ug/l	1		20
Sodium, Total	29800	30000	ug/l	1		20

INORGANICS
&
MISCELLANEOUS

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2342918
Report Date: 08/14/23

SAMPLE RESULTS

Lab ID: L2342918-01
Client ID: S-479_20230725
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/25/23 10:55
Date Received: 07/26/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Alkalinity, Bicarbonate	182000		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	65800		ug/l	5000	839.	10	-	07/27/23 09:23	44,300.0	CVN
Nitrogen, Nitrate	ND		ug/l	50.0	12.8	1	-	07/27/23 09:11	44,300.0	CVN
Sulfate	6260		ug/l	1000	454.	1	-	07/27/23 09:11	44,300.0	CVN

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2342918
Report Date: 08/14/23

SAMPLE RESULTS

Lab ID: L2342918-02
Client ID: S-483_20230725
Sample Location: FORMER PHL REFINERY
Sample Depth:
Matrix: Water

Date Collected: 07/25/23 14:25
Date Received: 07/26/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Alkalinity, Bicarbonate	301000		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
Anions by Ion Chromatography - Westborough Lab										
Chloride	69100		ug/l	5000	839.	10	-	07/27/23 09:47	44,300.0	CVN
Nitrogen, Nitrate	51.8		ug/l	50.0	12.8	1	-	07/27/23 09:35	44,300.0	CVN
Sulfate	9950		ug/l	1000	454.	1	-	07/27/23 09:35	44,300.0	CVN

Project Name: PESRM UDEX RELEASE
Project Number: 213403039
Lab Number: L2342918
Report Date: 08/14/23

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Anions by Ion Chromatography - Westborough Lab for sample(s): 01-02 Batch: WG1808455-1										
Chloride	ND		ug/l	500	83.9	1	-	07/27/23 08:46	44,300.0	CVN
Nitrogen, Nitrate	ND		ug/l	50.0	12.8	1	-	07/27/23 08:46	44,300.0	CVN
Sulfate	ND		ug/l	1000	454.	1	-	07/27/23 08:46	44,300.0	CVN
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1810434-1										
Alkalinity, Carbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1810437-1										
Alkalinity, Bicarbonate	ND		ug CaCO3/L	2000	NA	1	-	08/01/23 14:40	121,2320B	NGS

Lab Control Sample Analysis

Batch Quality Control

Project Name: PESRM UDEX RELEASE

Project Number: 213403039

Lab Number: L2342918

Report Date: 08/14/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-02 Batch: WG1808455-2								
Chloride	104		-		90-110	-		
Nitrogen, Nitrate	103		-		90-110	-		
Sulfate	104		-		90-110	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342918
Report Date: 08/14/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1808455-3 QC Sample: L2342918-01 Client ID: S-479_20230725												
Chloride	65800	4000	104000	95		-	-		90-110	-		18
Nitrogen, Nitrate	ND	400	403	101		-	-		90-110	-		15
Sulfate	6260	4000	15700	**119**	Q	-	-		90-110	-		20

Lab Duplicate Analysis
Batch Quality Control

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342918
Report Date: 08/14/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1808455-4 QC Sample: L2342918-01 Client ID: S-479_20230725						
Nitrogen, Nitrate	ND	ND	ug/l	NC		15
Sulfate	6260	6930	ug/l	10		20
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1808455-4 QC Sample: L2342918-01 Client ID: S-479_20230725						
Chloride	65800	65600	ug/l	0		18
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1810434-3 QC Sample: L2341781-02 Client ID: DUP Sample						
Alkalinity, Carbonate	ND	ND	ug CaCO3/L	NC		10
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1810437-3 QC Sample: L2341781-02 Client ID: DUP Sample						
Alkalinity, Bicarbonate	336000	339000	ug CaCO3/L	1		9

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342918
Report Date: 08/14/23

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent
B	Absent
C	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2342918-01A	Vial HCl preserved	C	NA		4.4	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342918-01B	Vial HCl preserved	C	NA		4.4	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342918-01C	Vial HCl preserved	C	NA		4.4	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342918-01D	Vial HCl preserved	C	NA		4.4	Y	Absent		PA-TPH-GRO(14)
L2342918-01E	Vial HCl preserved	C	NA		4.4	Y	Absent		PA-TPH-GRO(14)
L2342918-01F	Vial HCl preserved	C	NA		4.4	Y	Absent		PA-TPH-GRO(14)
L2342918-01G	20ml Vial HCl preserved	C	NA		4.4	Y	Absent		DISSGAS(14)
L2342918-01H	20ml Vial HCl preserved	C	NA		4.4	Y	Absent		DISSGAS(14)
L2342918-01I	Vial unpreserved 20ml	C	NA		4.4	Y	Absent		DISSGAS-CO2(7)
L2342918-01J	Vial unpreserved 20ml	C	NA		4.4	Y	Absent		DISSGAS-CO2(7)
L2342918-01K	Plastic 500ml unpreserved/No Headspace	C	NA		4.4	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2342918-01L	Plastic 250ml HNO3 preserved	C	<2	<2	4.4	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),K-TI-PPB(180),NA-TI-PPB(180),FE-TI-PPB(180)
L2342918-01M	Plastic 250ml Zn Acetate/NaOH preserved	C	>9	>9	4.4	Y	Absent		SUB-SULFIDE()
L2342918-01N	Plastic 250ml Zn Acetate/NaOH preserved	C	>9	>9	4.4	Y	Absent		SUB-SULFIDE()
L2342918-01O	Plastic 500ml unpreserved	A	7	7	4.8	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2342918-01P	Amber 500ml unpreserved	C	7	7	4.4	Y	Absent		PA-TPH-DROD-C44(7)
L2342918-01Q	Amber 500ml unpreserved	C	7	7	4.4	Y	Absent		PA-TPH-DROD-C44(7)
L2342918-01R	Amber 500ml unpreserved	C	7	7	4.4	Y	Absent		PA-TPH-DROD-C44(7)
L2342918-01S	Amber 500ml unpreserved	C	7	7	4.4	Y	Absent		PA-TPH-DROD-C44(7)
L2342918-01T	Amber 500ml unpreserved	C	7	7	4.4	Y	Absent		PA-TPH-DROD-C44(7)

*Values in parentheses indicate holding time in days

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342918
Report Date: 08/14/23

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2342918-01U	Amber 500ml unpreserved	C	7	7	4.4	Y	Absent		PA-TPH-DROD-C44(7)
L2342918-02A	Vial HCl preserved	B	NA		3.6	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342918-02B	Vial HCl preserved	B	NA		3.6	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342918-02C	Vial HCl preserved	B	NA		3.6	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342918-02D	Vial HCl preserved	B	NA		3.6	Y	Absent		PA-TPH-GRO(14)
L2342918-02E	Vial HCl preserved	B	NA		3.6	Y	Absent		PA-TPH-GRO(14)
L2342918-02F	Vial HCl preserved	B	NA		3.6	Y	Absent		PA-TPH-GRO(14)
L2342918-02G	20ml Vial HCl preserved	B	NA		3.6	Y	Absent		DISSGAS(14)
L2342918-02H	20ml Vial HCl preserved	B	NA		3.6	Y	Absent		DISSGAS(14)
L2342918-02I	Vial unpreserved 20ml	B	NA		3.6	Y	Absent		DISSGAS-CO2(7)
L2342918-02J	Vial unpreserved 20ml	B	NA		3.6	Y	Absent		DISSGAS-CO2(7)
L2342918-02K	Plastic 500ml unpreserved/No Headspace	C	NA		4.4	Y	Absent		ALK-HCO3-2320-PPB(14),ALK-CO3-2320-PPB(14)
L2342918-02L	Plastic 250ml HNO3 preserved	C	<2	<2	4.4	Y	Absent		CA-TI-PPB(180),MG-TI-PPB(180),NA-TI-PPB(180),K-TI-PPB(180),FE-TI-PPB(180)
L2342918-02M	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	4.8	Y	Absent		SUB-SULFIDE()
L2342918-02N	Plastic 250ml Zn Acetate/NaOH preserved	C	>9	>9	4.4	Y	Absent		SUB-SULFIDE()
L2342918-02O	Plastic 500ml unpreserved	A	7	7	4.8	Y	Absent		SO4-300-PPB(28),CL-300-PPB(28),NO3-300-PPB(2)
L2342918-02P	Amber 500ml unpreserved	C	7	7	4.4	Y	Absent		PA-TPH-DROD-C44(7)
L2342918-02Q	Amber 500ml unpreserved	C	7	7	4.4	Y	Absent		PA-TPH-DROD-C44(7)
L2342918-02R	Amber 500ml unpreserved	A	7	7	4.8	Y	Absent		PA-TPH-DROD-C44(7)
L2342918-02S	Amber 500ml unpreserved	C	7	7	4.4	Y	Absent		PA-TPH-DROD-C44(7)
L2342918-02T	Amber 500ml unpreserved	C	NA		4.4	Y	Absent		PA-TPH-DROD-C44(7)
L2342918-02U	Amber 500ml unpreserved	C	NA		4.4	Y	Absent		PA-TPH-DROD-C44(7)
L2342918-03A	Vial HCl preserved	B	NA		3.6	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342918-03B	Vial HCl preserved	B	NA		3.6	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342918-03C	Vial HCl preserved	B	NA		3.6	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342918-03D	Vial HCl preserved	B	NA		3.6	Y	Absent		PA-8260-SIM(14),PA-8260(14)
L2342918-04A	Vial HCl preserved	B	NA		3.6	Y	Absent		ARCHIVE()

*Values in parentheses indicate holding time in days

Project Name: PESRM UDEX RELEASE
Project Number: 213403039

Lab Number: L2342918
Report Date: 08/14/23

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2342918-04B	Vial HCl preserved	B	NA		3.6	Y	Absent		ARCHIVE()
L2342918-04C	Vial HCl preserved	B	NA		3.6	Y	Absent		ARCHIVE()
L2342918-04D	Amber 250ml unpreserved	B	7	7	3.6	Y	Absent		ARCHIVE()
L2342918-04E	Amber 250ml unpreserved	B	7	7	3.6	Y	Absent		ARCHIVE()
L2342918-04F	Amber 1000ml unpreserved	B	7	7	3.6	Y	Absent		ARCHIVE()
L2342918-04G	Amber 1000ml unpreserved	B	7	7	3.6	Y	Absent		ARCHIVE()
L2342918-04H	Amber 1000ml HCl preserved	B	<2	<2	3.6	Y	Absent		ARCHIVE()
L2342918-04I	Amber 1000ml HCl preserved	B	<2	<2	3.6	Y	Absent		ARCHIVE()

*Values in parentheses indicate holding time in days

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2342918
Project Number:	213403039	**Report Date:**	08/14/23

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: DU Report with 'J' Qualifiers

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2342918
Project Number:	213403039	**Report Date:**	08/14/23

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively

Report Format: DU Report with 'J' Qualifiers

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2342918
Project Number:	213403039	**Report Date:**	08/14/23

Data Qualifiers

Identified Compounds (TICs). For calculated parameters, this represents that one or more values used in the calculation were estimated.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

ND - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Project Name:	PESRM UDEX RELEASE	**Lab Number:**	L2342918
Project Number:	213403039	**Report Date:**	08/14/23

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.

44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.

117 Technical Guidance for the Natural Attenuation Indicators: Methane, Ethane, and Ethene, EPA-NE, Revision 1, February 21, 2002 and Sample Preparation & Calculations for Dissolved Gas Analysis in Water Samples using a GC Headspace Equilibration Technique, EPA RSKSOP-175, Revision 2, May 2004.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

NEW YORK CHAIN OF CUSTODY

ALPHA ANALYTICAL

Westborough, MA 01581
8 Walkup Dr.
TEL: 508-898-9220
FAX: 508-898-9193

Mansfield, MA 02048
320 Forbes Blvd
TEL: 508-822-9300
FAX: 508-822-3288

Service Centers
Mahwah, NJ 07430: 35 Whitney Rd, Suite 5
Albany, NY 12205: 14 Walker Way
Tonawanda, NY 14150: 275 Cooper Ave, Suite 105

Page of

Date Rec'd in Lab: 7/27/23

ALPHA Job #: L2342918

Client Information

Client: PESRM c/o Stantec
Address: 1060 Andrew Dr. Suite 140 West Chester, PA
Phone: 610-840-2500
Fax: 610-840-2501
Email: andrew.klingbeil@stantec.com

Project Information

Project Name: PESRM UDEX Release
Project Location: Former PHL Refinery
Project #: 21340 3039
(Use Project name as Project #): ☐
Project Manager: Andrew Klingbeil
ALPHAQuote #: 21953

Turn-Around Time

Standard ☒ Due Date:
Rush (only if pre approved) ☐ # of Days:

Deliverables

☐ ASP-A ☐ ASP-B
☐ EQuIS (1 File) ☐ EQuIS (4 File)
☒ Other email

Regulatory Requirement

☐ NY TOGS ☐ NY Part 375
☐ AWQ Standards ☐ NY CP-51
☐ NY Restricted Use ☒ Other
☐ NY Unrestricted Use PA One Cleanup
☐ NYC Sewer Discharge

Billing Information

☒ Same as Client Info
PO #

Disposal Site Information

Please identify below location of applicable disposal facilities.
Disposal Facility:
☐ NJ ☐ NY
☐ Other:

These samples have been previously analyzed by Alpha ☐

Other project specific requirements/comments:

See quote 21953 and July 14TH, 2023 email from Andrew K. for details on analyses

Please specify Metals or TAL.

ANALYSIS

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	PA Volatile Org. 8260	TPH-GRO, Extended Ranges 8015D	Alkalinity 2320B (Carb and Bicarb)	Chloride, Sulfate, Nitrate 300	Dissolved gases (incl. CO2)	Total Ca, Fe, Mg, K, Na 6010D	Sulfide SM 4500		Total Bottle
42918-01	S-479	7/25/23	1055	GW	AA	X	X	X	X	X	X	X		19
-02	S-483	7/25/23	1425	GW	AA	X	X	X	X	X	X	X		19
-03	Trip Blank	7/25/23	--	TB	AA	X	X							4

Sample Filtration
☐ Done
☐ Lab to do
Preservation
☐ Lab to do
(Please Specify below)

Sample Specific Comments

Container Type	AV	AV	P	P	V	P	P			
Preservative	B	B	A	A	B,AC	K/E				

Preservative Code: A = None; B = HCl; C = HNO_3; D = H_2SO_4; E = NaOH; F = MeOH; G = $NaHSO_4$; H = $Na_2S_2O_3$; K/E = Zn Ac/NaOH; O = Other

Container Code: P = Plastic; A = Amber Glass; V = Vial; G = Glass; B = Bacteria Cup; C = Cube; O = Other; E = Encore; D = BOD Bottle

Westboro: Certification No: MA935
Mansfield: Certification No: MA015

Relinquished By:	Date/Time	Received By:	Date/Time
	7/26/23 1052		7/26/23 1052
	7/26/23 1800		7/26/23 1800
	7/26/23 2100	Anthony Green	JUL 26 2023 2100
Anthony Green	7/27/23 0100		7/27/23 0100
	7/27/23 0300		7/27/23 0300

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)

Form No: 01-25 HC (rev. 30-Sept-2013)

SGS

Dayton, NJ

08/01/23

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report



Technical Report for

Alpha Analytical Laboratories, Inc.

Alpha Analytical, PA

L2342918

SGS Job Number: JD70066

Sampling Date: 07/25/23

Report to:

Alpha Analytical Laboratories, Inc.
Eight Walkup Drive
Westborough, MA 01581
subreports@alphalab.com; mvitanza@alphalab.com

ATTN: Marty Vitanza

Total number of pages in report: **12**

NELAP ACCREDITED TNI LABORATORY

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable unless noted in the narrative, comments or footnotes.

David Chastain
General Manager

Client Service contact: Michelle Jenkins 732-329-0200
Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

This report shall not be reproduced, except in its entirety, without the written approval of SGS.
Test results relate only to samples analyzed.

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SGS North America Inc.

Sample Summary

Alpha Analytical Laboratories, Inc.

Job No: JD70066

Alpha Analytical, PA
Project No: L2342918

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JD70066-1	07/25/23	10:55		07/28/23	AQ	Water	S-479
JD70066-2	07/25/23	14:25		07/28/23	AQ	Water	S-483

Summary of Hits

Job Number: JD70066
Account: Alpha Analytical Laboratories, Inc.
Project: Alpha Analytical, PA
Collected: 07/25/23

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JD70066-1	**S-479**					
No hits reported in this sample.						
JD70066-2	**S-483**					
No hits reported in this sample.						

Sample Results

Report of Analysis

SGS North America Inc.

Report of Analysis

Client Sample ID:	S-479		
Lab Sample ID:	JD70066-1	**Date Sampled:**	07/25/23
Matrix:	AQ - Water	**Date Received:**	07/28/23
		Percent Solids:	n/a
Project:	Alpha Analytical, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfide	< 2.0	2.0	mg/l	1	07/31/23 13:24	MP	SM4500S2- F-11

RL = Reporting Limit

SGS North America Inc.

Report of Analysis

Client Sample ID:	S-483		
Lab Sample ID:	JD70066-2	**Date Sampled:**	07/25/23
Matrix:	AQ - Water	**Date Received:**	07/28/23
		Percent Solids:	n/a
Project:	Alpha Analytical, PA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sulfide	< 2.0	2.0	mg/l	1	07/31/23 13:24	MP	SM4500S2- F-11

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

ALPHA ANALYTICAL

Subcontract Chain of Custody

SGS- North America
2235 US-130
Dayton, NJ 08810

Alpha Job Number
L2342918

Client Information	Project Information	Regulatory Requirements/Report Limits
Client: Alpha Analytical Labs Address: Eight Walkup Drive Westborough, MA 01581-1019 Phone: 508.439.5155 Email: mvitanza@alphalab.com	Project Location: PA Project Manager: Marty Vitanza **Turnaround & Deliverables Information** Due Date: Deliverables:	State/Federal Program: Regulatory Criteria: JD70066

Project Specific Requirements and/or Report Requirements

Reference following Alpha Job Number on final report/deliverables: L2342918

Report to include Method Blank, LCS/LCSD:

Additional Comments: Send all results/reports to subreports@alphalab.com

Lab ID	Client ID	Collection Date/Time	Sample Matrix	Analysis	Batch QC
1	S-479	07-25-23 10:55	WATER	Sulfide	C46
2	S-483	07-25-23 14:25	WATER	Sulfide	

Initial Assessment: 23 HR

Label Verification:

Relinquished By:	Date/Time:	Received By:	Date/Time:
	7/27/23		7/27/23 17:30
	7/27/23 22:08		7/27/23 22:10
	7/27/23		7/28
7-28-23	7/27/23 9:33	7/28/23 9:34	

Form No: AL_subcoc

0.7 cP

JD70066: Chain of Custody
Page 1 of 2

SGS Sample Receipt Summary

Job Number: JD70066 **Client:** ALPHA **Project:** L2342981

Date / Time Received: 7/28/2023 9:34:00 AM **Delivery Method:** CLIENT **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (0.7);

Cooler Temps (Corrected) °C: Cooler 1: (0.4);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	IR Gun 40		
3. Cooler media:	Ice (Bag)		
4. No. Coolers:	1		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☑	☐
2. Trip Blank listed on COC:	☐		☑	☐
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Test Strip Lot #s: pH 1-12: 231619 pH 12+: 203117A Other: (Specify)

Comments

SM089-03
Rev. Date 12/7/17

JD70066: Chain of Custody
Page 2 of 2

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: JD70066
Account: ALPHAMAW - Alpha Analytical Laboratories, Inc.
Project: Alpha Analytical, PA

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Sulfide	GN44247	2.0	0.0	mg/l	10.2	10.2	100.0	80-120%
Sulfide	GN44247			mg/l	5.1	5.1	100.0	80-120%

Associated Samples:
Batch GN44247: JD70066-1, JD70066-2
(*) Outside of QC limits

Appendix F Soil Laboratory Reports

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Tel: (717)656-2300

Laboratory Job ID: 410-30049-1
Client Project/Site: UDEX

For:
Stantec Consulting Corp.
1060 Andrew Drive
Suite 140
West Chester, Pennsylvania 19380

Attn: Andrew Klingbeil

Authorized for release by:
3/3/2021 5:47:34 AM

Amek Carter, Project Manager
(717)556-7252
Loran.Carter@eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

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WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



Amek Carter
Project Manager
3/3/2021 5:47:34 AM

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Definitions/Glossary

Client: Stantec Consulting Corp.
Project/Site: UDEX

Job ID: 410-30049-1

Qualifiers

GC VOA

Qualifier	Qualifier Description
S1-	Surrogate recovery exceeds control limits, low biased.
S1+	Surrogate recovery exceeds control limits, high biased.

GC Semi VOA

Qualifier	Qualifier Description
FH	MS and/or MSD recovery above control limits.
S1+	Surrogate recovery exceeds control limits, high biased.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Stantec Consulting Corp.
Project/Site: UDEX

Job ID: 410-30049-1

Job ID: 410-30049-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Narrative

Job Narrative
410-30049-1

Receipt
The samples were received on 2/23/2021 3:58 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 5.7°C

Gasoline Range Organics
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Diesel Range Organics
Method 8015D_DRO: Surrogate recovery for the following samples were outside control limits: UDEX-VP-1A-22-20210223 (410-30049-4), UDEX-VP-1A-23-20210223 (410-30049-5), UDEX-VP-1A-24-20210223 (410-30049-6) and UDEX-VP-1A-25-20210223 (410-30049-7). Evidence of matrix interference due to high target analytes is present; therefore, re-extraction and/or re-analysis was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: Stantec Consulting Corp.
Project/Site: UDEX

Job ID: 410-30049-1

Client Sample ID: UDEX-VP-1A-19-20210223 — Lab Sample ID: 410-30049-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	25		3.9	0.71	mg/Kg	100	☼	8015D	Total/NA

Client Sample ID: UDEX-VP-1A-20-20210223 — Lab Sample ID: 410-30049-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	52		4.0	0.72	mg/Kg	100	☼	8015D	Total/NA

Client Sample ID: UDEX-VP-1A-21-20210223 — Lab Sample ID: 410-30049-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	74		3.8	0.68	mg/Kg	100	☼	8015D	Total/NA
DRO (C10-C28)	39		13	5.4	mg/Kg	1	☼	8015D	Total/NA

Client Sample ID: UDEX-VP-1A-22-20210223 — Lab Sample ID: 410-30049-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	12000		870	160	mg/Kg	20000	☼	8015D	Total/NA
DRO (C10-C28)	1500		68	28	mg/Kg	5	☼	8015D	Total/NA

Client Sample ID: UDEX-VP-1A-23-20210223 — Lab Sample ID: 410-30049-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	7600		450	81	mg/Kg	10000	☼	8015D	Total/NA
DRO (C10-C28)	2200		66	28	mg/Kg	5	☼	8015D	Total/NA

Client Sample ID: UDEX-VP-1A-24-20210223 — Lab Sample ID: 410-30049-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	19000		2100	380	mg/Kg	50000	☼	8015D	Total/NA
DRO (C10-C28)	3900		130	55	mg/Kg	10	☼	8015D	Total/NA

Client Sample ID: UDEX-VP-1A-25-20210223 — Lab Sample ID: 410-30049-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	6300		480	86	mg/Kg	10000	☼	8015D	Total/NA
DRO (C10-C28)	15000		350	140	mg/Kg	25	☼	8015D	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: UDEX-VP-1A-19-20210223

Lab Sample ID: 410-30049-1

Date Collected: 02/23/21 09:30
Matrix: Solid
Date Received: 02/23/21 15:58
Percent Solids: 91.8

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	25		3.9	0.71	mg/Kg	☼	02/23/21 20:58	02/24/21 22:34	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*102*		*50 - 142*	*02/23/21 20:58*	*02/24/21 22:34*	*100*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND	FH	13	5.4	mg/Kg	☼	02/25/21 16:06	02/26/21 13:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*105*		*42 - 143*	*02/25/21 16:06*	*02/26/21 13:46*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	8.2		1.0	1.0	%			02/24/21 13:05	1

Client Sample ID: UDEX-VP-1A-20-20210223

Lab Sample ID: 410-30049-2

Date Collected: 02/23/21 09:35
Matrix: Solid
Date Received: 02/23/21 15:58
Percent Solids: 91.2

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	52		4.0	0.72	mg/Kg	☼	02/23/21 20:58	02/24/21 23:10	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*91*		*50 - 142*	*02/23/21 20:58*	*02/24/21 23:10*	*100*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		13	5.4	mg/Kg	☼	02/25/21 16:06	02/26/21 14:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*104*		*42 - 143*	*02/25/21 16:06*	*02/26/21 14:58*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	8.8		1.0	1.0	%			02/24/21 13:05	1

Client Sample ID: UDEX-VP-1A-21-20210223

Lab Sample ID: 410-30049-3

Date Collected: 02/23/21 11:40
Matrix: Solid
Date Received: 02/23/21 15:58
Percent Solids: 91.2

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	74		3.8	0.68	mg/Kg	☼	02/23/21 20:58	02/24/21 23:47	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*103*		*50 - 142*	*02/23/21 20:58*	*02/24/21 23:47*	*100*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	39		13	5.4	mg/Kg	☼	02/25/21 16:06	02/26/21 18:09	1

Client Sample ID: UDEX-VP-1A-21-20210223

Lab Sample ID: 410-30049-3

Date Collected: 02/23/21 11:40
Matrix: Solid
Date Received: 02/23/21 15:58
Percent Solids: 91.2

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o- terphenyl (Surr)	98		42 - 143	02/25/21 16:06	02/26/21 18:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	8.8		1.0	1.0	%			02/24/21 13:05	1

Client Sample ID: UDEX-VP-1A-22-20210223

Lab Sample ID: 410-30049-4

Date Collected: 02/23/21 11:42
Matrix: Solid
Date Received: 02/23/21 15:58
Percent Solids: 87.3

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	12000		870	160	mg/Kg	☼	02/23/21 20:58	02/25/21 22:23	20000

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene (fid) (1C)	576	S1+	50 - 142	02/23/21 20:58	02/25/21 22:23	20000

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	1500		68	28	mg/Kg	☼	02/25/21 16:06	02/26/21 20:56	5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o- terphenyl (Surr)	180	S1+	42 - 143	02/25/21 16:06	02/26/21 20:56	5

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	12.7		1.0	1.0	%			02/24/21 13:05	1

Client Sample ID: UDEX-VP-1A-23-20210223

Lab Sample ID: 410-30049-5

Date Collected: 02/23/21 11:44
Matrix: Solid
Date Received: 02/23/21 15:58
Percent Solids: 89.0

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	7600		450	81	mg/Kg	☼	02/23/21 20:58	02/25/21 21:11	10000

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene (fid) (1C)	235	S1+	50 - 142	02/23/21 20:58	02/25/21 21:11	10000

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	2200		66	28	mg/Kg	☼	02/25/21 16:06	02/26/21 21:20	5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o- terphenyl (Surr)	218	S1+	42 - 143	02/25/21 16:06	02/26/21 21:20	5

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	11.0		1.0	1.0	%			02/24/21 13:05	1

Client Sample ID: UDEX-VP-1A-24-20210223

Lab Sample ID: 410-30049-6

Date Collected: 02/23/21 11:46
Matrix: Solid
Date Received: 02/23/21 15:58
Percent Solids: 90.2

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	19000		2100	380	mg/Kg	☼	02/23/21 20:58	02/25/21 22:58	50000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*0*	*S1-*	*50 - 142*	*02/23/21 20:58*	*02/25/21 22:58*	*50000*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	3900		130	55	mg/Kg	☼	02/25/21 16:06	02/26/21 21:44	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*296*	*S1+*	*42 - 143*	*02/25/21 16:06*	*02/26/21 21:44*	*10*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	9.8		1.0	1.0	%			02/24/21 13:05	1

Client Sample ID: UDEX-VP-1A-25-20210223

Lab Sample ID: 410-30049-7

Date Collected: 02/23/21 11:48
Matrix: Solid
Date Received: 02/23/21 15:58
Percent Solids: 85.9

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	6300		480	86	mg/Kg	☼	02/23/21 20:58	02/25/21 21:47	10000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*0*	*S1-*	*50 - 142*	*02/23/21 20:58*	*02/25/21 21:47*	*10000*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	15000		350	140	mg/Kg	☼	02/25/21 16:06	02/26/21 22:08	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*561*	*S1+*	*42 - 143*	*02/25/21 16:06*	*02/26/21 22:08*	*25*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	14.1		1.0	1.0	%			02/24/21 13:05	1

Surrogate Summary

Client: Stantec Consulting Corp.
Project/Site: UDEX

Job ID: 410-30049-1

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	TFT-F1 (50-142)							
410-30049-1	UDEX-VP-1A-19-20210223	102							
410-30049-2	UDEX-VP-1A-20-20210223	91							
410-30049-3	UDEX-VP-1A-21-20210223	103							
410-30049-4	UDEX-VP-1A-22-20210223	576 S1+							
410-30049-5	UDEX-VP-1A-23-20210223	235 S1+							
410-30049-6	UDEX-VP-1A-24-20210223	0 S1-							
410-30049-7	UDEX-VP-1A-25-20210223	0 S1-							
LCS 410-97120/5	Lab Control Sample	94							
LCS 410-97410/5	Lab Control Sample	91							
LCSD 410-97120/6	Lab Control Sample Dup	95							
LCSD 410-97410/6	Lab Control Sample Dup	93							
MB 410-97120/4	Method Blank	100							
MB 410-97410/4	Method Blank	96							

Surrogate Legend

TFT-F = a,a,a-Trifluorotoluene (fid)

Method: 8015D - Diesel Range Organics (DRO) (GC)

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	OTP (42-143)							
410-30049-1	UDEX-VP-1A-19-20210223	105							
410-30049-1 DU	UDEX-VP-1A-19-20210223	99							
410-30049-1 MS	UDEX-VP-1A-19-20210223	116							
410-30049-2	UDEX-VP-1A-20-20210223	104							
410-30049-3	UDEX-VP-1A-21-20210223	98							
410-30049-4	UDEX-VP-1A-22-20210223	180 S1+							
410-30049-5	UDEX-VP-1A-23-20210223	218 S1+							
410-30049-6	UDEX-VP-1A-24-20210223	296 S1+							
410-30049-7	UDEX-VP-1A-25-20210223	561 S1+							
LCS 410-97494/2-A	Lab Control Sample	106							
MB 410-97494/1-A	Method Blank	104							

Surrogate Legend

OTP = o- terphenyl (Surr)

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Lab Sample ID: MB 410-97120/4
Matrix: Solid
Analysis Batch: 97120

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	ND		1.0	0.18	mg/Kg			02/24/21 20:03	25

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*100*		*50 - 142*		*02/24/21 20:03*	*25*

Lab Sample ID: LCS 410-97120/5
Matrix: Solid
Analysis Batch: 97120

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (1C)			11.0	10.1		mg/Kg		92	60 - 132		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*94*		*50 - 142*

Lab Sample ID: LCSD 410-97120/6
Matrix: Solid
Analysis Batch: 97120

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (1C)			11.0	10.5		mg/Kg		96	60 - 132	4	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*95*		*50 - 142*

Lab Sample ID: MB 410-97410/4
Matrix: Solid
Analysis Batch: 97410

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	ND		1.0	0.18	mg/Kg			02/25/21 12:55	25

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*96*		*50 - 142*		*02/25/21 12:55*	*25*

Lab Sample ID: LCS 410-97410/5
Matrix: Solid
Analysis Batch: 97410

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (1C)			11.0	8.88		mg/Kg		81	60 - 132		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*91*		*50 - 142*

Method: 8015D - Gasoline Range Organics (GRO) (GC) (Continued)

Lab Sample ID: LCSD 410-97410/6
Matrix: Solid
Analysis Batch: 97410

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (1C)			11.0	9.28		mg/Kg		84	60 - 132	4	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*93*		*50 - 142*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 410-97494/1-A
Matrix: Solid
Analysis Batch: 97735

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 97494

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		12	5.0	mg/Kg		02/25/21 16:05	02/26/21 12:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*104*		*42 - 143*	*02/25/21 16:05*	*02/26/21 12:58*	*1*

Lab Sample ID: LCS 410-97494/2-A
Matrix: Solid
Analysis Batch: 97735

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 97494

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
DRO (C10-C28)			134	144		mg/Kg		107	76 - 117		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o- terphenyl (Surr)	*106*		*42 - 143*

Lab Sample ID: 410-30049-1 MS
Matrix: Solid
Analysis Batch: 97735

Client Sample ID: UDEX-VP-1A-19-20210223
Prep Type: Total/NA
Prep Batch: 97494

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
DRO (C10-C28)	ND	FH	146	172	FH	mg/Kg	☼	118	76 - 117		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
o- terphenyl (Surr)	*116*		*42 - 143*

Lab Sample ID: 410-30049-1 DU
Matrix: Solid
Analysis Batch: 97735

Client Sample ID: UDEX-VP-1A-19-20210223
Prep Type: Total/NA
Prep Batch: 97494

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
DRO (C10-C28)	ND	FH		ND		mg/Kg	☼			NC	20

Surrogate	*DU %Recovery*	*DU Qualifier*	*Limits*
o- terphenyl (Surr)	*99*		*42 - 143*

GC VOA

Prep Batch: 96691

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30049-1	UDEX-VP-1A-19-20210223	Total/NA	Solid	5035	
410-30049-2	UDEX-VP-1A-20-20210223	Total/NA	Solid	5035	
410-30049-3	UDEX-VP-1A-21-20210223	Total/NA	Solid	5035	
410-30049-4	UDEX-VP-1A-22-20210223	Total/NA	Solid	5035	
410-30049-5	UDEX-VP-1A-23-20210223	Total/NA	Solid	5035	
410-30049-6	UDEX-VP-1A-24-20210223	Total/NA	Solid	5035	
410-30049-7	UDEX-VP-1A-25-20210223	Total/NA	Solid	5035	

Analysis Batch: 97120

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30049-1	UDEX-VP-1A-19-20210223	Total/NA	Solid	8015D	96691
410-30049-2	UDEX-VP-1A-20-20210223	Total/NA	Solid	8015D	96691
410-30049-3	UDEX-VP-1A-21-20210223	Total/NA	Solid	8015D	96691
MB 410-97120/4	Method Blank	Total/NA	Solid	8015D	
LCS 410-97120/5	Lab Control Sample	Total/NA	Solid	8015D	
LCSD 410-97120/6	Lab Control Sample Dup	Total/NA	Solid	8015D	

Analysis Batch: 97410

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30049-4	UDEX-VP-1A-22-20210223	Total/NA	Solid	8015D	96691
410-30049-5	UDEX-VP-1A-23-20210223	Total/NA	Solid	8015D	96691
410-30049-6	UDEX-VP-1A-24-20210223	Total/NA	Solid	8015D	96691
410-30049-7	UDEX-VP-1A-25-20210223	Total/NA	Solid	8015D	96691
MB 410-97410/4	Method Blank	Total/NA	Solid	8015D	
LCS 410-97410/5	Lab Control Sample	Total/NA	Solid	8015D	
LCSD 410-97410/6	Lab Control Sample Dup	Total/NA	Solid	8015D	

GC Semi VOA

Prep Batch: 97494

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30049-1	UDEX-VP-1A-19-20210223	Total/NA	Solid	3546	
410-30049-2	UDEX-VP-1A-20-20210223	Total/NA	Solid	3546	
410-30049-3	UDEX-VP-1A-21-20210223	Total/NA	Solid	3546	
410-30049-4	UDEX-VP-1A-22-20210223	Total/NA	Solid	3546	
410-30049-5	UDEX-VP-1A-23-20210223	Total/NA	Solid	3546	
410-30049-6	UDEX-VP-1A-24-20210223	Total/NA	Solid	3546	
410-30049-7	UDEX-VP-1A-25-20210223	Total/NA	Solid	3546	
MB 410-97494/1-A	Method Blank	Total/NA	Solid	3546	
LCS 410-97494/2-A	Lab Control Sample	Total/NA	Solid	3546	
410-30049-1 MS	UDEX-VP-1A-19-20210223	Total/NA	Solid	3546	
410-30049-1 DU	UDEX-VP-1A-19-20210223	Total/NA	Solid	3546	

Analysis Batch: 97735

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30049-1	UDEX-VP-1A-19-20210223	Total/NA	Solid	8015D	97494
410-30049-2	UDEX-VP-1A-20-20210223	Total/NA	Solid	8015D	97494
410-30049-3	UDEX-VP-1A-21-20210223	Total/NA	Solid	8015D	97494
410-30049-4	UDEX-VP-1A-22-20210223	Total/NA	Solid	8015D	97494
410-30049-5	UDEX-VP-1A-23-20210223	Total/NA	Solid	8015D	97494
410-30049-6	UDEX-VP-1A-24-20210223	Total/NA	Solid	8015D	97494

GC Semi VOA (Continued)

Analysis Batch: 97735 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30049-7	UDEX-VP-1A-25-20210223	Total/NA	Solid	8015D	97494
MB 410-97494/1-A	Method Blank	Total/NA	Solid	8015D	97494
LCS 410-97494/2-A	Lab Control Sample	Total/NA	Solid	8015D	97494
410-30049-1 MS	UDEX-VP-1A-19-20210223	Total/NA	Solid	8015D	97494
410-30049-1 DU	UDEX-VP-1A-19-20210223	Total/NA	Solid	8015D	97494

General Chemistry

Analysis Batch: 96990

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30049-1	UDEX-VP-1A-19-20210223	Total/NA	Solid	Moisture	
410-30049-2	UDEX-VP-1A-20-20210223	Total/NA	Solid	Moisture	
410-30049-3	UDEX-VP-1A-21-20210223	Total/NA	Solid	Moisture	
410-30049-4	UDEX-VP-1A-22-20210223	Total/NA	Solid	Moisture	
410-30049-5	UDEX-VP-1A-23-20210223	Total/NA	Solid	Moisture	
410-30049-6	UDEX-VP-1A-24-20210223	Total/NA	Solid	Moisture	
410-30049-7	UDEX-VP-1A-25-20210223	Total/NA	Solid	Moisture	

Client Sample ID: UDEX-VP-1A-19-20210223 — **Lab Sample ID: 410-30049-1**
Date Collected: 02/23/21 09:30 — **Matrix: Solid**
Date Received: 02/23/21 15:58

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96990	02/24/21 13:05	UVJN	ELLE

Client Sample ID: UDEX-VP-1A-19-20210223 — **Lab Sample ID: 410-30049-1**
Date Collected: 02/23/21 09:30 — **Matrix: Solid**
Date Received: 02/23/21 15:58 — **Percent Solids: 91.8**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			96691	02/23/21 20:58	UK3O	ELLE
Total/NA	Analysis	8015D		100	97120	02/24/21 22:34	JJT8	ELLE
Total/NA	Prep	3546			97494	02/25/21 16:06	FTV5	ELLE
Total/NA	Analysis	8015D		1	97735	02/26/21 13:46	IUSB	ELLE

Client Sample ID: UDEX-VP-1A-20-20210223 — **Lab Sample ID: 410-30049-2**
Date Collected: 02/23/21 09:35 — **Matrix: Solid**
Date Received: 02/23/21 15:58

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96990	02/24/21 13:05	UVJN	ELLE

Client Sample ID: UDEX-VP-1A-20-20210223 — **Lab Sample ID: 410-30049-2**
Date Collected: 02/23/21 09:35 — **Matrix: Solid**
Date Received: 02/23/21 15:58 — **Percent Solids: 91.2**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			96691	02/23/21 20:58	UK3O	ELLE
Total/NA	Analysis	8015D		100	97120	02/24/21 23:10	JJT8	ELLE
Total/NA	Prep	3546			97494	02/25/21 16:06	FTV5	ELLE
Total/NA	Analysis	8015D		1	97735	02/26/21 14:58	IUSB	ELLE

Client Sample ID: UDEX-VP-1A-21-20210223 — **Lab Sample ID: 410-30049-3**
Date Collected: 02/23/21 11:40 — **Matrix: Solid**
Date Received: 02/23/21 15:58

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96990	02/24/21 13:05	UVJN	ELLE

Client Sample ID: UDEX-VP-1A-21-20210223 — **Lab Sample ID: 410-30049-3**
Date Collected: 02/23/21 11:40 — **Matrix: Solid**
Date Received: 02/23/21 15:58 — **Percent Solids: 91.2**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			96691	02/23/21 20:58	UK3O	ELLE
Total/NA	Analysis	8015D		100	97120	02/24/21 23:47	JJT8	ELLE
Total/NA	Prep	3546			97494	02/25/21 16:06	FTV5	ELLE
Total/NA	Analysis	8015D		1	97735	02/26/21 18:09	IUSB	ELLE

Client Sample ID: UDEX-VP-1A-22-20210223 — **Lab Sample ID: 410-30049-4**
Date Collected: 02/23/21 11:42 — **Matrix: Solid**
Date Received: 02/23/21 15:58

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96990	02/24/21 13:05	UVJN	ELLE

Client Sample ID: UDEX-VP-1A-22-20210223 — **Lab Sample ID: 410-30049-4**
Date Collected: 02/23/21 11:42 — **Matrix: Solid**
Date Received: 02/23/21 15:58 — **Percent Solids: 87.3**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			96691	02/23/21 20:58	UK3O	ELLE
Total/NA	Analysis	8015D		20000	97410	02/25/21 22:23	JJT8	ELLE
Total/NA	Prep	3546			97494	02/25/21 16:06	FTV5	ELLE
Total/NA	Analysis	8015D		5	97735	02/26/21 20:56	IUSB	ELLE

Client Sample ID: UDEX-VP-1A-23-20210223 — **Lab Sample ID: 410-30049-5**
Date Collected: 02/23/21 11:44 — **Matrix: Solid**
Date Received: 02/23/21 15:58

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96990	02/24/21 13:05	UVJN	ELLE

Client Sample ID: UDEX-VP-1A-23-20210223 — **Lab Sample ID: 410-30049-5**
Date Collected: 02/23/21 11:44 — **Matrix: Solid**
Date Received: 02/23/21 15:58 — **Percent Solids: 89.0**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			96691	02/23/21 20:58	UK3O	ELLE
Total/NA	Analysis	8015D		10000	97410	02/25/21 21:11	JJT8	ELLE
Total/NA	Prep	3546			97494	02/25/21 16:06	FTV5	ELLE
Total/NA	Analysis	8015D		5	97735	02/26/21 20:20	IUSB	ELLE

Client Sample ID: UDEX-VP-1A-24-20210223 — **Lab Sample ID: 410-30049-6**
Date Collected: 02/23/21 11:46 — **Matrix: Solid**
Date Received: 02/23/21 15:58

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96990	02/24/21 13:05	UVJN	ELLE

Client Sample ID: UDEX-VP-1A-24-20210223 — **Lab Sample ID: 410-30049-6**
Date Collected: 02/23/21 11:46 — **Matrix: Solid**
Date Received: 02/23/21 15:58 — **Percent Solids: 90.2**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			96691	02/23/21 20:58	UK3O	ELLE
Total/NA	Analysis	8015D		50000	97410	02/25/21 22:58	JJT8	ELLE
Total/NA	Prep	3546			97494	02/25/21 16:06	FTV5	ELLE
Total/NA	Analysis	8015D		10	97735	02/26/21 21:44	IUSB	ELLE

Lab Chronicle

Client: Stantec Consulting Corp.
Project/Site: UDEX

Job ID: 410-30049-1

Client Sample ID: UDEX-VP-1A-25-20210223 — **Lab Sample ID: 410-30049-7**
Date Collected: 02/23/21 11:48 — **Matrix: Solid**
Date Received: 02/23/21 15:58

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96990	02/24/21 13:05	UVJN	ELLE

Client Sample ID: UDEX-VP-1A-25-20210223 — **Lab Sample ID: 410-30049-7**
Date Collected: 02/23/21 11:48 — **Matrix: Solid**
Date Received: 02/23/21 15:58 — **Percent Solids: 85.9**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			96691	02/23/21 20:58	UK3O	ELLE
Total/NA	Analysis	8015D		10000	97410	02/25/21 21:47	JJT8	ELLE
Total/NA	Prep	3546			97494	02/25/21 16:06	FTV5	ELLE
Total/NA	Analysis	8015D		25	97735	02/26/21 22:08	IUSB	ELLE

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Stantec Consulting Corp.
Job ID: 410-30049-1
Project/Site: UDEX

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Pennsylvania	NELAP	36-00037	01-31-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture

Method Summary

Client: Stantec Consulting Corp.
Project/Site: UDEX

Job ID: 410-30049-1

Method	Method Description	Protocol	Laboratory
8015D	Gasoline Range Organics (GRO) (GC)	SW846	ELLE
8015D	Diesel Range Organics (DRO) (GC)	SW846	ELLE
Moisture	Percent Moisture	EPA	ELLE
3546	Microwave Extraction	SW846	ELLE
5035	Closed System Purge and Trap	SW846	ELLE

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: Stantec Consulting Corp.
Project/Site: UDEX

Job ID: 410-30049-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
410-30049-1	UDEX-VP-1A-19-20210223	Solid	02/23/21 09:30	02/23/21 15:58	
410-30049-2	UDEX-VP-1A-20-20210223	Solid	02/23/21 09:35	02/23/21 15:58	
410-30049-3	UDEX-VP-1A-21-20210223	Solid	02/23/21 11:40	02/23/21 15:58	
410-30049-4	UDEX-VP-1A-22-20210223	Solid	02/23/21 11:42	02/23/21 15:58	
410-30049-5	UDEX-VP-1A-23-20210223	Solid	02/23/21 11:44	02/23/21 15:58	
410-30049-6	UDEX-VP-1A-24-20210223	Solid	02/23/21 11:46	02/23/21 15:58	
410-30049-7	UDEX-VP-1A-25-20210223	Solid	02/23/21 11:48	02/23/21 15:58	

Environmental Analysis Chain of Custody

eurofins | Lancaster Laboratories Environmental

410-30049 Chain of Custody

Acct. # _____ Environmental use only File # _____

COC #616579

Client Information

Client: PES c/o Stantec	Acct. #: 42093
Project Name/#: UDEX	PWSID #:
Project Manager: Andrew Klingbeil	P.O. #: 213403039
Sampler: Jenny Kachel	Quote #:
State where samples were collected: PA	For Compliance: Yes ☐ No ☐

For Lab Use Only
FSC: _____
SCR#: 2258471

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 P=H_3PO_4
F=Field Filtered O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Matrix: Soil/Sediment	Water: Tissue	Water: Ground	Water: Potable	Water: Surface	Water: NPDES	Other:	Total # of Containers	Analysis Requested: TPH-DRO	Analysis Requested: TPH-GRO	Remarks
UDEX-VP-1A-19-20210223	2/23/21	0930	X		X							3	X	X	
UDEX-VP-1A-20-20210223	2/23/21	0935	X		X							3	X	X	
UDEX-VP-1A-21-20210223	2/23/21	1148	X		X							3	X	X	
UDEX-VP-1A-22-20210223	2/23/21	1142	X		X							3	X	X	
UDEX-VP-1A-23-20210223	2/23/21	1144	X		X							3	X	X	
UDEX-VP-1A-24-20210223	2/23/21	1146	X		X							3	X	X	
UDEX-VP-1A-25-20210223	2/23/21	1148	X		X							3	X	X	

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: _____

E-mail address: andrew.klingbeil@stantec.com

Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) NJ DKQP TX TRRP-13
NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	2/23/21	1350	Pierre	2/23/21	1350
Pierre	2/23/21	1530			
			Sulistrak	2/23/21	15:58

EDD Required? (Yes) No
If yes, format: EQuIS

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS _____ FedEx _____ Other _____

Temperature upon receipt 5.1 °C

Login Sample Receipt Checklist

Client: Stantec Consulting Corp.

Job Number: 410-30049-1

Login Number: 30049

List Source: Eurofins Lancaster Laboratories Env

List Number: 1

Creator: Jeremiah, Cory T

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	N/A	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified.	N/A	
Residual Chlorine Checked.	N/A	
Sample custody seals are intact.	N/A	

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ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Tel: (717)656-2300

Laboratory Job ID: 410-30412-1
Client Project/Site: Udex ICE Pilot System Install

For:
Stantec Consulting Corp.
1060 Andrew Drive
Suite 140
West Chester, Pennsylvania 19380

Attn: Andrew Klingbeil

Authorized for release by:
3/4/2021 12:52:23 PM

Amek Carter, Project Manager
(717)556-7252
Loran.Carter@eurofinset.com

LINKS

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www.eurofinsus.com/Env

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

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Amek Carter
Project Manager
3/4/2021 12:52:23 PM

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Client: Stantec Consulting Corp.
Job ID: 410-30412-1
Project/Site: Udex ICE Pilot System Install

Qualifiers

GC VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
S1+	Surrogate recovery exceeds control limits, high biased.

GC Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Stantec Consulting Corp.
Project/Site: Udex ICE Pilot System Install

Job ID: 410-30412-1

Job ID: 410-30412-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Narrative

Job Narrative
410-30412-1

Receipt
The samples were received on 2/25/2021 7:25 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 1.0°C

Gasoline Range Organics
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Diesel Range Organics
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: Stantec Consulting Corp.
Project/Site: Udex ICE Pilot System Install

Job ID: 410-30412-1

Client Sample ID: UDEX-VP-3A-17-20210224 — Lab Sample ID: 410-30412-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	11000		1000	190	mg/Kg	25000	☼	8015D	Total/NA

Client Sample ID: UDEX-VP-3A-18-20210224 — Lab Sample ID: 410-30412-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	14000		880	160	mg/Kg	20000	☼	8015D	Total/NA

Client Sample ID: UDEX-VP-3A-19-20210224 — Lab Sample ID: 410-30412-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	7400		880	160	mg/Kg	20000	☼	8015D	Total/NA

Client Sample ID: UDEX-VP-3A-20-20210224 — Lab Sample ID: 410-30412-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	110		4.7	0.84	mg/Kg	100	☼	8015D	Total/NA

Client Sample ID: UDEX-VP-3C-18-20210224 — Lab Sample ID: 410-30412-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	6.9		1.2	0.21	mg/Kg	25	☼	8015D	Total/NA

Client Sample ID: UDEX-VP-3C-19-20210224 — Lab Sample ID: 410-30412-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	460		77	14	mg/Kg	2000	☼	8015D	Total/NA

Client Sample ID: UDEX-VP-3C-20-20210224 — Lab Sample ID: 410-30412-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	460		45	8.1	mg/Kg	1000	☼	8015D	Total/NA
DRO (C10-C28)	10	J	13	5.4	mg/Kg	1	☼	8015D	Total/NA

Client Sample ID: UDEX-VP--3C-21-20210224 — Lab Sample ID: 410-30412-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	1.3		1.0	0.19	mg/Kg	25	☼	8015D	Total/NA

Client Sample ID: UDEX-VP-3C-22-20210224 — Lab Sample ID: 410-30412-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	3.1		1.1	0.20	mg/Kg	25	☼	8015D	Total/NA

Client Sample ID: UDEX-VP-3C-23-20210224 — Lab Sample ID: 410-30412-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	66		4.2	0.76	mg/Kg	100	☼	8015D	Total/NA

Client Sample ID: UDEX-VP-2A-13-20210224 — Lab Sample ID: 410-30412-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	0.81	J	1.1	0.20	mg/Kg	25	☼	8015D	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Stantec Consulting Corp.
Job ID: 410-30412-1
Project/Site: Udex ICE Pilot System Install

Client Sample ID: UDEX-VP-2A-14-20210224 — Lab Sample ID: 410-30412-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	0.39	J	1.1	0.19	mg/Kg	25	☼	8015D	Total/NA

Client Sample ID: UDEX-VP-2A-15-20210224 — Lab Sample ID: 410-30412-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	49000		4800	860	mg/Kg	100000	☼	8015D	Total/NA
DRO (C10-C28)	29		13	5.4	mg/Kg	1	☼	8015D	Total/NA

Client Sample ID: UDEX-VP-2A-16-20210224 — Lab Sample ID: 410-30412-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	4800		210	38	mg/Kg	5000	☼	8015D	Total/NA
DRO (C10-C28)	8.3	J	14	5.8	mg/Kg	1	☼	8015D	Total/NA

Client Sample ID: UDEX-VP-2A-17-20210224 — Lab Sample ID: 410-30412-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	18000		2300	410	mg/Kg	50000	☼	8015D	Total/NA
DRO (C10-C28)	6.1	J	13	5.6	mg/Kg	1	☼	8015D	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: UDEX-VP-3A-17-20210224
Lab Sample ID: 410-30412-1

Date Collected: 02/24/21 11:20
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 90.0

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	11000		1000	190	mg/Kg	☼	02/26/21 09:05	03/03/21 01:38	25000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*1438*	*S1+*	*50 - 142*	*02/26/21 09:05*	*03/03/21 01:38*	*25000*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		13	5.5	mg/Kg	☼	03/01/21 18:20	03/02/21 11:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*96*		*42 - 143*	*03/01/21 18:20*	*03/02/21 11:46*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	10		1.0	1.0	%			02/26/21 00:27	1

Client Sample ID: UDEX-VP-3A-18-20210224
Lab Sample ID: 410-30412-2

Date Collected: 02/24/21 11:22
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 89.0

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	14000		880	160	mg/Kg	☼	02/26/21 09:05	03/03/21 03:27	20000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*1255*	*S1+*	*50 - 142*	*02/26/21 09:05*	*03/03/21 03:27*	*20000*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		13	5.6	mg/Kg	☼	03/01/21 18:20	03/02/21 12:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*104*		*42 - 143*	*03/01/21 18:20*	*03/02/21 12:10*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	11.0		1.0	1.0	%			02/26/21 00:27	1

Client Sample ID: UDEX-VP-3A-19-20210224
Lab Sample ID: 410-30412-3

Date Collected: 02/24/21 11:24
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 90.0

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	7400		880	160	mg/Kg	☼	02/26/21 09:05	03/03/21 02:15	20000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*500*	*S1+*	*50 - 142*	*02/26/21 09:05*	*03/03/21 02:15*	*20000*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		13	5.5	mg/Kg	☼	03/01/21 18:20	03/02/21 12:34	1

Client Sample ID: UDEX-VP-3A-19-20210224
Lab Sample ID: 410-30412-3

Date Collected: 02/24/21 11:24
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 90.0

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*101*		*42 - 143*	*03/01/21 18:20*	*03/02/21 12:34*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**10.0**		1.0	1.0	%			02/26/21 00:27	1

Client Sample ID: UDEX-VP-3A-20-20210224
Lab Sample ID: 410-30412-4

Date Collected: 02/24/21 11:26
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 87.7

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	**110**		4.7	0.84	mg/Kg	☼	02/26/21 09:05	03/02/21 21:55	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*106*		*50 - 142*	*02/26/21 09:05*	*03/02/21 21:55*	*100*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		14	5.7	mg/Kg	☼	03/01/21 18:20	03/02/21 12:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*95*		*42 - 143*	*03/01/21 18:20*	*03/02/21 12:58*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**12.3**		1.0	1.0	%			02/26/21 00:27	1

Client Sample ID: UDEX-VP-3C-18-20210224
Lab Sample ID: 410-30412-5

Date Collected: 02/24/21 13:00
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 91.4

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	**6.9**		1.2	0.21	mg/Kg	☼	02/26/21 09:05	03/01/21 16:46	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*81*		*50 - 142*	*02/26/21 09:05*	*03/01/21 16:46*	*25*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		13	5.4	mg/Kg	☼	03/01/21 18:20	03/02/21 13:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*103*		*42 - 143*	*03/01/21 18:20*	*03/02/21 13:23*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**8.6**		1.0	1.0	%			02/26/21 00:27	1

Client Sample ID: UDEX-VP-3C-19-20210224
Lab Sample ID: 410-30412-6

Date Collected: 02/24/21 13:05
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 92.7

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	460		77	14	mg/Kg	☼	02/26/21 09:05	03/03/21 02:51	2000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*125*		*50 - 142*	*02/26/21 09:05*	*03/03/21 02:51*	*2000*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		13	5.3	mg/Kg	☼	03/01/21 18:20	03/02/21 13:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*104*		*42 - 143*	*03/01/21 18:20*	*03/02/21 13:47*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	7.3		1.0	1.0	%			02/26/21 00:27	1

Client Sample ID: UDEX-VP-3C-20-20210224
Lab Sample ID: 410-30412-7

Date Collected: 02/24/21 13:10
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 90.4

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	460		45	8.1	mg/Kg	☼	02/26/21 09:05	03/03/21 05:22	1000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*127*		*50 - 142*	*02/26/21 09:05*	*03/03/21 05:22*	*1000*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	10	J	13	5.4	mg/Kg	☼	03/01/21 18:20	03/03/21 04:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*104*		*42 - 143*	*03/01/21 18:20*	*03/03/21 04:32*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	9.6		1.0	1.0	%			02/26/21 00:27	1

Client Sample ID: UDEX-VP--3C-21-20210224
Lab Sample ID: 410-30412-8

Date Collected: 02/24/21 13:12
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 90.2

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	1.3		1.0	0.19	mg/Kg	☼	02/26/21 09:05	03/01/21 17:22	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*84*		*50 - 142*	*02/26/21 09:05*	*03/01/21 17:22*	*25*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		13	5.5	mg/Kg	☼	03/01/21 18:20	03/02/21 14:11	1

Client Sample ID: UDEX-VP--3C-21-20210224
Lab Sample ID: 410-30412-8

Date Collected: 02/24/21 13:12
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 90.2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*99*		*42 - 143*	*03/01/21 18:20*	*03/02/21 14:11*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**9.8**		1.0	1.0	%			02/26/21 00:27	1

Client Sample ID: UDEX-VP-3C-22-20210224
Lab Sample ID: 410-30412-9

Date Collected: 02/24/21 13:14
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 89.8

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	**3.1**		1.1	0.20	mg/Kg	☼	02/26/21 09:05	03/01/21 17:58	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*72*		*50 - 142*	*02/26/21 09:05*	*03/01/21 17:58*	*25*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		13	5.5	mg/Kg	☼	03/01/21 18:20	03/02/21 14:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*99*		*42 - 143*	*03/01/21 18:20*	*03/02/21 14:35*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**10.2**		1.0	1.0	%			02/26/21 00:27	1

Client Sample ID: UDEX-VP-3C-23-20210224
Lab Sample ID: 410-30412-10

Date Collected: 02/24/21 13:16
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 88.6

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	**66**		4.2	0.76	mg/Kg	☼	02/26/21 09:05	03/02/21 22:31	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*94*		*50 - 142*	*02/26/21 09:05*	*03/02/21 22:31*	*100*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		13	5.6	mg/Kg	☼	03/01/21 18:20	03/02/21 14:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*103*		*42 - 143*	*03/01/21 18:20*	*03/02/21 14:59*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**11.4**		1.0	1.0	%			02/26/21 00:27	1

Client Sample ID: UDEX-VP-2A-13-20210224
Lab Sample ID: 410-30412-11

Date Collected: 02/24/21 16:20
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 93.6

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	0.81	J	1.1	0.20	mg/Kg	☼	02/26/21 09:05	03/01/21 18:41	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*73*		*50 - 142*	*02/26/21 09:05*	*03/01/21 18:41*	*25*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		13	5.3	mg/Kg	☼	03/01/21 18:20	03/02/21 15:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*98*		*42 - 143*	*03/01/21 18:20*	*03/02/21 15:23*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	6.4		1.0	1.0	%			02/26/21 00:27	1

Client Sample ID: UDEX-VP-2A-14-20210224
Lab Sample ID: 410-30412-12

Date Collected: 02/24/21 16:22
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 96.3

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	0.39	J	1.1	0.19	mg/Kg	☼	02/26/21 09:05	03/01/21 19:17	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*78*		*50 - 142*	*02/26/21 09:05*	*03/01/21 19:17*	*25*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		12	5.1	mg/Kg	☼	03/01/21 18:20	03/03/21 03:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*95*		*42 - 143*	*03/01/21 18:20*	*03/03/21 03:19*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	3.7		1.0	1.0	%			02/26/21 00:27	1

Client Sample ID: UDEX-VP-2A-15-20210224
Lab Sample ID: 410-30412-13

Date Collected: 02/24/21 16:24
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 92.0

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	49000		4800	860	mg/Kg	☼	02/26/21 09:05	03/03/21 05:58	100000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*3350*	*S1+*	*50 - 142*	*02/26/21 09:05*	*03/03/21 05:58*	*100000*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	29		13	5.4	mg/Kg	☼	03/01/21 18:20	03/03/21 04:56	1

Client Sample ID: UDEX-VP-2A-15-20210224
Lab Sample ID: 410-30412-13

Date Collected: 02/24/21 16:24
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 92.0

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o- terphenyl (Surr)	*107*		*42 - 143*	*03/01/21 18:20*	*03/03/21 04:56*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**8.0**		1.0	1.0	%			02/26/21 00:27	1

Client Sample ID: UDEX-VP-2A-16-20210224
Lab Sample ID: 410-30412-14

Date Collected: 02/24/21 16:26
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 86.7

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	**4800**		210	38	mg/Kg	☼	02/26/21 09:05	03/02/21 23:07	5000

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene (fid) (1C)	*462*	*S1+*	*50 - 142*	*02/26/21 09:05*	*03/02/21 23:07*	*5000*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	**8.3**	**J**	14	5.8	mg/Kg	☼	03/01/21 18:20	03/03/21 03:43	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o- terphenyl (Surr)	*49*		*42 - 143*	*03/01/21 18:20*	*03/03/21 03:43*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**13.3**		1.0	1.0	%			02/26/21 00:27	1

Client Sample ID: UDEX-VP-2A-17-20210224
Lab Sample ID: 410-30412-15

Date Collected: 02/24/21 16:28
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 88.7

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	**18000**		2300	410	mg/Kg	☼	02/26/21 09:05	03/03/21 06:34	50000

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene (fid) (1C)	*28319*	*S1+*	*50 - 142*	*02/26/21 09:05*	*03/03/21 06:34*	*50000*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	**6.1**	**J**	13	5.6	mg/Kg	☼	03/01/21 18:20	03/03/21 04:08	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o- terphenyl (Surr)	*96*		*42 - 143*	*03/01/21 18:20*	*03/03/21 04:08*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**11.3**		1.0	1.0	%			02/26/21 00:27	1

Surrogate Summary

Client: Stantec Consulting Corp.
Job ID: 410-30412-1
Project/Site: Udex ICE Pilot System Install

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Matrix: Solid
Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)						
		TFT-F1						
Lab Sample ID	Client Sample ID	(50-142)						
410-30412-1	UDEX-VP-3A-17-20210224	1438 S1+						
410-30412-2	UDEX-VP-3A-18-20210224	1255 S1+						
410-30412-3	UDEX-VP-3A-19-20210224	500 S1+						
410-30412-4	UDEX-VP-3A-20-20210224	106						
410-30412-5	UDEX-VP-3C-18-20210224	81						
410-30412-6	UDEX-VP-3C-19-20210224	125						
410-30412-7	UDEX-VP-3C-20-20210224	127						
410-30412-8	UDEX-VP--3C-21-20210224	84						
410-30412-9	UDEX-VP-3C-22-20210224	72						
410-30412-10	UDEX-VP-3C-23-20210224	94						
410-30412-11	UDEX-VP-2A-13-20210224	73						
410-30412-12	UDEX-VP-2A-14-20210224	78						
410-30412-13	UDEX-VP-2A-15-20210224	3350 S1+						
410-30412-14	UDEX-VP-2A-16-20210224	462 S1+						
410-30412-15	UDEX-VP-2A-17-20210224	28319 S1+						
LCS 410-98215/5	Lab Control Sample	101						
LCS 410-98839/5	Lab Control Sample	96						
LCSD 410-98215/6	Lab Control Sample Dup	92						
LCSD 410-98839/6	Lab Control Sample Dup	92						
MB 410-98215/4	Method Blank	91						
MB 410-98839/4	Method Blank	94						

Surrogate Legend

TFT-F = a,a,a-Trifluorotoluene (fid)

Method: 8015D - Diesel Range Organics (DRO) (GC)

Matrix: Solid
Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)						
		OTP						
Lab Sample ID	Client Sample ID	(42-143)						
410-30412-1	UDEX-VP-3A-17-20210224	96						
410-30412-2	UDEX-VP-3A-18-20210224	104						
410-30412-3	UDEX-VP-3A-19-20210224	101						
410-30412-4	UDEX-VP-3A-20-20210224	95						
410-30412-5	UDEX-VP-3C-18-20210224	103						
410-30412-6	UDEX-VP-3C-19-20210224	104						
410-30412-7	UDEX-VP-3C-20-20210224	104						
410-30412-8	UDEX-VP--3C-21-20210224	99						
410-30412-9	UDEX-VP-3C-22-20210224	99						
410-30412-10	UDEX-VP-3C-23-20210224	103						
410-30412-11	UDEX-VP-2A-13-20210224	98						
410-30412-12	UDEX-VP-2A-14-20210224	95						
410-30412-13	UDEX-VP-2A-15-20210224	107						
410-30412-14	UDEX-VP-2A-16-20210224	49						
410-30412-15	UDEX-VP-2A-17-20210224	96						
LCS 410-98367/2-A	Lab Control Sample	107						
MB 410-98367/1-A	Method Blank	108						

Surrogate Legend

Surrogate Summary

Client: Stantec Consulting Corp.
Job ID: 410-30412-1
Project/Site: Udex ICE Pilot System Install

OTP = o- terphenyl (Surr)

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Lab Sample ID: MB 410-98215/4
Matrix: Solid
Analysis Batch: 98215

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	ND		1.0	0.18	mg/Kg			03/01/21 13:39	25

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*91*		*50 - 142*		*03/01/21 13:39*	*25*

Lab Sample ID: LCS 410-98215/5
Matrix: Solid
Analysis Batch: 98215

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (1C)			11.0	9.51		mg/Kg		86	60 - 132		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*101*		*50 - 142*

Lab Sample ID: LCSD 410-98215/6
Matrix: Solid
Analysis Batch: 98215

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (1C)			11.0	9.53		mg/Kg		87	60 - 132	0	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*92*		*50 - 142*

Lab Sample ID: MB 410-98839/4
Matrix: Solid
Analysis Batch: 98839

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	ND		1.0	0.18	mg/Kg			03/02/21 20:00	25

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*94*		*50 - 142*		*03/02/21 20:00*	*25*

Lab Sample ID: LCS 410-98839/5
Matrix: Solid
Analysis Batch: 98839

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (1C)			11.0	10.3		mg/Kg		93	60 - 132		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*96*		*50 - 142*

Method: 8015D - Gasoline Range Organics (GRO) (GC) (Continued)

Lab Sample ID: LCSD 410-98839/6
Matrix: Solid
Analysis Batch: 98839

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (1C)			11.0	9.86		mg/Kg		90	60 - 132	4	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*92*		*50 - 142*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 410-98367/1-A
Matrix: Solid
Analysis Batch: 98559

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 98367

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		12	5.0	mg/Kg		03/01/21 18:20	03/02/21 10:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*108*		*42 - 143*	*03/01/21 18:20*	*03/02/21 10:57*	*1*

Lab Sample ID: LCS 410-98367/2-A
Matrix: Solid
Analysis Batch: 98559

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 98367

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
DRO (C10-C28)			134	134		mg/Kg		100	76 - 117

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o- terphenyl (Surr)	*107*		*42 - 143*

GC VOA

Prep Batch: 97709

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30412-1	UDEX-VP-3A-17-20210224	Total/NA	Solid	5035	
410-30412-2	UDEX-VP-3A-18-20210224	Total/NA	Solid	5035	
410-30412-3	UDEX-VP-3A-19-20210224	Total/NA	Solid	5035	
410-30412-4	UDEX-VP-3A-20-20210224	Total/NA	Solid	5035	
410-30412-5	UDEX-VP-3C-18-20210224	Total/NA	Solid	5035	
410-30412-6	UDEX-VP-3C-19-20210224	Total/NA	Solid	5035	
410-30412-7	UDEX-VP-3C-20-20210224	Total/NA	Solid	5035	
410-30412-8	UDEX-VP--3C-21-20210224	Total/NA	Solid	5035	
410-30412-9	UDEX-VP-3C-22-20210224	Total/NA	Solid	5035	
410-30412-10	UDEX-VP-3C-23-20210224	Total/NA	Solid	5035	
410-30412-11	UDEX-VP-2A-13-20210224	Total/NA	Solid	5035	
410-30412-12	UDEX-VP-2A-14-20210224	Total/NA	Solid	5035	
410-30412-13	UDEX-VP-2A-15-20210224	Total/NA	Solid	5035	
410-30412-14	UDEX-VP-2A-16-20210224	Total/NA	Solid	5035	
410-30412-15	UDEX-VP-2A-17-20210224	Total/NA	Solid	5035	

Analysis Batch: 98215

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30412-5	UDEX-VP-3C-18-20210224	Total/NA	Solid	8015D	97709
410-30412-8	UDEX-VP--3C-21-20210224	Total/NA	Solid	8015D	97709
410-30412-9	UDEX-VP-3C-22-20210224	Total/NA	Solid	8015D	97709
410-30412-11	UDEX-VP-2A-13-20210224	Total/NA	Solid	8015D	97709
410-30412-12	UDEX-VP-2A-14-20210224	Total/NA	Solid	8015D	97709
MB 410-98215/4	Method Blank	Total/NA	Solid	8015D	
LCS 410-98215/5	Lab Control Sample	Total/NA	Solid	8015D	
LCSD 410-98215/6	Lab Control Sample Dup	Total/NA	Solid	8015D	

Analysis Batch: 98839

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30412-1	UDEX-VP-3A-17-20210224	Total/NA	Solid	8015D	97709
410-30412-2	UDEX-VP-3A-18-20210224	Total/NA	Solid	8015D	97709
410-30412-3	UDEX-VP-3A-19-20210224	Total/NA	Solid	8015D	97709
410-30412-4	UDEX-VP-3A-20-20210224	Total/NA	Solid	8015D	97709
410-30412-6	UDEX-VP-3C-19-20210224	Total/NA	Solid	8015D	97709
410-30412-7	UDEX-VP-3C-20-20210224	Total/NA	Solid	8015D	97709
410-30412-10	UDEX-VP-3C-23-20210224	Total/NA	Solid	8015D	97709
410-30412-13	UDEX-VP-2A-15-20210224	Total/NA	Solid	8015D	97709
410-30412-14	UDEX-VP-2A-16-20210224	Total/NA	Solid	8015D	97709
410-30412-15	UDEX-VP-2A-17-20210224	Total/NA	Solid	8015D	97709
MB 410-98839/4	Method Blank	Total/NA	Solid	8015D	
LCS 410-98839/5	Lab Control Sample	Total/NA	Solid	8015D	
LCSD 410-98839/6	Lab Control Sample Dup	Total/NA	Solid	8015D	

GC Semi VOA

Prep Batch: 98367

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30412-1	UDEX-VP-3A-17-20210224	Total/NA	Solid	3546	
410-30412-2	UDEX-VP-3A-18-20210224	Total/NA	Solid	3546	
410-30412-3	UDEX-VP-3A-19-20210224	Total/NA	Solid	3546	
410-30412-4	UDEX-VP-3A-20-20210224	Total/NA	Solid	3546	

GC Semi VOA (Continued)

Prep Batch: 98367 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30412-5	UDEX-VP-3C-18-20210224	Total/NA	Solid	3546	
410-30412-6	UDEX-VP-3C-19-20210224	Total/NA	Solid	3546	
410-30412-7	UDEX-VP-3C-20-20210224	Total/NA	Solid	3546	
410-30412-8	UDEX-VP--3C-21-20210224	Total/NA	Solid	3546	
410-30412-9	UDEX-VP-3C-22-20210224	Total/NA	Solid	3546	
410-30412-10	UDEX-VP-3C-23-20210224	Total/NA	Solid	3546	
410-30412-11	UDEX-VP-2A-13-20210224	Total/NA	Solid	3546	
410-30412-12	UDEX-VP-2A-14-20210224	Total/NA	Solid	3546	
410-30412-13	UDEX-VP-2A-15-20210224	Total/NA	Solid	3546	
410-30412-14	UDEX-VP-2A-16-20210224	Total/NA	Solid	3546	
410-30412-15	UDEX-VP-2A-17-20210224	Total/NA	Solid	3546	
MB 410-98367/1-A	Method Blank	Total/NA	Solid	3546	
LCS 410-98367/2-A	Lab Control Sample	Total/NA	Solid	3546	

Analysis Batch: 98559

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30412-1	UDEX-VP-3A-17-20210224	Total/NA	Solid	8015D	98367
410-30412-2	UDEX-VP-3A-18-20210224	Total/NA	Solid	8015D	98367
410-30412-3	UDEX-VP-3A-19-20210224	Total/NA	Solid	8015D	98367
410-30412-4	UDEX-VP-3A-20-20210224	Total/NA	Solid	8015D	98367
410-30412-5	UDEX-VP-3C-18-20210224	Total/NA	Solid	8015D	98367
410-30412-6	UDEX-VP-3C-19-20210224	Total/NA	Solid	8015D	98367
410-30412-8	UDEX-VP--3C-21-20210224	Total/NA	Solid	8015D	98367
410-30412-9	UDEX-VP-3C-22-20210224	Total/NA	Solid	8015D	98367
410-30412-10	UDEX-VP-3C-23-20210224	Total/NA	Solid	8015D	98367
410-30412-11	UDEX-VP-2A-13-20210224	Total/NA	Solid	8015D	98367
MB 410-98367/1-A	Method Blank	Total/NA	Solid	8015D	98367
LCS 410-98367/2-A	Lab Control Sample	Total/NA	Solid	8015D	98367

Analysis Batch: 98950

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30412-7	UDEX-VP-3C-20-20210224	Total/NA	Solid	8015D	98367
410-30412-12	UDEX-VP-2A-14-20210224	Total/NA	Solid	8015D	98367
410-30412-13	UDEX-VP-2A-15-20210224	Total/NA	Solid	8015D	98367
410-30412-14	UDEX-VP-2A-16-20210224	Total/NA	Solid	8015D	98367
410-30412-15	UDEX-VP-2A-17-20210224	Total/NA	Solid	8015D	98367

General Chemistry

Analysis Batch: 97626

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30412-1	UDEX-VP-3A-17-20210224	Total/NA	Solid	Moisture	
410-30412-2	UDEX-VP-3A-18-20210224	Total/NA	Solid	Moisture	
410-30412-3	UDEX-VP-3A-19-20210224	Total/NA	Solid	Moisture	
410-30412-4	UDEX-VP-3A-20-20210224	Total/NA	Solid	Moisture	
410-30412-5	UDEX-VP-3C-18-20210224	Total/NA	Solid	Moisture	
410-30412-6	UDEX-VP-3C-19-20210224	Total/NA	Solid	Moisture	
410-30412-7	UDEX-VP-3C-20-20210224	Total/NA	Solid	Moisture	
410-30412-8	UDEX-VP--3C-21-20210224	Total/NA	Solid	Moisture	
410-30412-9	UDEX-VP-3C-22-20210224	Total/NA	Solid	Moisture	
410-30412-10	UDEX-VP-3C-23-20210224	Total/NA	Solid	Moisture	

General Chemistry (Continued)

Analysis Batch: 97626 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30412-11	UDEX-VP-2A-13-20210224	Total/NA	Solid	Moisture	
410-30412-12	UDEX-VP-2A-14-20210224	Total/NA	Solid	Moisture	
410-30412-13	UDEX-VP-2A-15-20210224	Total/NA	Solid	Moisture	
410-30412-14	UDEX-VP-2A-16-20210224	Total/NA	Solid	Moisture	
410-30412-15	UDEX-VP-2A-17-20210224	Total/NA	Solid	Moisture	

Client Sample ID: UDEX-VP-3A-17-20210224
Lab Sample ID: 410-30412-1
Date Collected: 02/24/21 11:20
Matrix: Solid
Date Received: 02/25/21 19:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97626	02/26/21 00:27	PTG7	ELLE

Client Sample ID: UDEX-VP-3A-17-20210224
Lab Sample ID: 410-30412-1
Date Collected: 02/24/21 11:20
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 90.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97709	02/26/21 09:05	Z8FW	ELLE
Total/NA	Analysis	8015D		25000	98839	03/03/21 01:38	UMDJ	ELLE
Total/NA	Prep	3546			98367	03/01/21 18:20	QQ3P	ELLE
Total/NA	Analysis	8015D		1	98559	03/02/21 11:46	IUSB	ELLE

Client Sample ID: UDEX-VP-3A-18-20210224
Lab Sample ID: 410-30412-2
Date Collected: 02/24/21 11:22
Matrix: Solid
Date Received: 02/25/21 19:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97626	02/26/21 00:27	PTG7	ELLE

Client Sample ID: UDEX-VP-3A-18-20210224
Lab Sample ID: 410-30412-2
Date Collected: 02/24/21 11:22
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 89.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97709	02/26/21 09:05	Z8FW	ELLE
Total/NA	Analysis	8015D		20000	98839	03/03/21 03:27	UMDJ	ELLE
Total/NA	Prep	3546			98367	03/01/21 18:20	QQ3P	ELLE
Total/NA	Analysis	8015D		1	98559	03/02/21 12:10	IUSB	ELLE

Client Sample ID: UDEX-VP-3A-19-20210224
Lab Sample ID: 410-30412-3
Date Collected: 02/24/21 11:24
Matrix: Solid
Date Received: 02/25/21 19:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97626	02/26/21 00:27	PTG7	ELLE

Client Sample ID: UDEX-VP-3A-19-20210224
Lab Sample ID: 410-30412-3
Date Collected: 02/24/21 11:24
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 90.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97709	02/26/21 09:05	Z8FW	ELLE
Total/NA	Analysis	8015D		20000	98839	03/03/21 02:15	UMDJ	ELLE
Total/NA	Prep	3546			98367	03/01/21 18:20	QQ3P	ELLE
Total/NA	Analysis	8015D		1	98559	03/02/21 12:34	IUSB	ELLE

Client Sample ID: UDEX-VP-3A-20-20210224
Lab Sample ID: 410-30412-4

Date Collected: 02/24/21 11:26
Matrix: Solid
Date Received: 02/25/21 19:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97626	02/26/21 00:27	PTG7	ELLE

Client Sample ID: UDEX-VP-3A-20-20210224
Lab Sample ID: 410-30412-4

Date Collected: 02/24/21 11:26
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 87.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97709	02/26/21 09:05	Z8FW	ELLE
Total/NA	Analysis	8015D		100	98839	03/02/21 21:55	UMDJ	ELLE
Total/NA	Prep	3546			98367	03/01/21 18:20	QQ3P	ELLE
Total/NA	Analysis	8015D		1	98559	03/02/21 12:58	IUSB	ELLE

Client Sample ID: UDEX-VP-3C-18-20210224
Lab Sample ID: 410-30412-5

Date Collected: 02/24/21 13:00
Matrix: Solid
Date Received: 02/25/21 19:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97626	02/26/21 00:27	PTG7	ELLE

Client Sample ID: UDEX-VP-3C-18-20210224
Lab Sample ID: 410-30412-5

Date Collected: 02/24/21 13:00
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 91.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97709	02/26/21 09:05	Z8FW	ELLE
Total/NA	Analysis	8015D		25	98215	03/01/21 16:46	JJT8	ELLE
Total/NA	Prep	3546			98367	03/01/21 18:20	QQ3P	ELLE
Total/NA	Analysis	8015D		1	98559	03/02/21 13:23	IUSB	ELLE

Client Sample ID: UDEX-VP-3C-19-20210224
Lab Sample ID: 410-30412-6

Date Collected: 02/24/21 13:05
Matrix: Solid
Date Received: 02/25/21 19:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97626	02/26/21 00:27	PTG7	ELLE

Client Sample ID: UDEX-VP-3C-19-20210224
Lab Sample ID: 410-30412-6

Date Collected: 02/24/21 13:05
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 92.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97709	02/26/21 09:05	Z8FW	ELLE
Total/NA	Analysis	8015D		2000	98839	03/03/21 02:51	UMDJ	ELLE
Total/NA	Prep	3546			98367	03/01/21 18:20	QQ3P	ELLE
Total/NA	Analysis	8015D		1	98559	03/02/21 13:47	IUSB	ELLE

Client Sample ID: UDEX-VP-3C-20-20210224 — **Lab Sample ID: 410-30412-7**
Date Collected: 02/24/21 13:10 — **Matrix: Solid**
Date Received: 02/25/21 19:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97626	02/26/21 00:27	PTG7	ELLE

Client Sample ID: UDEX-VP-3C-20-20210224 — **Lab Sample ID: 410-30412-7**
Date Collected: 02/24/21 13:10 — **Matrix: Solid**
Date Received: 02/25/21 19:25 — **Percent Solids: 90.4**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97709	02/26/21 09:05	Z8FW	ELLE
Total/NA	Analysis	8015D		1000	98839	03/03/21 05:22	UMDJ	ELLE
Total/NA	Prep	3546			98367	03/01/21 18:20	QQ3P	ELLE
Total/NA	Analysis	8015D		1	98950	03/03/21 04:32	KP5X	ELLE

Client Sample ID: UDEX-VP--3C-21-20210224 — **Lab Sample ID: 410-30412-8**
Date Collected: 02/24/21 13:12 — **Matrix: Solid**
Date Received: 02/25/21 19:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97626	02/26/21 00:27	PTG7	ELLE

Client Sample ID: UDEX-VP--3C-21-20210224 — **Lab Sample ID: 410-30412-8**
Date Collected: 02/24/21 13:12 — **Matrix: Solid**
Date Received: 02/25/21 19:25 — **Percent Solids: 90.2**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97709	02/26/21 09:05	Z8FW	ELLE
Total/NA	Analysis	8015D		25	98215	03/01/21 17:22	JJT8	ELLE
Total/NA	Prep	3546			98367	03/01/21 18:20	QQ3P	ELLE
Total/NA	Analysis	8015D		1	98559	03/02/21 14:11	IUSB	ELLE

Client Sample ID: UDEX-VP-3C-22-20210224 — **Lab Sample ID: 410-30412-9**
Date Collected: 02/24/21 13:14 — **Matrix: Solid**
Date Received: 02/25/21 19:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97626	02/26/21 00:27	PTG7	ELLE

Client Sample ID: UDEX-VP-3C-22-20210224 — **Lab Sample ID: 410-30412-9**
Date Collected: 02/24/21 13:14 — **Matrix: Solid**
Date Received: 02/25/21 19:25 — **Percent Solids: 89.8**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97709	02/26/21 09:05	Z8FW	ELLE
Total/NA	Analysis	8015D		25	98215	03/01/21 17:58	JJT8	ELLE
Total/NA	Prep	3546			98367	03/01/21 18:20	QQ3P	ELLE
Total/NA	Analysis	8015D		1	98559	03/02/21 14:35	IUSB	ELLE

Client Sample ID: UDEX-VP-3C-23-20210224
Lab Sample ID: 410-30412-10
Date Collected: 02/24/21 13:16
Matrix: Solid
Date Received: 02/25/21 19:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97626	02/26/21 00:27	PTG7	ELLE

Client Sample ID: UDEX-VP-3C-23-20210224
Lab Sample ID: 410-30412-10
Date Collected: 02/24/21 13:16
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 88.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97709	02/26/21 09:05	Z8FW	ELLE
Total/NA	Analysis	8015D		100	98839	03/02/21 22:31	UMDJ	ELLE
Total/NA	Prep	3546			98367	03/01/21 18:20	QQ3P	ELLE
Total/NA	Analysis	8015D		1	98559	03/02/21 14:59	IUSB	ELLE

Client Sample ID: UDEX-VP-2A-13-20210224
Lab Sample ID: 410-30412-11
Date Collected: 02/24/21 16:20
Matrix: Solid
Date Received: 02/25/21 19:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97626	02/26/21 00:27	PTG7	ELLE

Client Sample ID: UDEX-VP-2A-13-20210224
Lab Sample ID: 410-30412-11
Date Collected: 02/24/21 16:20
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 93.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97709	02/26/21 09:05	Z8FW	ELLE
Total/NA	Analysis	8015D		25	98215	03/01/21 18:41	JJT8	ELLE
Total/NA	Prep	3546			98367	03/01/21 18:20	QQ3P	ELLE
Total/NA	Analysis	8015D		1	98559	03/02/21 15:23	IUSB	ELLE

Client Sample ID: UDEX-VP-2A-14-20210224
Lab Sample ID: 410-30412-12
Date Collected: 02/24/21 16:22
Matrix: Solid
Date Received: 02/25/21 19:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97626	02/26/21 00:27	PTG7	ELLE

Client Sample ID: UDEX-VP-2A-14-20210224
Lab Sample ID: 410-30412-12
Date Collected: 02/24/21 16:22
Matrix: Solid
Date Received: 02/25/21 19:25
Percent Solids: 96.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97709	02/26/21 09:05	Z8FW	ELLE
Total/NA	Analysis	8015D		25	98215	03/01/21 19:17	JJT8	ELLE
Total/NA	Prep	3546			98367	03/01/21 18:20	QQ3P	ELLE
Total/NA	Analysis	8015D		1	98950	03/03/21 03:19	KP5X	ELLE

Client Sample ID: UDEX-VP-2A-15-20210224 — **Lab Sample ID: 410-30412-13**
Date Collected: 02/24/21 16:24 — **Matrix: Solid**
Date Received: 02/25/21 19:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97626	02/26/21 00:27	PTG7	ELLE

Client Sample ID: UDEX-VP-2A-15-20210224 — **Lab Sample ID: 410-30412-13**
Date Collected: 02/24/21 16:24 — **Matrix: Solid**
Date Received: 02/25/21 19:25 — **Percent Solids: 92.0**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97709	02/26/21 09:05	Z8FW	ELLE
Total/NA	Analysis	8015D		100000	98839	03/03/21 05:58	UMDJ	ELLE
Total/NA	Prep	3546			98367	03/01/21 18:20	QQ3P	ELLE
Total/NA	Analysis	8015D		1	98950	03/03/21 04:56	KP5X	ELLE

Client Sample ID: UDEX-VP-2A-16-20210224 — **Lab Sample ID: 410-30412-14**
Date Collected: 02/24/21 16:26 — **Matrix: Solid**
Date Received: 02/25/21 19:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97626	02/26/21 00:27	PTG7	ELLE

Client Sample ID: UDEX-VP-2A-16-20210224 — **Lab Sample ID: 410-30412-14**
Date Collected: 02/24/21 16:26 — **Matrix: Solid**
Date Received: 02/25/21 19:25 — **Percent Solids: 86.7**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97709	02/26/21 09:05	Z8FW	ELLE
Total/NA	Analysis	8015D		5000	98839	03/02/21 23:07	UMDJ	ELLE
Total/NA	Prep	3546			98367	03/01/21 18:20	QQ3P	ELLE
Total/NA	Analysis	8015D		1	98950	03/03/21 03:43	KP5X	ELLE

Client Sample ID: UDEX-VP-2A-17-20210224 — **Lab Sample ID: 410-30412-15**
Date Collected: 02/24/21 16:28 — **Matrix: Solid**
Date Received: 02/25/21 19:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97626	02/26/21 00:27	PTG7	ELLE

Client Sample ID: UDEX-VP-2A-17-20210224 — **Lab Sample ID: 410-30412-15**
Date Collected: 02/24/21 16:28 — **Matrix: Solid**
Date Received: 02/25/21 19:25 — **Percent Solids: 88.7**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97709	02/26/21 09:05	Z8FW	ELLE
Total/NA	Analysis	8015D		50000	98839	03/03/21 06:34	UMDJ	ELLE
Total/NA	Prep	3546			98367	03/01/21 18:20	QQ3P	ELLE
Total/NA	Analysis	8015D		1	98950	03/03/21 04:08	KP5X	ELLE

Lab Chronicle

Client: Stantec Consulting Corp.
Job ID: 410-30412-1
Project/Site: Udex ICE Pilot System Install

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Stantec Consulting Corp.
Job ID: 410-30412-1
Project/Site: Udex ICE Pilot System Install

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Pennsylvania	NELAP	36-00037	01-31-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture

Method Summary

Client: Stantec Consulting Corp.
Job ID: 410-30412-1
Project/Site: Udex ICE Pilot System Install

Method	Method Description	Protocol	Laboratory
8015D	Gasoline Range Organics (GRO) (GC)	SW846	ELLE
8015D	Diesel Range Organics (DRO) (GC)	SW846	ELLE
Moisture	Percent Moisture	EPA	ELLE
3546	Microwave Extraction	SW846	ELLE
5035	Closed System Purge and Trap	SW846	ELLE

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: Stantec Consulting Corp.
Job ID: 410-30412-1
Project/Site: Udex ICE Pilot System Install

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
410-30412-1	UDEX-VP-3A-17-20210224	Solid	02/24/21 11:20	02/25/21 19:25	
410-30412-2	UDEX-VP-3A-18-20210224	Solid	02/24/21 11:22	02/25/21 19:25	
410-30412-3	UDEX-VP-3A-19-20210224	Solid	02/24/21 11:24	02/25/21 19:25	
410-30412-4	UDEX-VP-3A-20-20210224	Solid	02/24/21 11:26	02/25/21 19:25	
410-30412-5	UDEX-VP-3C-18-20210224	Solid	02/24/21 13:00	02/25/21 19:25	
410-30412-6	UDEX-VP-3C-19-20210224	Solid	02/24/21 13:05	02/25/21 19:25	
410-30412-7	UDEX-VP-3C-20-20210224	Solid	02/24/21 13:10	02/25/21 19:25	
410-30412-8	UDEX-VP--3C-21-20210224	Solid	02/24/21 13:12	02/25/21 19:25	
410-30412-9	UDEX-VP-3C-22-20210224	Solid	02/24/21 13:14	02/25/21 19:25	
410-30412-10	UDEX-VP-3C-23-20210224	Solid	02/24/21 13:16	02/25/21 19:25	
410-30412-11	UDEX-VP-2A-13-20210224	Solid	02/24/21 16:20	02/25/21 19:25	
410-30412-12	UDEX-VP-2A-14-20210224	Solid	02/24/21 16:22	02/25/21 19:25	
410-30412-13	UDEX-VP-2A-15-20210224	Solid	02/24/21 16:24	02/25/21 19:25	
410-30412-14	UDEX-VP-2A-16-20210224	Solid	02/24/21 16:26	02/25/21 19:25	
410-30412-15	UDEX-VP-2A-17-20210224	Solid	02/24/21 16:28	02/25/21 19:25	

Environmental Analysis Chain of Custody

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Acct. # ___

410-30412 Chain of Custody

ironmental use only

___

COC # 616580

Client Information

Client: PESRM	Acct. #: 420936 JK
Project Name/#: Udex ICE Pilot System Install	PWSID #:
Project Manager: Andrew Klingbeil	P.O. #: 213403039
Sampler: Jenny Kachel	Quote #:
State where samples were collected: PA	For Compliance: Yes ☐ No ☐

Matrix: Soil ☒ Sediment ☐ Tissue ☐ | Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐ | Other: ___

Analysis Requested — Preservation and Filtration Codes

For Lab Use Only
FSC: ___
SCR#: ___

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 P=H_3PO_4
F=Field Filtered O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	TPH-DRO	TPH-GRO	Remarks
UDEX-VP-3A-17-20210224	2/24/21	1120	X		3	X	X	
UDEX-VP-3A-18-20210224	2/24/21	1122	X		3	X	X	
UDEX-VP-3A-19-20210224	2/24/21	1124	X		3	X	X	
UDEX-VP-3A-20-20210224	2/24/21	1126	X		3	X	X	
UDEX-VP-3C-18-20210224	2/24/21	1300	X		3	X	X	
UDEX-VP-3C-19-20210224	2/24/21	1305	X		3	X	X	
UDEX-VP-3C-20-20210224	2/24/21	1310	X		3	X	X	
UDEX-VP-3C-21-20210224	2/24/21	1312	X		3	X	X	
UDEX-VP-3C-22-20210224	2/24/21	1314	X		3	X	X	
UDEX-VP-3C-23-20210224	2/24/21	1316	X		3	X	X	

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: ___

E-mail address: jenny.kachel@stantec.com

Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) NJ DKQP TX TRRP-13
NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	2/25/21	1202	Pierre	2/25/21	1202
Pierre	2/25/21	1900	[signature]		
			[signature]	2-25-21	1425

EDD Required? (Yes) No
If yes, format: EQUIS

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS ___ FedEx ___ Other ___

Temperature upon receipt 1.0 °C

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # _____ Group # _____ Sample # _____

COC # 615772

Client Information

Client: PESRM	Acct. #: 42093
Project Name/#: Udex ICE Pilot System Install	PWSID #:
Project Manager: Andrew Klingbeil	P.O. #: 213403039
Sampler: Jenny Kachel	Quote #:
State where samples were collected: PA	For Compliance: Yes ☐ No ☐

Matrix

Soil ☒ Sediment ☐ Tissue ☐ | Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐ | Other: ____

Analysis Requested

Preservation and Filtration Codes

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil/Sediment	Water	Other	Total # of Containers	TPH-DRO	TPH-GRO
UDEX-VP-2A-13-20210224	2/24/21	1620	X		X			3	X	X
UDEX-VP-2A-14-20210224	2/24/21	1622	X		X			3	X	X
UDEX-VP-2A-15-20210224	2/24/21	1624	X		X			3	X	X
UDEX-VP-2A-16-20210224	2/24/21	1626	X		X			3	X	X
UDEX-VP-2A-17-20210224	2/24/21	1628	X		X			3	X	X

For Lab Use Only
FSC: _____
SCR# 265862

Preservation Codes

H=HCl	T=Thiosulfate
N=HNO_3	B=NaOH
S=H_2SO_4	P=H_3PO_4
F=Field Filtered	O=Other

Remarks

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: _____

E-mail address: jenny.kachel@stantec.com

Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP) | Type VI (Raw Data Only)
Type III (Reduced non-CLP) | NJ DKQP | TX TRRP-13
NYSDEC Category A or B | MA MCP | CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	2/24/21	1202	Pierre	2/25/21	1207
Pierre	2/25/21	1906			

EDD Required? Yes No
If yes, format: EQuIS

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS _____ FedEx _____ Other _____

Temperature upon receipt 1.0 °C

Login Sample Receipt Checklist

Client: Stantec Consulting Corp.

Job Number: 410-30412-1

Login Number: 30412

List Source: Eurofins Lancaster Laboratories Env

List Number: 1

Creator: Sanchez, Melvin E

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	N/A	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified.	N/A	
Residual Chlorine Checked.	N/A	
Sample custody seals are intact.	N/A	

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ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Tel: (717)656-2300

Laboratory Job ID: 410-30633-1
Client Project/Site: PES UDEX Pilot System Instal

For:
Stantec Consulting Corp.
1060 Andrew Drive
Suite 140
West Chester, Pennsylvania 19380

Attn: Andrew Klingbeil

Authorized for release by:
3/5/2021 12:27:39 AM

Amek Carter, Project Manager
(717)556-7252
Loran.Carter@eurofinset.com

LINKS

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Results relate only to the items tested and the sample(s) as received by the laboratory.

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

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Amek Carter
Project Manager
3/5/2021 12:27:40 AM

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Definitions/Glossary

Client: Stantec Consulting Corp. Job ID: 410-30633-1
Project/Site: PES UDEX Pilot System Instal

Qualifiers

GC VOA

Qualifier	Qualifier Description
S1+	Surrogate recovery exceeds control limits, high biased.

GC Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 410-30633-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Narrative

Job Narrative
410-30633-1

Receipt
The samples were received on 2/26/2021 7:35 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 1.4°C

Gasoline Range Organics
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Diesel Range Organics
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: Stantec Consulting Corp.
Project/Site: PES UDEX Pilot System Instal

Job ID: 410-30633-1

Client Sample ID: UDEX-BH-21-01-9-20210225 — Lab Sample ID: 410-30633-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	3.1		0.91	0.16	mg/Kg	25	☼	8015D	Total/NA

Client Sample ID: UDEX-BH-21-01-10-20210225 — Lab Sample ID: 410-30633-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	100		19	3.4	mg/Kg	500	☼	8015D	Total/NA
DRO (C10-C28)	7.7	J	13	5.3	mg/Kg	1	☼	8015D	Total/NA

Client Sample ID: UDEX-BH-21-01-11-20210225 — Lab Sample ID: 410-30633-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	11000		830	150	mg/Kg	20000	☼	8015D	Total/NA
DRO (C10-C28)	5.7	J	13	5.3	mg/Kg	1	☼	8015D	Total/NA

Client Sample ID: UDEX-BH-21-01-12-20210225 — Lab Sample ID: 410-30633-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	5200		410	73	mg/Kg	10000	☼	8015D	Total/NA

Client Sample ID: UDEX-BH-21-01-13-20210225 — Lab Sample ID: 410-30633-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	5800		480	86	mg/Kg	10000	☼	8015D	Total/NA

Client Sample ID: UDEX-BH-21-01-14-20210225 — Lab Sample ID: 410-30633-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	410		21	3.9	mg/Kg	500	☼	8015D	Total/NA

Client Sample ID: UDEX-BH-21-01-15-20210225 — Lab Sample ID: 410-30633-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	24		1.2	0.21	mg/Kg	25	☼	8015D	Total/NA

Client Sample ID: UDEX-BH-21-01-16-20210225 — Lab Sample ID: 410-30633-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	50		5.4	0.97	mg/Kg	100	☼	8015D	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: UDEX-BH-21-01-9-20210225
Lab Sample ID: 410-30633-1

Date Collected: 02/25/21 16:30
Matrix: Solid
Date Received: 02/26/21 19:35
Percent Solids: 90.8

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	3.1		0.91	0.16	mg/Kg	☼	02/27/21 15:25	03/02/21 02:43	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*103*		*50 - 142*	*02/27/21 15:25*	*03/02/21 02:43*	*25*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		13	5.5	mg/Kg	☼	03/02/21 01:13	03/02/21 11:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*83*		*42 - 143*	*03/02/21 01:13*	*03/02/21 11:46*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	9.2		1.0	1.0	%			02/27/21 12:51	1

Client Sample ID: UDEX-BH-21-01-10-20210225
Lab Sample ID: 410-30633-2

Date Collected: 02/25/21 16:32
Matrix: Solid
Date Received: 02/26/21 19:35
Percent Solids: 93.6

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	100		19	3.4	mg/Kg	☼	02/27/21 15:25	03/03/21 07:53	500

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*92*		*50 - 142*	*02/27/21 15:25*	*03/03/21 07:53*	*500*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	7.7	J	13	5.3	mg/Kg	☼	03/02/21 01:13	03/02/21 14:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*87*		*42 - 143*	*03/02/21 01:13*	*03/02/21 14:11*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	6.4		1.0	1.0	%			02/27/21 12:51	1

Client Sample ID: UDEX-BH-21-01-11-20210225
Lab Sample ID: 410-30633-3

Date Collected: 02/25/21 16:34
Matrix: Solid
Date Received: 02/26/21 19:35
Percent Solids: 92.2

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	11000		830	150	mg/Kg	☼	02/27/21 15:25	03/02/21 06:56	20000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*584*	*S1+*	*50 - 142*	*02/27/21 15:25*	*03/02/21 06:56*	*20000*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	5.7	J	13	5.3	mg/Kg	☼	03/02/21 01:13	03/02/21 15:23	1

Client Sample ID: UDEX-BH-21-01-11-20210225
Lab Sample ID: 410-30633-3

Date Collected: 02/25/21 16:34
Matrix: Solid
Date Received: 02/26/21 19:35
Percent Solids: 92.2

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o- terphenyl (Surr)	*90*		*42 - 143*	*03/02/21 01:13*	*03/02/21 15:23*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**7.8**		1.0	1.0	%			02/27/21 12:51	1

Client Sample ID: UDEX-BH-21-01-12-20210225
Lab Sample ID: 410-30633-4

Date Collected: 02/25/21 16:36
Matrix: Solid
Date Received: 02/26/21 19:35
Percent Solids: 90.5

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	**5200**		410	73	mg/Kg	☼	02/27/21 15:25	03/03/21 00:19	10000

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene (fid) (1C)	*127*		*50 - 142*	*02/27/21 15:25*	*03/03/21 00:19*	*10000*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		13	5.4	mg/Kg	☼	03/02/21 01:13	03/02/21 12:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o- terphenyl (Surr)	*95*		*42 - 143*	*03/02/21 01:13*	*03/02/21 12:10*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**9.5**		1.0	1.0	%			02/27/21 12:51	1

Client Sample ID: UDEX-BH-21-01-13-20210225
Lab Sample ID: 410-30633-5

Date Collected: 02/25/21 16:38
Matrix: Solid
Date Received: 02/26/21 19:35
Percent Solids: 91.4

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	**5800**		480	86	mg/Kg	☼	02/27/21 15:25	03/03/21 08:29	10000

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene (fid) (1C)	*845*	*S1+*	*50 - 142*	*02/27/21 15:25*	*03/03/21 08:29*	*10000*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		19	7.7	mg/Kg	☼	03/02/21 01:13	03/02/21 12:34	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o- terphenyl (Surr)	*60*		*42 - 143*	*03/02/21 01:13*	*03/02/21 12:34*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**8.6**		1.0	1.0	%			02/27/21 12:51	1

Client Sample ID: UDEX-BH-21-01-14-20210225
Lab Sample ID: 410-30633-6

Date Collected: 02/25/21 16:40
Matrix: Solid
Date Received: 02/26/21 19:35
Percent Solids: 88.0

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	410		21	3.9	mg/Kg	☼	02/27/21 15:25	03/02/21 23:43	500

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*125*		*50 - 142*	*02/27/21 15:25*	*03/02/21 23:43*	*500*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		14	5.7	mg/Kg	☼	03/02/21 01:13	03/02/21 12:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*96*		*42 - 143*	*03/02/21 01:13*	*03/02/21 12:58*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	12.0		1.0	1.0	%			02/27/21 12:51	1

Client Sample ID: UDEX-BH-21-01-15-20210225
Lab Sample ID: 410-30633-7

Date Collected: 02/25/21 16:42
Matrix: Solid
Date Received: 02/26/21 19:35
Percent Solids: 90.7

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	24		1.2	0.21	mg/Kg	☼	02/27/21 15:25	03/02/21 03:19	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*101*		*50 - 142*	*02/27/21 15:25*	*03/02/21 03:19*	*25*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		13	5.5	mg/Kg	☼	03/02/21 01:13	03/02/21 13:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*93*		*42 - 143*	*03/02/21 01:13*	*03/02/21 13:23*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	9.3		1.0	1.0	%			02/27/21 12:51	1

Client Sample ID: UDEX-BH-21-01-16-20210225
Lab Sample ID: 410-30633-8

Date Collected: 02/25/21 16:44
Matrix: Solid
Date Received: 02/26/21 19:35
Percent Solids: 84.3

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	50		5.4	0.97	mg/Kg	☼	02/27/21 15:25	03/03/21 07:17	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*124*		*50 - 142*	*02/27/21 15:25*	*03/03/21 07:17*	*100*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		14	5.9	mg/Kg	☼	03/03/21 16:02	03/04/21 11:24	1

Client: Stantec Consulting Corp.
Project/Site: PES UDEX Pilot System Instal

Job ID: 410-30633-1

Client Sample ID: UDEX-BH-21-01-16-20210225
Date Collected: 02/25/21 16:44
Date Received: 02/26/21 19:35

Lab Sample ID: 410-30633-8
Matrix: Solid
Percent Solids: 84.3

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*82*		*42 - 143*	*03/03/21 16:02*	*03/04/21 11:24*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**15.7**		1.0	1.0	%			02/27/21 12:51	1

Surrogate Summary

Client: Stantec Consulting Corp.
Job ID: 410-30633-1
Project/Site: PES UDEX Pilot System Instal

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Matrix: Solid
Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)
		TFT-F1
Lab Sample ID	Client Sample ID	(50-142)
410-30633-1	UDEX-BH-21-01-9-20210225	103
410-30633-2	UDEX-BH-21-01-10-20210225	92
410-30633-3	UDEX-BH-21-01-11-20210225	584 S1+
410-30633-4	UDEX-BH-21-01-12-20210225	127
410-30633-5	UDEX-BH-21-01-13-20210225	845 S1+
410-30633-6	UDEX-BH-21-01-14-20210225	125
410-30633-7	UDEX-BH-21-01-15-20210225	101
410-30633-8	UDEX-BH-21-01-16-20210225	124
LCS 410-98356/6	Lab Control Sample	99
LCS 410-98839/5	Lab Control Sample	96
LCSD 410-98356/7	Lab Control Sample Dup	98
LCSD 410-98839/6	Lab Control Sample Dup	92
MB 410-98356/5	Method Blank	111
MB 410-98839/4	Method Blank	94

Surrogate Legend

TFT-F = a,a,a-Trifluorotoluene (fid)

Method: 8015D - Diesel Range Organics (DRO) (GC)

Matrix: Solid
Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)
		OTP
Lab Sample ID	Client Sample ID	(42-143)
410-30633-1	UDEX-BH-21-01-9-20210225	83
410-30633-2	UDEX-BH-21-01-10-20210225	87
410-30633-3	UDEX-BH-21-01-11-20210225	90
410-30633-4	UDEX-BH-21-01-12-20210225	95
410-30633-5	UDEX-BH-21-01-13-20210225	60
410-30633-6	UDEX-BH-21-01-14-20210225	96
410-30633-7	UDEX-BH-21-01-15-20210225	93
410-30633-8	UDEX-BH-21-01-16-20210225	82
410-30633-8 DU	UDEX-BH-21-01-16-20210225	66
410-30633-8 MS	UDEX-BH-21-01-16-20210225	99
LCS 410-98478/2-A	Lab Control Sample	90
LCS 410-99259/2-A	Lab Control Sample	107
MB 410-98478/1-A	Method Blank	77
MB 410-99259/1-A	Method Blank	108

Surrogate Legend

OTP = o- terphenyl (Surr)

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Lab Sample ID: MB 410-98356/5
Matrix: Solid
Analysis Batch: 98356

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	ND		1.0	0.18	mg/Kg			03/01/21 19:36	25

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*111*		*50 - 142*		*03/01/21 19:36*	*25*

Lab Sample ID: LCS 410-98356/6
Matrix: Solid
Analysis Batch: 98356

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (1C)			11.0	10.7		mg/Kg		97	60 - 132		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*99*		*50 - 142*

Lab Sample ID: LCSD 410-98356/7
Matrix: Solid
Analysis Batch: 98356

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (1C)			11.0	10.7		mg/Kg		97	60 - 132	0	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*98*		*50 - 142*

Lab Sample ID: MB 410-98839/4
Matrix: Solid
Analysis Batch: 98839

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	ND		1.0	0.18	mg/Kg			03/02/21 20:00	25

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*94*		*50 - 142*		*03/02/21 20:00*	*25*

Lab Sample ID: LCS 410-98839/5
Matrix: Solid
Analysis Batch: 98839

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (1C)			11.0	10.3		mg/Kg		93	60 - 132		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*96*		*50 - 142*

Method: 8015D - Gasoline Range Organics (GRO) (GC) (Continued)

Lab Sample ID: LCSD 410-98839/6
Matrix: Solid
Analysis Batch: 98839

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (1C)			11.0	9.86		mg/Kg		90	60 - 132	4	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*92*		*50 - 142*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 410-98478/1-A
Matrix: Solid
Analysis Batch: 98568

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 98478

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		12	5.0	mg/Kg		03/02/21 01:13	03/02/21 10:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*77*		*42 - 143*	*03/02/21 01:13*	*03/02/21 10:57*	*1*

Lab Sample ID: LCS 410-98478/2-A
Matrix: Solid
Analysis Batch: 98568

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 98478

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
DRO (C10-C28)			134	111		mg/Kg		83	76 - 117		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o- terphenyl (Surr)	*90*		*42 - 143*

Lab Sample ID: MB 410-99259/1-A
Matrix: Solid
Analysis Batch: 99457

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 99259

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (C10-C28)	ND		12	5.0	mg/Kg		03/03/21 16:02	03/04/21 10:36	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*108*		*42 - 143*	*03/03/21 16:02*	*03/04/21 10:36*	*1*

Lab Sample ID: LCS 410-99259/2-A
Matrix: Solid
Analysis Batch: 99457

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 99259

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
DRO (C10-C28)			134	138		mg/Kg		103	76 - 117		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o- terphenyl (Surr)	*107*		*42 - 143*

Method: 8015D - Diesel Range Organics (DRO) (GC) (Continued)

Lab Sample ID: 410-30633-8 MS
Matrix: Solid
Analysis Batch: 99457

Client Sample ID: UDEX-BH-21-01-16-20210225
Prep Type: Total/NA
Prep Batch: 99259

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
DRO (C10-C28)	ND		158	154		mg/Kg	☼	97	76 - 117		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
o- terphenyl (Surr)	*99*		*42 - 143*

Lab Sample ID: 410-30633-8 DU
Matrix: Solid
Analysis Batch: 99457

Client Sample ID: UDEX-BH-21-01-16-20210225
Prep Type: Total/NA
Prep Batch: 99259

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
DRO (C10-C28)	ND			ND		mg/Kg	☼			NC	20

Surrogate	*DU %Recovery*	*DU Qualifier*	*Limits*
o- terphenyl (Surr)	*66*		*42 - 143*

GC VOA

Prep Batch: 97993

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30633-1	UDEX-BH-21-01-9-20210225	Total/NA	Solid	5035	
410-30633-2	UDEX-BH-21-01-10-20210225	Total/NA	Solid	5035	
410-30633-3	UDEX-BH-21-01-11-20210225	Total/NA	Solid	5035	
410-30633-4	UDEX-BH-21-01-12-20210225	Total/NA	Solid	5035	
410-30633-5	UDEX-BH-21-01-13-20210225	Total/NA	Solid	5035	
410-30633-6	UDEX-BH-21-01-14-20210225	Total/NA	Solid	5035	
410-30633-7	UDEX-BH-21-01-15-20210225	Total/NA	Solid	5035	
410-30633-8	UDEX-BH-21-01-16-20210225	Total/NA	Solid	5035	

Analysis Batch: 98356

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30633-1	UDEX-BH-21-01-9-20210225	Total/NA	Solid	8015D	97993
410-30633-3	UDEX-BH-21-01-11-20210225	Total/NA	Solid	8015D	97993
410-30633-7	UDEX-BH-21-01-15-20210225	Total/NA	Solid	8015D	97993
MB 410-98356/5	Method Blank	Total/NA	Solid	8015D	
LCS 410-98356/6	Lab Control Sample	Total/NA	Solid	8015D	
LCSD 410-98356/7	Lab Control Sample Dup	Total/NA	Solid	8015D	

Analysis Batch: 98839

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30633-2	UDEX-BH-21-01-10-20210225	Total/NA	Solid	8015D	97993
410-30633-4	UDEX-BH-21-01-12-20210225	Total/NA	Solid	8015D	97993
410-30633-5	UDEX-BH-21-01-13-20210225	Total/NA	Solid	8015D	97993
410-30633-6	UDEX-BH-21-01-14-20210225	Total/NA	Solid	8015D	97993
410-30633-8	UDEX-BH-21-01-16-20210225	Total/NA	Solid	8015D	97993
MB 410-98839/4	Method Blank	Total/NA	Solid	8015D	
LCS 410-98839/5	Lab Control Sample	Total/NA	Solid	8015D	
LCSD 410-98839/6	Lab Control Sample Dup	Total/NA	Solid	8015D	

GC Semi VOA

Prep Batch: 98478

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30633-1	UDEX-BH-21-01-9-20210225	Total/NA	Solid	3546	
410-30633-2	UDEX-BH-21-01-10-20210225	Total/NA	Solid	3546	
410-30633-3	UDEX-BH-21-01-11-20210225	Total/NA	Solid	3546	
410-30633-4	UDEX-BH-21-01-12-20210225	Total/NA	Solid	3546	
410-30633-5	UDEX-BH-21-01-13-20210225	Total/NA	Solid	3546	
410-30633-6	UDEX-BH-21-01-14-20210225	Total/NA	Solid	3546	
410-30633-7	UDEX-BH-21-01-15-20210225	Total/NA	Solid	3546	
MB 410-98478/1-A	Method Blank	Total/NA	Solid	3546	
LCS 410-98478/2-A	Lab Control Sample	Total/NA	Solid	3546	

Analysis Batch: 98568

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30633-1	UDEX-BH-21-01-9-20210225	Total/NA	Solid	8015D	98478
410-30633-2	UDEX-BH-21-01-10-20210225	Total/NA	Solid	8015D	98478
410-30633-3	UDEX-BH-21-01-11-20210225	Total/NA	Solid	8015D	98478
410-30633-4	UDEX-BH-21-01-12-20210225	Total/NA	Solid	8015D	98478
410-30633-5	UDEX-BH-21-01-13-20210225	Total/NA	Solid	8015D	98478
410-30633-6	UDEX-BH-21-01-14-20210225	Total/NA	Solid	8015D	98478

GC Semi VOA (Continued)

Analysis Batch: 98568 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30633-7	UDEX-BH-21-01-15-20210225	Total/NA	Solid	8015D	98478
MB 410-98478/1-A	Method Blank	Total/NA	Solid	8015D	98478
LCS 410-98478/2-A	Lab Control Sample	Total/NA	Solid	8015D	98478

Prep Batch: 99259

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30633-8	UDEX-BH-21-01-16-20210225	Total/NA	Solid	3546	
MB 410-99259/1-A	Method Blank	Total/NA	Solid	3546	
LCS 410-99259/2-A	Lab Control Sample	Total/NA	Solid	3546	
410-30633-8 MS	UDEX-BH-21-01-16-20210225	Total/NA	Solid	3546	
410-30633-8 DU	UDEX-BH-21-01-16-20210225	Total/NA	Solid	3546	

Analysis Batch: 99457

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30633-8	UDEX-BH-21-01-16-20210225	Total/NA	Solid	8015D	99259
MB 410-99259/1-A	Method Blank	Total/NA	Solid	8015D	99259
LCS 410-99259/2-A	Lab Control Sample	Total/NA	Solid	8015D	99259
410-30633-8 MS	UDEX-BH-21-01-16-20210225	Total/NA	Solid	8015D	99259
410-30633-8 DU	UDEX-BH-21-01-16-20210225	Total/NA	Solid	8015D	99259

General Chemistry

Analysis Batch: 97988

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-30633-1	UDEX-BH-21-01-9-20210225	Total/NA	Solid	Moisture	
410-30633-2	UDEX-BH-21-01-10-20210225	Total/NA	Solid	Moisture	
410-30633-3	UDEX-BH-21-01-11-20210225	Total/NA	Solid	Moisture	
410-30633-4	UDEX-BH-21-01-12-20210225	Total/NA	Solid	Moisture	
410-30633-5	UDEX-BH-21-01-13-20210225	Total/NA	Solid	Moisture	
410-30633-6	UDEX-BH-21-01-14-20210225	Total/NA	Solid	Moisture	
410-30633-7	UDEX-BH-21-01-15-20210225	Total/NA	Solid	Moisture	
410-30633-8	UDEX-BH-21-01-16-20210225	Total/NA	Solid	Moisture	

Client Sample ID: UDEX-BH-21-01-9-20210225 — **Lab Sample ID: 410-30633-1**
Date Collected: 02/25/21 16:30 — **Matrix: Solid**
Date Received: 02/26/21 19:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97988	02/27/21 12:51	LY8S	ELLE

Client Sample ID: UDEX-BH-21-01-9-20210225 — **Lab Sample ID: 410-30633-1**
Date Collected: 02/25/21 16:30 — **Matrix: Solid**
Date Received: 02/26/21 19:35 — **Percent Solids: 90.8**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97993	02/27/21 15:25	UK3O	ELLE
Total/NA	Analysis	8015D		25	98356	03/02/21 02:43	JJT8	ELLE
Total/NA	Prep	3546			98478	03/02/21 01:13	USL7	ELLE
Total/NA	Analysis	8015D		1	98568	03/02/21 11:46	IUSB	ELLE

Client Sample ID: UDEX-BH-21-01-10-20210225 — **Lab Sample ID: 410-30633-2**
Date Collected: 02/25/21 16:32 — **Matrix: Solid**
Date Received: 02/26/21 19:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97988	02/27/21 12:51	LY8S	ELLE

Client Sample ID: UDEX-BH-21-01-10-20210225 — **Lab Sample ID: 410-30633-2**
Date Collected: 02/25/21 16:32 — **Matrix: Solid**
Date Received: 02/26/21 19:35 — **Percent Solids: 93.6**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97993	02/27/21 15:25	UK3O	ELLE
Total/NA	Analysis	8015D		500	98839	03/03/21 07:53	UMDJ	ELLE
Total/NA	Prep	3546			98478	03/02/21 01:13	USL7	ELLE
Total/NA	Analysis	8015D		1	98568	03/02/21 14:11	IUSB	ELLE

Client Sample ID: UDEX-BH-21-01-11-20210225 — **Lab Sample ID: 410-30633-3**
Date Collected: 02/25/21 16:34 — **Matrix: Solid**
Date Received: 02/26/21 19:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97988	02/27/21 12:51	LY8S	ELLE

Client Sample ID: UDEX-BH-21-01-11-20210225 — **Lab Sample ID: 410-30633-3**
Date Collected: 02/25/21 16:34 — **Matrix: Solid**
Date Received: 02/26/21 19:35 — **Percent Solids: 92.2**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97993	02/27/21 15:25	UK3O	ELLE
Total/NA	Analysis	8015D		20000	98356	03/02/21 06:56	JJT8	ELLE
Total/NA	Prep	3546			98478	03/02/21 01:13	USL7	ELLE
Total/NA	Analysis	8015D		1	98568	03/02/21 15:23	IUSB	ELLE

Client Sample ID: UDEX-BH-21-01-12-20210225 — **Lab Sample ID: 410-30633-4**
Date Collected: 02/25/21 16:36 — **Matrix: Solid**
Date Received: 02/26/21 19:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97988	02/27/21 12:51	LY8S	ELLE

Client Sample ID: UDEX-BH-21-01-12-20210225 — **Lab Sample ID: 410-30633-4**
Date Collected: 02/25/21 16:36 — **Matrix: Solid**
Date Received: 02/26/21 19:35 — **Percent Solids: 90.5**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97993	02/27/21 15:25	UK3O	ELLE
Total/NA	Analysis	8015D		10000	98839	03/03/21 00:19	UMDJ	ELLE
Total/NA	Prep	3546			98478	03/02/21 01:13	USL7	ELLE
Total/NA	Analysis	8015D		1	98568	03/02/21 12:10	IUSB	ELLE

Client Sample ID: UDEX-BH-21-01-13-20210225 — **Lab Sample ID: 410-30633-5**
Date Collected: 02/25/21 16:38 — **Matrix: Solid**
Date Received: 02/26/21 19:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97988	02/27/21 12:51	LY8S	ELLE

Client Sample ID: UDEX-BH-21-01-13-20210225 — **Lab Sample ID: 410-30633-5**
Date Collected: 02/25/21 16:38 — **Matrix: Solid**
Date Received: 02/26/21 19:35 — **Percent Solids: 91.4**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97993	02/27/21 15:25	UK3O	ELLE
Total/NA	Analysis	8015D		10000	98839	03/03/21 08:29	UMDJ	ELLE
Total/NA	Prep	3546			98478	03/02/21 01:13	USL7	ELLE
Total/NA	Analysis	8015D		1	98568	03/02/21 12:34	IUSB	ELLE

Client Sample ID: UDEX-BH-21-01-14-20210225 — **Lab Sample ID: 410-30633-6**
Date Collected: 02/25/21 16:40 — **Matrix: Solid**
Date Received: 02/26/21 19:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97988	02/27/21 12:51	LY8S	ELLE

Client Sample ID: UDEX-BH-21-01-14-20210225 — **Lab Sample ID: 410-30633-6**
Date Collected: 02/25/21 16:40 — **Matrix: Solid**
Date Received: 02/26/21 19:35 — **Percent Solids: 88.0**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97993	02/27/21 15:25	UK3O	ELLE
Total/NA	Analysis	8015D		500	98839	03/02/21 23:43	UMDJ	ELLE
Total/NA	Prep	3546			98478	03/02/21 01:13	USL7	ELLE
Total/NA	Analysis	8015D		1	98568	03/02/21 12:58	IUSB	ELLE

Lab Chronicle

Client: Stantec Consulting Corp.
Job ID: 410-30633-1
Project/Site: PES UDEX Pilot System Instal

Client Sample ID: UDEX-BH-21-01-15-20210225
Lab Sample ID: 410-30633-7
Date Collected: 02/25/21 16:42
Matrix: Solid
Date Received: 02/26/21 19:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97988	02/27/21 12:51	LY8S	ELLE

Client Sample ID: UDEX-BH-21-01-15-20210225
Lab Sample ID: 410-30633-7
Date Collected: 02/25/21 16:42
Matrix: Solid
Date Received: 02/26/21 19:35
Percent Solids: 90.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97993	02/27/21 15:25	UK3O	ELLE
Total/NA	Analysis	8015D		25	98356	03/02/21 03:19	JJT8	ELLE
Total/NA	Prep	3546			98478	03/02/21 01:13	USL7	ELLE
Total/NA	Analysis	8015D		1	98568	03/02/21 13:23	IUSB	ELLE

Client Sample ID: UDEX-BH-21-01-16-20210225
Lab Sample ID: 410-30633-8
Date Collected: 02/25/21 16:44
Matrix: Solid
Date Received: 02/26/21 19:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	97988	02/27/21 12:51	LY8S	ELLE

Client Sample ID: UDEX-BH-21-01-16-20210225
Lab Sample ID: 410-30633-8
Date Collected: 02/25/21 16:44
Matrix: Solid
Date Received: 02/26/21 19:35
Percent Solids: 84.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			97993	02/27/21 15:25	UK3O	ELLE
Total/NA	Analysis	8015D		100	98839	03/03/21 07:17	UMDJ	ELLE
Total/NA	Prep	3546			99259	03/03/21 16:02	FTV5	ELLE
Total/NA	Analysis	8015D		1	99457	03/04/21 11:24	IUSB	ELLE

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Stantec Consulting Corp. Job ID: 410-30633-1
Project/Site: PES UDEX Pilot System Instal

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Pennsylvania	NELAP	36-00037	01-31-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture

Method Summary

Client: Stantec Consulting Corp.
Job ID: 410-30633-1
Project/Site: PES UDEX Pilot System Instal

Method	Method Description	Protocol	Laboratory
8015D	Gasoline Range Organics (GRO) (GC)	SW846	ELLE
8015D	Diesel Range Organics (DRO) (GC)	SW846	ELLE
Moisture	Percent Moisture	EPA	ELLE
3546	Microwave Extraction	SW846	ELLE
5035	Closed System Purge and Trap	SW846	ELLE

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: Stantec Consulting Corp.
Job ID: 410-30633-1
Project/Site: PES UDEX Pilot System Instal

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
410-30633-1	UDEX-BH-21-01-9-20210225	Solid	02/25/21 16:30	02/26/21 19:35	
410-30633-2	UDEX-BH-21-01-10-20210225	Solid	02/25/21 16:32	02/26/21 19:35	
410-30633-3	UDEX-BH-21-01-11-20210225	Solid	02/25/21 16:34	02/26/21 19:35	
410-30633-4	UDEX-BH-21-01-12-20210225	Solid	02/25/21 16:36	02/26/21 19:35	
410-30633-5	UDEX-BH-21-01-13-20210225	Solid	02/25/21 16:38	02/26/21 19:35	
410-30633-6	UDEX-BH-21-01-14-20210225	Solid	02/25/21 16:40	02/26/21 19:35	
410-30633-7	UDEX-BH-21-01-15-20210225	Solid	02/25/21 16:42	02/26/21 19:35	
410-30633-8	UDEX-BH-21-01-16-20210225	Solid	02/25/21 16:44	02/26/21 19:35	

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # _____ Group # _____ Sample # _____

410-30633 Chain of Custody

581

Client Information

Client: PESRM c/o Stantec	Acct. #: 42093
Project Name/#: Udex Pilot System Instal	PWSID #:
Project Manager: Andrew Klingbeil	P.O. #:
Sampler: Jenny Kachel	Quote #:
State where samples were collected: PA	For Compliance: Yes ☐ No ☐

Matrix

Soil ☒ Sediment ☐ Tissue ☐ | Water ☐ Potable ☐ Ground ☐ NPDES ☐ Surface ☐ | Other: ____

Analysis Requested

Preservation and Filtration Codes

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	TPH-GRO	TPH-DRO
UDEX-BH-21-01-9-20210225	2/25/21	1630	X	X	3	X	X
UDEX-BH-21-01-10-20210225	2/25/21	1632	X		3	X	X
UDEX-BH-21-01-11-20210225	2/25/21	1634	X		3	X	X
UDEX-BH-21-01-12-20210225	2/25/21	1636	X		3	X	X
UDEX-BH-21-01-13-20210225	2/25/21	1638	X		3	X	X
UDEX-BH-21-01-14-20210225	2/25/21	1640	X		3	X	X
UDEX-BH-21-01-15-20210225	2/25/21	1642	X		3	X	X
UDEX-BH-21-01-16-20210225	2/25/21	1644	X		3	X	X

For Lab Use Only
FSC: _____
SCR#: _____

Preservation Codes

H=HCl	T=Thiosulfate
N=HNO_3	B=NaOH
S=H_2SO_4	P=H_3PO_4
F=Field Filtered	O=Other

Remarks

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: _____

E-mail address: jenny.kachel@stantec.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) | Type VI (Raw Data Only)

Type III (Reduced non-CLP) | NJ DKQP | TX TRRP-13

NYSDEC Category A or B | MA MCP | CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	2/26/21	1315	[signature]	2.26.21	815
[signature]	2.26.21	1910	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	[signature]	2-26-21	1935

EDD Required? Yes No

If yes, format: EQuIS

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS _____ FedEx _____ Other X

Temperature upon receipt 1.4 °C

Login Sample Receipt Checklist

Client: Stantec Consulting Corp.

Job Number: 410-30633-1

Login Number: 30633

List Source: Eurofins Lancaster Laboratories Env

List Number: 1

Creator: Jeremiah, Cory T

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	N/A	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified.	N/A	
Residual Chlorine Checked.	N/A	
Sample custody seals are intact.	N/A	

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Tel: (717)656-2300

Laboratory Job ID: 410-67208-1
Client Project/Site: UDEX Confirmation Drilling

For:
Stantec Consulting Corp.
1060 Andrew Drive
Suite 140
West Chester, Pennsylvania 19380

Attn: Andrew Klingbeil

Authorized for release by:
1/3/2022 12:37:08 PM

Amek Carter, Project Manager
(717)556-7252
Loran.Carter@eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

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Amek Carter
Project Manager
1/3/2022 12:37:08 PM

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Qualifiers

GC VOA

Qualifier	Qualifier Description
S1+	Surrogate recovery exceeds control limits, high biased.

GC Semi VOA

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
S1+	Surrogate recovery exceeds control limits, high biased.

General Chemistry

Qualifier	Qualifier Description
!	Laboratory is not accredited for this parameter.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67208-1

Job ID: 410-67208-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Narrative

Job Narrative
410-67208-1

Receipt
The samples were received on 12/16/2021 6:40 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 4.6°C

Gasoline Range Organics
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Diesel Range Organics
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67208-1

Client Sample ID: UDEX-CD-03-17_20211216 — Lab Sample ID: 410-67208-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	73		41	7.5	mg/Kg	1000	☼	8015D	Total/NA
>C12-C22 (1C)	3200		130	53	mg/Kg	10	☼	8015D TPH	Total/NA
>C22-C44 (1C)	180		130	53	mg/Kg	10	☼	8015D TPH	Total/NA

Client Sample ID: UDEX-CD-03-19_20211216 — Lab Sample ID: 410-67208-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	8400		510	92	mg/Kg	10000	☼	8015D	Total/NA
>C12-C22 (1C)	18000		670	280	mg/Kg	50	☼	8015D TPH	Total/NA
>C22-C44 (1C)	880		670	280	mg/Kg	50	☼	8015D TPH	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: UDEX-CD-03-17_20211216
Lab Sample ID: 410-67208-1

Date Collected: 12/16/21 14:10
Matrix: Solid
Date Received: 12/16/21 18:40
Percent Solids: 93.7

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	73		41	7.5	mg/Kg	☼	12/17/21 19:25	12/23/21 20:24	1000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*114*		*50 - 142*	*12/17/21 19:25*	*12/23/21 20:24*	*1000*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	3200		130	53	mg/Kg	☼	12/30/21 08:25	12/30/21 21:53	10
>C22-C44 (1C)	180		130	53	mg/Kg	☼	12/30/21 08:25	12/30/21 21:53	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*85*		*10 - 131*	*12/30/21 08:25*	*12/30/21 21:53*	*10*
o- terphenyl (Surr) (1C)	*332*	*S1+*	*10 - 168*	*12/30/21 08:25*	*12/30/21 21:53*	*10*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	6.3	!	1.0	1.0	%			12/17/21 11:07	1

Client Sample ID: UDEX-CD-03-19_20211216
Lab Sample ID: 410-67208-2

Date Collected: 12/16/21 14:20
Matrix: Solid
Date Received: 12/16/21 18:40
Percent Solids: 88.0

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	8400		510	92	mg/Kg	☼	12/17/21 19:25	12/21/21 01:12	10000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*300*	*S1+*	*50 - 142*	*12/17/21 19:25*	*12/21/21 01:12*	*10000*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	18000		670	280	mg/Kg	☼	12/30/21 08:25	12/30/21 22:15	50
>C22-C44 (1C)	880		670	280	mg/Kg	☼	12/30/21 08:25	12/30/21 22:15	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*700*	*S1+*	*10 - 131*	*12/30/21 08:25*	*12/30/21 22:15*	*50*
o- terphenyl (Surr) (1C)	*1360*	*S1+*	*10 - 168*	*12/30/21 08:25*	*12/30/21 22:15*	*50*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	12.0	!	1.0	1.0	%			12/17/21 11:07	1

Surrogate Summary

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67208-1

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)							
		TFT-F1							
Lab Sample ID	Client Sample ID	(50-142)							
410-67208-1	UDEX-CD-03-17_20211216	114							
410-67208-2	UDEX-CD-03-19_20211216	300 S1+							
LCS 410-207449/5	Lab Control Sample	92							
LCS 410-208887/5	Lab Control Sample	103							
LCSD 410-207449/6	Lab Control Sample Dup	102							
LCSD 410-208887/6	Lab Control Sample Dup	101							
MB 410-207449/4	Method Blank	92							
MB 410-208887/4	Method Blank	100							

Surrogate Legend

TFT-F = a,a,a-Trifluorotoluene (fid)

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)							
		CBNZ1	OTP1						
Lab Sample ID	Client Sample ID	(10-131)	(10-168)						
410-67208-1	UDEX-CD-03-17_20211216	85	332 S1+						
410-67208-2	UDEX-CD-03-19_20211216	700 S1+	1360 S1+						
410-67208-2 DU	UDEX-CD-03-19_20211216	665 S1+	1543 S1+						
410-67208-2 MS	UDEX-CD-03-19_20211216	478 S1+	1187 S1+						
LCS 410-210451/2-A	Lab Control Sample	74	107						
MB 410-210451/1-A	Method Blank	73	95						

Surrogate Legend

CBNZ = Chlorobenzene (Surr)

OTP = o- terphenyl (Surr)

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Lab Sample ID: MB 410-207449/4
Matrix: Solid
Analysis Batch: 207449

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	ND		1.0	0.18	mg/Kg			12/20/21 13:55	25

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*92*		*50 - 142*		*12/20/21 13:55*	*25*

Lab Sample ID: LCS 410-207449/5
Matrix: Solid
Analysis Batch: 207449

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (1C)			11.0	9.30		mg/Kg		85	60 - 132		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*92*		*50 - 142*

Lab Sample ID: LCSD 410-207449/6
Matrix: Solid
Analysis Batch: 207449

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (1C)			11.0	10.4		mg/Kg		95	60 - 132	11	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*102*		*50 - 142*

Lab Sample ID: MB 410-208887/4
Matrix: Solid
Analysis Batch: 208887

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	ND		1.0	0.18	mg/Kg			12/23/21 12:58	25

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*100*		*50 - 142*		*12/23/21 12:58*	*25*

Lab Sample ID: LCS 410-208887/5
Matrix: Solid
Analysis Batch: 208887

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (1C)			11.0	10.7		mg/Kg		98	60 - 132		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*103*		*50 - 142*

Method: 8015D - Gasoline Range Organics (GRO) (GC) (Continued)

Lab Sample ID: LCSD 410-208887/6
Matrix: Solid
Analysis Batch: 208887

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (1C)			11.0	10.6		mg/Kg		96	60 - 132	2	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*101*		*50 - 142*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 410-210451/1-A
Matrix: Solid
Analysis Batch: 210552

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 210451

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	ND		12	5.0	mg/Kg		12/30/21 08:25	12/30/21 13:12	1
>C22-C44 (1C)	ND		12	5.0	mg/Kg		12/30/21 08:25	12/30/21 13:12	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*73*		*10 - 131*	*12/30/21 08:25*	*12/30/21 13:12*	*1*
o- terphenyl (Surr) (1C)	*95*		*10 - 168*	*12/30/21 08:25*	*12/30/21 13:12*	*1*

Lab Sample ID: LCS 410-210451/2-A
Matrix: Solid
Analysis Batch: 210552

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 210451

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
DRO (C10-C28) (1C)			133	116		mg/Kg		87	70 - 115		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Chlorobenzene (Surr) (1C)	*74*		*10 - 131*
o- terphenyl (Surr) (1C)	*107*		*10 - 168*

Lab Sample ID: 410-67208-2 MS
Matrix: Solid
Analysis Batch: 210552

Client Sample ID: UDEX-CD-03-19_20211216
Prep Type: Total/NA
Prep Batch: 210451

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
DRO (C10-C28) (1C)	22000		151	19900	4	mg/Kg	☼	-1375	70 - 115		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Chlorobenzene (Surr) (1C)	*478*	*S1+*	*10 - 131*
o- terphenyl (Surr) (1C)	*1187*	*S1+*	*10 - 168*

Lab Sample ID: 410-67208-2 DU
Matrix: Solid
Analysis Batch: 210552

Client Sample ID: UDEX-CD-03-19_20211216
Prep Type: Total/NA
Prep Batch: 210451

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
>C12-C22 (1C)	18000			20700		mg/Kg	☼			14	20
>C22-C44 (1C)	880			933		mg/Kg	☼			6	20

Method: 8015D TPH - Diesel Range Organics (DRO) (GC) (Continued)

Surrogate	DU %Recovery	DU Qualifier	Limits
Chlorobenzene (Surr) (1C)	665	S1+	10 - 131
o- terphenyl (Surr) (1C)	1543	S1+	10 - 168

QC Association Summary

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67208-1

GC VOA

Prep Batch: 206918

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67208-1	UDEX-CD-03-17_20211216	Total/NA	Solid	5035	
410-67208-2	UDEX-CD-03-19_20211216	Total/NA	Solid	5035	

Analysis Batch: 207449

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67208-2	UDEX-CD-03-19_20211216	Total/NA	Solid	8015D	206918
MB 410-207449/4	Method Blank	Total/NA	Solid	8015D	
LCS 410-207449/5	Lab Control Sample	Total/NA	Solid	8015D	
LCSD 410-207449/6	Lab Control Sample Dup	Total/NA	Solid	8015D	

Analysis Batch: 208887

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67208-1	UDEX-CD-03-17_20211216	Total/NA	Solid	8015D	206918
MB 410-208887/4	Method Blank	Total/NA	Solid	8015D	
LCS 410-208887/5	Lab Control Sample	Total/NA	Solid	8015D	
LCSD 410-208887/6	Lab Control Sample Dup	Total/NA	Solid	8015D	

GC Semi VOA

Prep Batch: 210451

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67208-1	UDEX-CD-03-17_20211216	Total/NA	Solid	3546	
410-67208-2	UDEX-CD-03-19_20211216	Total/NA	Solid	3546	
MB 410-210451/1-A	Method Blank	Total/NA	Solid	3546	
LCS 410-210451/2-A	Lab Control Sample	Total/NA	Solid	3546	
410-67208-2 MS	UDEX-CD-03-19_20211216	Total/NA	Solid	3546	
410-67208-2 DU	UDEX-CD-03-19_20211216	Total/NA	Solid	3546	

Analysis Batch: 210552

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67208-1	UDEX-CD-03-17_20211216	Total/NA	Solid	8015D TPH	210451
410-67208-2	UDEX-CD-03-19_20211216	Total/NA	Solid	8015D TPH	210451
MB 410-210451/1-A	Method Blank	Total/NA	Solid	8015D TPH	210451
LCS 410-210451/2-A	Lab Control Sample	Total/NA	Solid	8015D TPH	210451
410-67208-2 MS	UDEX-CD-03-19_20211216	Total/NA	Solid	8015D TPH	210451
410-67208-2 DU	UDEX-CD-03-19_20211216	Total/NA	Solid	8015D TPH	210451

General Chemistry

Analysis Batch: 206687

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67208-1	UDEX-CD-03-17_20211216	Total/NA	Solid	Moisture	
410-67208-2	UDEX-CD-03-19_20211216	Total/NA	Solid	Moisture	

Lab Chronicle

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67208-1

Client Sample ID: UDEX-CD-03-17_20211216 — **Lab Sample ID: 410-67208-1**
Date Collected: 12/16/21 14:10 — **Matrix: Solid**
Date Received: 12/16/21 18:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	206687	12/17/21 11:07	UVJN	ELLE

Client Sample ID: UDEX-CD-03-17_20211216 — **Lab Sample ID: 410-67208-1**
Date Collected: 12/16/21 14:10 — **Matrix: Solid**
Date Received: 12/16/21 18:40 — **Percent Solids: 93.7**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			206918	12/17/21 19:25	D8NM	ELLE
Total/NA	Analysis	8015D		1000	208887	12/23/21 20:24	JJT8	ELLE
Total/NA	Prep	3546			210451	12/30/21 08:25	U9KU	ELLE
Total/NA	Analysis	8015D TPH		10	210552	12/30/21 21:53	UHEW	ELLE

Client Sample ID: UDEX-CD-03-19_20211216 — **Lab Sample ID: 410-67208-2**
Date Collected: 12/16/21 14:20 — **Matrix: Solid**
Date Received: 12/16/21 18:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	206687	12/17/21 11:07	UVJN	ELLE

Client Sample ID: UDEX-CD-03-19_20211216 — **Lab Sample ID: 410-67208-2**
Date Collected: 12/16/21 14:20 — **Matrix: Solid**
Date Received: 12/16/21 18:40 — **Percent Solids: 88.0**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			206918	12/17/21 19:25	D8NM	ELLE
Total/NA	Analysis	8015D		10000	207449	12/21/21 01:12	JJT8	ELLE
Total/NA	Prep	3546			210451	12/30/21 08:25	U9KU	ELLE
Total/NA	Analysis	8015D TPH		50	210552	12/30/21 22:15	UHEW	ELLE

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Stantec Consulting Corp.
Job ID: 410-67208-1
Project/Site: UDEX Confirmation Drilling

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Pennsylvania	NELAP	36-00037	01-31-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture

Method Summary

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67208-1

Method	Method Description	Protocol	Laboratory
8015D	Gasoline Range Organics (GRO) (GC)	SW846	ELLE
8015D TPH	Diesel Range Organics (DRO) (GC)	SW846	ELLE
Moisture	Percent Moisture	EPA	ELLE
3546	Microwave Extraction	SW846	ELLE
5035	Closed System Purge and Trap	SW846	ELLE

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67208-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-67208-1	UDEX-CD-03-17_20211216	Solid	12/16/21 14:10	12/16/21 18:40
410-67208-2	UDEX-CD-03-19_20211216	Solid	12/16/21 14:20	12/16/21 18:40

Environmental Analysis Custody

eurofins | Lancaster Laboratories Environmental

Acct. # _____

410-67208 Chain of Custody

mental use only

COC #615427

Client Information

Client: PES c/o STANTEC	Acct. #: 42093
Project Name/#: UDEX CONFIRMATION DRILLING	PWSID #:
Project Manager: ANDREW KLINGBEIL	P.O. #: 213403039
Sampler: ANDREA HILL, JENNY KACHEL	Quote #:
State where samples were collected: PA	For Compliance: Yes ☐ No ☑

Matrix

Tissue ☐ Ground ☐ Surface ☐ Sediment ☐ Potable ☐ NPDES ☐ Soil ☒ Water ☐ Other: ☐

Analysis Requested

Preservation and Filtration Codes

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Total # of Containers	TPH-GRO 8015	TPH - DRO PLANES 6015
UDEX-CD-03-17_20211216	12/16/21	1410	X		X	4	X	X
UDEX-CD-03-19_20211216	12/16/21	1420	X		X	4	X	X

For Lab Use Only

FSC: _____

SCR#: _____

Preservation Codes

H=HCl	T=Thiosulfate
N=HNO_3	B=NaOH
S=H_2SO_4	P=H_3PO_4
F=Field Filtered	O=Other

Remarks

Analyze for Full VOC plus Oxygenates, Naphthalene and 1-Methylnaphthalene

AH

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: _____

E-mail address: ANDREW.KLINGBEIL@STANTEC.COM

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) | Type VI (Raw Data Only)

Type III (Reduced non-CLP) | NJ DKQP | TX TRRP-13

NYSDEC Category A or B | MA MCP | CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	12/16/21	1840			
			[signature]	12/16/21	18:40

EDD Required? Yes No

If yes, format: EQUIS EDD

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS _____ FedEx _____ Other _____

Temperature upon receipt 4.6 °C

Eurofins Lancaster Laboratories Environmental, LLC • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • FOR HELP COMPLETING FORM CHECK OUT https://www.eurofinsus.com/coc

The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 0919

Login Sample Receipt Checklist

Client: Stantec Consulting Corp.

Job Number: 410-67208-1

Login Number: 67208

List Source: Eurofins Lancaster Laboratories Env, LLC

List Number: 1

Creator: Jeremiah, Cory T

Question	Answer	Comment
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	N/A	

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ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Tel: (717)656-2300

Laboratory Job ID: 410-67364-1
Client Project/Site: UDEX Confirmation Drilling

For:
Stantec Consulting Corp.
1060 Andrew Drive
Suite 140
West Chester, Pennsylvania 19380

Attn: Andrew Klingbeil

Authorized for release by:
1/4/2022 4:57:30 AM

Amek Carter, Project Manager
(717)556-7252
Loran.Carter@eurofinset.com

LINKS

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Visit us at: www.eurofinsus.com/Env

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

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Amek Carter
Project Manager
1/4/2022 4:57:30 AM

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Qualifiers

GC VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
!	Laboratory is not accredited for this parameter.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67364-1

Job ID: 410-67364-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Narrative

Job Narrative
410-67364-1

Receipt
The samples were received on 12/17/2021 3:16 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 5.9°C

Gasoline Range Organics
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Diesel Range Organics
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67364-1

Client Sample ID: UDEX-01HPT-01-17_20211217 — Lab Sample ID: 410-67364-1

No Detections.

Client Sample ID: UDEX-01HPT-01-18_20211217 — Lab Sample ID: 410-67364-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	0.78	J	1.2	0.22	mg/Kg	25	☼	8015D	Total/NA

Client Sample ID: UDEX-01HPT-01-19_20211217 — Lab Sample ID: 410-67364-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	1.8		1.2	0.21	mg/Kg	25	☼	8015D	Total/NA

Client Sample ID: UDEX-01HPT-01-20_20211217 — Lab Sample ID: 410-67364-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	600		50	9.0	mg/Kg	1000	☼	8015D	Total/NA
>C12-C22 (1C)	34		13	5.3	mg/Kg	1	☼	8015D TPH	Total/NA
>C22-C44 (1C)	34		13	5.3	mg/Kg	1	☼	8015D TPH	Total/NA

Client Sample ID: UDEX-01HPT-01-21_0211217 — Lab Sample ID: 410-67364-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	54		12	2.2	mg/Kg	250	☼	8015D	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: UDEX-01HPT-01-17_20211217 — Lab Sample ID: 410-67364-1

Date Collected: 12/17/21 09:10 — **Matrix: Solid**
Date Received: 12/17/21 15:16 — **Percent Solids: 94.0**

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	ND		1.3	0.24	mg/Kg	☼	12/18/21 16:40	12/20/21 20:09	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*92*		*50 - 142*	*12/18/21 16:40*	*12/20/21 20:09*	*25*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	ND		13	5.3	mg/Kg	☼	12/31/21 09:35	01/03/22 16:15	1
>C22-C44 (1C)	ND		13	5.3	mg/Kg	☼	12/31/21 09:35	01/03/22 16:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*79*		*10 - 131*	*12/31/21 09:35*	*01/03/22 16:15*	*1*
o- terphenyl (Surr) (1C)	*96*		*10 - 168*	*12/31/21 09:35*	*01/03/22 16:15*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**6.0**	**!**	1.0	1.0	%			12/20/21 08:32	1

Client Sample ID: UDEX-01HPT-01-18_20211217 — Lab Sample ID: 410-67364-2

Date Collected: 12/17/21 09:20 — **Matrix: Solid**
Date Received: 12/17/21 15:16 — **Percent Solids: 88.2**

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	**0.78**	**J**	1.2	0.22	mg/Kg	☼	12/18/21 16:40	12/20/21 20:45	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*104*		*50 - 142*	*12/18/21 16:40*	*12/20/21 20:45*	*25*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	ND		13	5.6	mg/Kg	☼	12/31/21 09:35	01/03/22 14:07	1
>C22-C44 (1C)	ND		13	5.6	mg/Kg	☼	12/31/21 09:35	01/03/22 14:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*28*		*10 - 131*	*12/31/21 09:35*	*01/03/22 14:07*	*1*
o- terphenyl (Surr) (1C)	*68*		*10 - 168*	*12/31/21 09:35*	*01/03/22 14:07*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**11.8**	**!**	1.0	1.0	%			12/20/21 08:32	1

Client Sample ID: UDEX-01HPT-01-19_20211217 — Lab Sample ID: 410-67364-3

Date Collected: 12/17/21 09:30 — **Matrix: Solid**
Date Received: 12/17/21 15:16 — **Percent Solids: 91.6**

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	**1.8**		1.2	0.21	mg/Kg	☼	12/18/21 16:40	12/20/21 22:40	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*92*		*50 - 142*	*12/18/21 16:40*	*12/20/21 22:40*	*25*

Client Sample ID: UDEX-01HPT-01-19_20211217
Lab Sample ID: 410-67364-3

Date Collected: 12/17/21 09:30
Matrix: Solid
Date Received: 12/17/21 15:16
Percent Solids: 91.6

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	ND		13	5.4	mg/Kg	☼	12/31/21 09:35	01/03/22 15:11	1
>C22-C44 (1C)	ND		13	5.4	mg/Kg	☼	12/31/21 09:35	01/03/22 15:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*19*		*10 - 131*	*12/31/21 09:35*	*01/03/22 15:11*	*1*
o- terphenyl (Surr) (1C)	*59*		*10 - 168*	*12/31/21 09:35*	*01/03/22 15:11*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**8.4**	**!**	1.0	1.0	%			12/20/21 08:32	1

Client Sample ID: UDEX-01HPT-01-20_20211217
Lab Sample ID: 410-67364-4

Date Collected: 12/17/21 09:40
Matrix: Solid
Date Received: 12/17/21 15:16
Percent Solids: 93.7

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	**600**		50	9.0	mg/Kg	☼	12/18/21 16:40	12/20/21 23:17	1000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*125*		*50 - 142*	*12/18/21 16:40*	*12/20/21 23:17*	*1000*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	**34**		13	5.3	mg/Kg	☼	12/31/21 09:35	01/03/22 15:53	1
>C22-C44 (1C)	**34**		13	5.3	mg/Kg	☼	12/31/21 09:35	01/03/22 15:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*76*		*10 - 131*	*12/31/21 09:35*	*01/03/22 15:53*	*1*
o- terphenyl (Surr) (1C)	*112*		*10 - 168*	*12/31/21 09:35*	*01/03/22 15:53*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**6.3**	**!**	1.0	1.0	%			12/20/21 08:32	1

Client Sample ID: UDEX-01HPT-01-21_0211217
Lab Sample ID: 410-67364-5

Date Collected: 12/17/21 09:50
Matrix: Solid
Date Received: 12/17/21 15:16
Percent Solids: 90.5

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	**54**		12	2.2	mg/Kg	☼	12/18/21 16:40	12/20/21 23:53	250

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*105*		*50 - 142*	*12/18/21 16:40*	*12/20/21 23:53*	*250*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	ND		13	5.5	mg/Kg	☼	12/31/21 09:35	01/03/22 15:32	1
>C22-C44 (1C)	ND		13	5.5	mg/Kg	☼	12/31/21 09:35	01/03/22 15:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*72*		*10 - 131*	*12/31/21 09:35*	*01/03/22 15:32*	*1*

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67364-1

Client Sample ID: UDEX-01HPT-01-21_0211217
Date Collected: 12/17/21 09:50
Date Received: 12/17/21 15:16

Lab Sample ID: 410-67364-5
Matrix: Solid
Percent Solids: 90.5

Method: 8015D TPH - Diesel Range Organics (DRO) (GC) (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr) (1C)	*95*		*10 - 168*	*12/31/21 09:35*	*01/03/22 15:32*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	9.5	!	1.0	1.0	%			12/20/21 08:32	1

Surrogate Summary

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67364-1

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)
		TFT-F1
Lab Sample ID	Client Sample ID	(50-142)
410-67364-1	UDEX-01HPT-01-17_20211217	92
410-67364-2	UDEX-01HPT-01-18_20211217	104
410-67364-3	UDEX-01HPT-01-19_20211217	92
410-67364-4	UDEX-01HPT-01-20_20211217	125
410-67364-5	UDEX-01HPT-01-21_0211217	105
LCS 410-207449/5	Lab Control Sample	92
LCSD 410-207449/6	Lab Control Sample Dup	102
MB 410-207449/4	Method Blank	92

Surrogate Legend

TFT-F = a,a,a-Trifluorotoluene (fid)

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
		CBNZ1	OTP1
Lab Sample ID	Client Sample ID	(10-131)	(10-168)
410-67364-1	UDEX-01HPT-01-17_20211217	79	96
410-67364-2	UDEX-01HPT-01-18_20211217	28	68
410-67364-2 DU	UDEX-01HPT-01-18_20211217	79	100
410-67364-2 MS	UDEX-01HPT-01-18_20211217	79	108
410-67364-3	UDEX-01HPT-01-19_20211217	19	59
410-67364-4	UDEX-01HPT-01-20_20211217	76	112
410-67364-5	UDEX-01HPT-01-21_0211217	72	95
LCS 410-210837/2-A	Lab Control Sample	80	112
MB 410-210837/1-A	Method Blank	81	103

Surrogate Legend

CBNZ = Chlorobenzene (Surr)

OTP = o- terphenyl (Surr)

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Lab Sample ID: MB 410-207449/4
Matrix: Solid
Analysis Batch: 207449

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	ND		1.0	0.18	mg/Kg			12/20/21 13:55	25

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*92*		*50 - 142*		*12/20/21 13:55*	*25*

Lab Sample ID: LCS 410-207449/5
Matrix: Solid
Analysis Batch: 207449

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (1C)			11.0	9.30		mg/Kg		85	60 - 132		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*92*		*50 - 142*

Lab Sample ID: LCSD 410-207449/6
Matrix: Solid
Analysis Batch: 207449

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (1C)			11.0	10.4		mg/Kg		95	60 - 132	11	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*102*		*50 - 142*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 410-210837/1-A
Matrix: Solid
Analysis Batch: 211028

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 210837

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	ND		12	5.0	mg/Kg		12/31/21 09:35	01/03/22 10:45	1
>C22-C44 (1C)	ND		12	5.0	mg/Kg		12/31/21 09:35	01/03/22 10:45	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*81*		*10 - 131*	*12/31/21 09:35*	*01/03/22 10:45*	*1*
o- terphenyl (Surr) (1C)	*103*		*10 - 168*	*12/31/21 09:35*	*01/03/22 10:45*	*1*

Lab Sample ID: LCS 410-210837/2-A
Matrix: Solid
Analysis Batch: 211028

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 210837

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
DRO (C10-C28) (1C)			133	123		mg/Kg		92	70 - 115		

Method: 8015D TPH - Diesel Range Organics (DRO) (GC) (Continued)

Lab Sample ID: LCS 410-210837/2-A
Matrix: Solid
Analysis Batch: 211028

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 210837

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Chlorobenzene (Surr) (1C)	*80*		*10 - 131*
o- terphenyl (Surr) (1C)	*112*		*10 - 168*

Lab Sample ID: 410-67364-2 MS
Matrix: Solid
Analysis Batch: 211028

Client Sample ID: UDEX-01HPT-01-18_20211217
Prep Type: Total/NA
Prep Batch: 210837

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
DRO (C10-C28) (1C)	ND		149	128		mg/Kg	☼	86	70 - 115

Surrogate	MS %Recovery	MS Qualifier	Limits
Chlorobenzene (Surr) (1C)	*79*		*10 - 131*
o- terphenyl (Surr) (1C)	*108*		*10 - 168*

Lab Sample ID: 410-67364-2 DU
Matrix: Solid
Analysis Batch: 211028

Client Sample ID: UDEX-01HPT-01-18_20211217
Prep Type: Total/NA
Prep Batch: 210837

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
>C12-C22 (1C)	ND		ND		mg/Kg	☼	NC	20
>C22-C44 (1C)	ND		ND		mg/Kg	☼	NC	20

Surrogate	DU %Recovery	DU Qualifier	Limits
Chlorobenzene (Surr) (1C)	*79*		*10 - 131*
o- terphenyl (Surr) (1C)	*100*		*10 - 168*

QC Association Summary

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67364-1

GC VOA

Prep Batch: 207095

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67364-1	UDEX-01HPT-01-17_20211217	Total/NA	Solid	5035	
410-67364-2	UDEX-01HPT-01-18_20211217	Total/NA	Solid	5035	
410-67364-3	UDEX-01HPT-01-19_20211217	Total/NA	Solid	5035	
410-67364-4	UDEX-01HPT-01-20_20211217	Total/NA	Solid	5035	
410-67364-5	UDEX-01HPT-01-21_0211217	Total/NA	Solid	5035	

Analysis Batch: 207449

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67364-1	UDEX-01HPT-01-17_20211217	Total/NA	Solid	8015D	207095
410-67364-2	UDEX-01HPT-01-18_20211217	Total/NA	Solid	8015D	207095
410-67364-3	UDEX-01HPT-01-19_20211217	Total/NA	Solid	8015D	207095
410-67364-4	UDEX-01HPT-01-20_20211217	Total/NA	Solid	8015D	207095
410-67364-5	UDEX-01HPT-01-21_0211217	Total/NA	Solid	8015D	207095
MB 410-207449/4	Method Blank	Total/NA	Solid	8015D	
LCS 410-207449/5	Lab Control Sample	Total/NA	Solid	8015D	
LCSD 410-207449/6	Lab Control Sample Dup	Total/NA	Solid	8015D	

GC Semi VOA

Prep Batch: 210837

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67364-1	UDEX-01HPT-01-17_20211217	Total/NA	Solid	3546	
410-67364-2	UDEX-01HPT-01-18_20211217	Total/NA	Solid	3546	
410-67364-3	UDEX-01HPT-01-19_20211217	Total/NA	Solid	3546	
410-67364-4	UDEX-01HPT-01-20_20211217	Total/NA	Solid	3546	
410-67364-5	UDEX-01HPT-01-21_0211217	Total/NA	Solid	3546	
MB 410-210837/1-A	Method Blank	Total/NA	Solid	3546	
LCS 410-210837/2-A	Lab Control Sample	Total/NA	Solid	3546	
410-67364-2 MS	UDEX-01HPT-01-18_20211217	Total/NA	Solid	3546	
410-67364-2 DU	UDEX-01HPT-01-18_20211217	Total/NA	Solid	3546	

Analysis Batch: 211028

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67364-1	UDEX-01HPT-01-17_20211217	Total/NA	Solid	8015D TPH	210837
410-67364-2	UDEX-01HPT-01-18_20211217	Total/NA	Solid	8015D TPH	210837
410-67364-3	UDEX-01HPT-01-19_20211217	Total/NA	Solid	8015D TPH	210837
410-67364-4	UDEX-01HPT-01-20_20211217	Total/NA	Solid	8015D TPH	210837
410-67364-5	UDEX-01HPT-01-21_0211217	Total/NA	Solid	8015D TPH	210837
MB 410-210837/1-A	Method Blank	Total/NA	Solid	8015D TPH	210837
LCS 410-210837/2-A	Lab Control Sample	Total/NA	Solid	8015D TPH	210837
410-67364-2 MS	UDEX-01HPT-01-18_20211217	Total/NA	Solid	8015D TPH	210837
410-67364-2 DU	UDEX-01HPT-01-18_20211217	Total/NA	Solid	8015D TPH	210837

General Chemistry

Analysis Batch: 207341

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67364-1	UDEX-01HPT-01-17_20211217	Total/NA	Solid	Moisture	
410-67364-2	UDEX-01HPT-01-18_20211217	Total/NA	Solid	Moisture	
410-67364-3	UDEX-01HPT-01-19_20211217	Total/NA	Solid	Moisture	
410-67364-4	UDEX-01HPT-01-20_20211217	Total/NA	Solid	Moisture	
410-67364-5	UDEX-01HPT-01-21_0211217	Total/NA	Solid	Moisture	

Lab Chronicle

Client: Stantec Consulting Corp.
Job ID: 410-67364-1
Project/Site: UDEX Confirmation Drilling

Client Sample ID: UDEX-01HPT-01-17_20211217
Lab Sample ID: 410-67364-1
Date Collected: 12/17/21 09:10
Matrix: Solid
Date Received: 12/17/21 15:16

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	207341	12/20/21 08:32	UWC1	ELLE

Client Sample ID: UDEX-01HPT-01-17_20211217
Lab Sample ID: 410-67364-1
Date Collected: 12/17/21 09:10
Matrix: Solid
Date Received: 12/17/21 15:16
Percent Solids: 94.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			207095	12/18/21 16:40	UK3O	ELLE
Total/NA	Analysis	8015D		25	207449	12/20/21 20:09	JJT8	ELLE
Total/NA	Prep	3546			210837	12/31/21 09:35	A2VL	ELLE
Total/NA	Analysis	8015D TPH		1	211028	01/03/22 16:15	KP5X	ELLE

Client Sample ID: UDEX-01HPT-01-18_20211217
Lab Sample ID: 410-67364-2
Date Collected: 12/17/21 09:20
Matrix: Solid
Date Received: 12/17/21 15:16

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	207341	12/20/21 08:32	UWC1	ELLE

Client Sample ID: UDEX-01HPT-01-18_20211217
Lab Sample ID: 410-67364-2
Date Collected: 12/17/21 09:20
Matrix: Solid
Date Received: 12/17/21 15:16
Percent Solids: 88.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			207095	12/18/21 16:40	UK3O	ELLE
Total/NA	Analysis	8015D		25	207449	12/20/21 20:45	JJT8	ELLE
Total/NA	Prep	3546			210837	12/31/21 09:35	A2VL	ELLE
Total/NA	Analysis	8015D TPH		1	211028	01/03/22 14:07	KP5X	ELLE

Client Sample ID: UDEX-01HPT-01-19_20211217
Lab Sample ID: 410-67364-3
Date Collected: 12/17/21 09:30
Matrix: Solid
Date Received: 12/17/21 15:16

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	207341	12/20/21 08:32	UWC1	ELLE

Client Sample ID: UDEX-01HPT-01-19_20211217
Lab Sample ID: 410-67364-3
Date Collected: 12/17/21 09:30
Matrix: Solid
Date Received: 12/17/21 15:16
Percent Solids: 91.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			207095	12/18/21 16:40	UK3O	ELLE
Total/NA	Analysis	8015D		25	207449	12/20/21 22:40	JJT8	ELLE
Total/NA	Prep	3546			210837	12/31/21 09:35	A2VL	ELLE
Total/NA	Analysis	8015D TPH		1	211028	01/03/22 15:11	KP5X	ELLE

Lab Chronicle

Client: Stantec Consulting Corp.
Job ID: 410-67364-1
Project/Site: UDEX Confirmation Drilling

Client Sample ID: UDEX-01HPT-01-20_20211217
Lab Sample ID: 410-67364-4
Date Collected: 12/17/21 09:40
Matrix: Solid
Date Received: 12/17/21 15:16

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	207341	12/20/21 08:32	UWC1	ELLE

Client Sample ID: UDEX-01HPT-01-20_20211217
Lab Sample ID: 410-67364-4
Date Collected: 12/17/21 09:40
Matrix: Solid
Date Received: 12/17/21 15:16
Percent Solids: 93.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			207095	12/18/21 16:40	UK3O	ELLE
Total/NA	Analysis	8015D		1000	207449	12/20/21 23:17	JJT8	ELLE
Total/NA	Prep	3546			210837	12/31/21 09:35	A2VL	ELLE
Total/NA	Analysis	8015D TPH		1	211028	01/03/22 15:53	KP5X	ELLE

Client Sample ID: UDEX-01HPT-01-21_0211217
Lab Sample ID: 410-67364-5
Date Collected: 12/17/21 09:50
Matrix: Solid
Date Received: 12/17/21 15:16

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	207341	12/20/21 08:32	UWC1	ELLE

Client Sample ID: UDEX-01HPT-01-21_0211217
Lab Sample ID: 410-67364-5
Date Collected: 12/17/21 09:50
Matrix: Solid
Date Received: 12/17/21 15:16
Percent Solids: 90.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			207095	12/18/21 16:40	UK3O	ELLE
Total/NA	Analysis	8015D		250	207449	12/20/21 23:53	JJT8	ELLE
Total/NA	Prep	3546			210837	12/31/21 09:35	A2VL	ELLE
Total/NA	Analysis	8015D TPH		1	211028	01/03/22 15:32	KP5X	ELLE

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Stantec Consulting Corp.
Job ID: 410-67364-1
Project/Site: UDEX Confirmation Drilling

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Pennsylvania	NELAP	36-00037	01-31-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture

Method Summary

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67364-1

Method	Method Description	Protocol	Laboratory
8015D	Gasoline Range Organics (GRO) (GC)	SW846	ELLE
8015D TPH	Diesel Range Organics (DRO) (GC)	SW846	ELLE
Moisture	Percent Moisture	EPA	ELLE
3546	Microwave Extraction	SW846	ELLE
5035	Closed System Purge and Trap	SW846	ELLE

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67364-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-67364-1	UDEX-01HPT-01-17_20211217	Solid	12/17/21 09:10	12/17/21 15:16
410-67364-2	UDEX-01HPT-01-18_20211217	Solid	12/17/21 09:20	12/17/21 15:16
410-67364-3	UDEX-01HPT-01-19_20211217	Solid	12/17/21 09:30	12/17/21 15:16
410-67364-4	UDEX-01HPT-01-20_20211217	Solid	12/17/21 09:40	12/17/21 15:16
410-67364-5	UDEX-01HPT-01-21_0211217	Solid	12/17/21 09:50	12/17/21 15:16

Environmental Analysis R ustody

eurofins | Lancaster Laboratories Environmental

Acct. # _____

410-67364 Chain of Custody

ental use only

COC # 615428

Client Information		Matrix						Analysis Requested												For Lab Use Only
Client: PES % STANTEC	Acct. #: 42093	Tissue ☐	Ground ☐	Surface ☐				Preservation and Filtration Codes												FSC:
Project Name/#: UDEX CONFIRMATION DRILLING	PWSID #:	Soil ☒	Potable ☐	NPDES ☐																SCR#:
Project Manager: ANDREW KLINGBEIL	P.O. #: 213403039	Sediment ☐	Water ☐	Other:																
Sampler: ANDREA HILL	Quote #:																			

State where samples were collected:	For Compliance:
PA	Yes ☐ No ☐

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	TPH-GRO 8015	TPH Custom Ranges 8015
UDEX-01HPT-01-17_20211217	12/17/21	0910	X		4	X	X
UDEX-01HPT-01-18_20211217	12/17/21	0920	X		4	X	X
UDEX-01HPT-01-19_20211217	12/17/21	0930	X		4	X	X
UDEX-01HPT-01-20_20211217	12/17/21	0940	X		4	X	X
UDEX-01HPT-01-21_20211217	12/17/21	0950	X		4	X	X

Preservation Codes

H=HCl	T=Thiosulfate
N=HNO_3	B=NaOH
S=H_2SO_4	P=H_3PO_4
F=Field Filtered	O=Other

Remarks

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: _____

E-mail address: ANDREW.KLINGBEIL@STANTEC.COM

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP)	Type VI (Raw Data Only)	
Type III (Reduced non-CLP)	NJ DKQP	TX TRRP-13
NYSDEC Category A or B	MA MCP	CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	12/17/21	15:16			
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time
			[signature]	12/17/21	~~15:13~~ 1057

EDD Required? Yes No

If yes, format: EQUIS EDD

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: 15:16

UPS _____ FedEx _____ Other _____

Temperature upon receipt 5.9 °C

12/17/21 (2)

Eurofins Lancaster Laboratories Environmental, LLC • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • FOR HELP COMPLETING FORM CHECK OUT https://www.eurofinsus.com/coc

The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 0919

(7)

Login Sample Receipt Checklist

Client: Stantec Consulting Corp.

Job Number: 410-67364-1

Login Number: 67364

List Source: Eurofins Lancaster Laboratories Env, LLC

List Number: 1

Creator: Jeremiah, Cory T

Question	Answer	Comment
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	N/A	

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Tel: (717)656-2300

Laboratory Job ID: 410-67745-1
Client Project/Site: UDEX Confirmation Drilling

For:
Stantec Consulting Corp.
1060 Andrew Drive
Suite 140
West Chester, Pennsylvania 19380

Attn: Andrew Klingbeil

Authorized for release by:
1/6/2022 4:22:33 PM

Amek Carter, Project Manager
(717)556-7252
Loran.Carter@eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

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Amek Carter
Project Manager
1/6/2022 4:22:33 PM

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Qualifiers

GC VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
S1+	Surrogate recovery exceeds control limits, high biased.

GC Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
S1-	Surrogate recovery exceeds control limits, low biased.

General Chemistry

Qualifier	Qualifier Description
!	Laboratory is not accredited for this parameter.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67745-1

Job ID: 410-67745-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Narrative

Job Narrative
410-67745-1

Receipt
The samples were received on 12/21/2021 3:47 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 0.4°C

Gasoline Range Organics
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Diesel Range Organics
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67745-1

Client Sample ID: UDEX-01HPT-02-12_20211220 — Lab Sample ID: 410-67745-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	0.76	J	1.2	0.22	mg/Kg	25	☼	8015D	Total/NA
>C12-C22 (1C)	45		12	5.2	mg/Kg	1	☼	8015D TPH	Total/NA
>C22-C44 (1C)	6.2	J	12	5.2	mg/Kg	1	☼	8015D TPH	Total/NA

Client Sample ID: UDEX-01HPT-02-13_20211220 — Lab Sample ID: 410-67745-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	0.42	J	1.3	0.24	mg/Kg	25	☼	8015D	Total/NA

Client Sample ID: UDEX-CD-08D-16_20211220 — Lab Sample ID: 410-67745-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	1.5		1.2	0.21	mg/Kg	25	☼	8015D	Total/NA
>C12-C22 (1C)	19		13	5.3	mg/Kg	1	☼	8015D TPH	Total/NA
>C22-C44 (1C)	12	J	13	5.3	mg/Kg	1	☼	8015D TPH	Total/NA

Client Sample ID: UDEX-CD-08D-17_20211220 — Lab Sample ID: 410-67745-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	400		44	8.0	mg/Kg	1000	☼	8015D	Total/NA
>C12-C22 (1C)	6.5	J	14	5.7	mg/Kg	1	☼	8015D TPH	Total/NA
>C22-C44 (1C)	5.9	J	14	5.7	mg/Kg	1	☼	8015D TPH	Total/NA

Client Sample ID: UDEX-CD-08D-18_20211220 — Lab Sample ID: 410-67745-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	3600		250	46	mg/Kg	5000	☼	8015D	Total/NA

Client Sample ID: UDEX-CD-08D-19_20211220 — Lab Sample ID: 410-67745-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	6900		1100	190	mg/Kg	20000	☼	8015D	Total/NA

Client Sample ID: UDEX-CD-01-14-20211221 — Lab Sample ID: 410-67745-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	1.1	J	1.4	0.25	mg/Kg	25	☼	8015D	Total/NA
>C12-C22 (1C)	34		13	5.6	mg/Kg	1	☼	8015D TPH	Total/NA

Client Sample ID: UDEX-CD-01-15-20211221 — Lab Sample ID: 410-67745-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	3400		490	88	mg/Kg	10000	☼	8015D	Total/NA
>C22-C44 (1C)	7.8	J	13	5.6	mg/Kg	1	☼	8015D TPH	Total/NA

Client Sample ID: UDEX-CD-01-16-20211221 — Lab Sample ID: 410-67745-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	2000		430	78	mg/Kg	10000	☼	8015D	Total/NA
>C12-C22 (1C)	180		13	5.6	mg/Kg	1	☼	8015D TPH	Total/NA
>C22-C44 (1C)	110		13	5.6	mg/Kg	1	☼	8015D TPH	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Lancaster Laboratories Env, LLC

Detection Summary

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67745-1

Client Sample ID: UDEX-CD-01-17-20211221 — Lab Sample ID: 410-67745-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	43		5.1	0.92	mg/Kg	100	☼	8015D	Total/NA

Client Sample ID: UDEX-CD-01-18-20211221 — Lab Sample ID: 410-67745-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	0.66	J	1.4	0.24	mg/Kg	25	☼	8015D	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: UDEX-01HPT-02-12_20211220
Lab Sample ID: 410-67745-1

Date Collected: 12/20/21 12:40
Matrix: Solid
Date Received: 12/21/21 15:47
Percent Solids: 96.2

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	0.76	J	1.2	0.22	mg/Kg	☼	12/22/21 10:13	12/28/21 16:37	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*107*		*50 - 142*	*12/22/21 10:13*	*12/28/21 16:37*	*25*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	45		12	5.2	mg/Kg	☼	01/03/22 17:17	01/04/22 14:13	1
>C22-C44 (1C)	6.2	J	12	5.2	mg/Kg	☼	01/03/22 17:17	01/04/22 14:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*74*		*10 - 131*	*01/03/22 17:17*	*01/04/22 14:13*	*1*
o- terphenyl (Surr) (1C)	*113*		*10 - 168*	*01/03/22 17:17*	*01/04/22 14:13*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	3.8	!	1.0	1.0	%			12/22/21 10:08	1

Client Sample ID: UDEX-01HPT-02-13_20211220
Lab Sample ID: 410-67745-2

Date Collected: 12/20/21 12:50
Matrix: Solid
Date Received: 12/21/21 15:47
Percent Solids: 91.6

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	0.42	J	1.3	0.24	mg/Kg	☼	12/22/21 10:13	12/28/21 17:15	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*105*		*50 - 142*	*12/22/21 10:13*	*12/28/21 17:15*	*25*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	ND		13	5.4	mg/Kg	☼	01/03/22 17:17	01/04/22 14:35	1
>C22-C44 (1C)	ND		13	5.4	mg/Kg	☼	01/03/22 17:17	01/04/22 14:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*75*		*10 - 131*	*01/03/22 17:17*	*01/04/22 14:35*	*1*
o- terphenyl (Surr) (1C)	*98*		*10 - 168*	*01/03/22 17:17*	*01/04/22 14:35*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	8.4	!	1.0	1.0	%			12/22/21 10:08	1

Client Sample ID: UDEX-CD-08D-16_20211220
Lab Sample ID: 410-67745-3

Date Collected: 12/20/21 15:40
Matrix: Solid
Date Received: 12/21/21 15:47
Percent Solids: 94.7

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	1.5		1.2	0.21	mg/Kg	☼	12/22/21 10:13	12/28/21 17:54	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*107*		*50 - 142*	*12/22/21 10:13*	*12/28/21 17:54*	*25*

Client Sample ID: UDEX-CD-08D-16_20211220
Lab Sample ID: 410-67745-3

Date Collected: 12/20/21 15:40
Matrix: Solid
Date Received: 12/21/21 15:47
Percent Solids: 94.7

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	19		13	5.3	mg/Kg	☼	01/03/22 17:17	01/04/22 14:56	1
>C22-C44 (1C)	12	J	13	5.3	mg/Kg	☼	01/03/22 17:17	01/04/22 14:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*75*		*10 - 131*	*01/03/22 17:17*	*01/04/22 14:56*	*1*
o- terphenyl (Surr) (1C)	*107*		*10 - 168*	*01/03/22 17:17*	*01/04/22 14:56*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	5.3	!	1.0	1.0	%			12/22/21 10:08	1

Client Sample ID: UDEX-CD-08D-17_20211220
Lab Sample ID: 410-67745-4

Date Collected: 12/20/21 15:50
Matrix: Solid
Date Received: 12/21/21 15:47
Percent Solids: 86.9

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	400		44	8.0	mg/Kg	☼	12/22/21 10:13	12/30/21 19:01	1000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*119*		*50 - 142*	*12/22/21 10:13*	*12/30/21 19:01*	*1000*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	6.5	J	14	5.7	mg/Kg	☼	01/03/22 17:17	01/04/22 15:17	1
>C22-C44 (1C)	5.9	J	14	5.7	mg/Kg	☼	01/03/22 17:17	01/04/22 15:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*71*		*10 - 131*	*01/03/22 17:17*	*01/04/22 15:17*	*1*
o- terphenyl (Surr) (1C)	*93*		*10 - 168*	*01/03/22 17:17*	*01/04/22 15:17*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	13.1	!	1.0	1.0	%			12/22/21 10:08	1

Client Sample ID: UDEX-CD-08D-18_20211220
Lab Sample ID: 410-67745-5

Date Collected: 12/20/21 16:00
Matrix: Solid
Date Received: 12/21/21 15:47
Percent Solids: 89.4

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	3600		250	46	mg/Kg	☼	12/22/21 10:31	12/30/21 17:41	5000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*320*	*S1+*	*50 - 142*	*12/22/21 10:31*	*12/30/21 17:41*	*5000*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	ND		13	5.6	mg/Kg	☼	01/03/22 17:17	01/04/22 15:39	1
>C22-C44 (1C)	ND		13	5.6	mg/Kg	☼	01/03/22 17:17	01/04/22 15:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*73*		*10 - 131*	*01/03/22 17:17*	*01/04/22 15:39*	*1*

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67745-1

Client Sample ID: UDEX-CD-08D-18_20211220

Lab Sample ID: 410-67745-5

Date Collected: 12/20/21 16:00
Matrix: Solid
Date Received: 12/21/21 15:47
Percent Solids: 89.4

Method: 8015D TPH - Diesel Range Organics (DRO) (GC) (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o- terphenyl (Surr) (1C)	*98*		*10 - 168*	*01/03/22 17:17*	*01/04/22 15:39*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**10.6**	**!**	1.0	1.0	%			12/22/21 10:08	1

Client Sample ID: UDEX-CD-08D-19_20211220

Lab Sample ID: 410-67745-6

Date Collected: 12/20/21 16:10
Matrix: Solid
Date Received: 12/21/21 15:47
Percent Solids: 82.9

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	**6900**		1100	190	mg/Kg	☼	12/22/21 10:31	12/28/21 19:50	20000

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene (fid) (1C)	*562*	*S1+*	*50 - 142*	*12/22/21 10:31*	*12/28/21 19:50*	*20000*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	ND		14	6.0	mg/Kg	☼	01/03/22 17:17	01/04/22 16:00	1
>C22-C44 (1C)	ND		14	6.0	mg/Kg	☼	01/03/22 17:17	01/04/22 16:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Chlorobenzene (Surr) (1C)	*62*		*10 - 131*	*01/03/22 17:17*	*01/04/22 16:00*	*1*
o- terphenyl (Surr) (1C)	*99*		*10 - 168*	*01/03/22 17:17*	*01/04/22 16:00*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**17.1**	**!**	1.0	1.0	%			12/22/21 10:08	1

Client Sample ID: UDEX-CD-01-14-20211221

Lab Sample ID: 410-67745-7

Date Collected: 12/21/21 09:50
Matrix: Solid
Date Received: 12/21/21 15:47
Percent Solids: 89.1

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	**1.1**	**J**	1.4	0.25	mg/Kg	☼	12/22/21 10:31	12/28/21 21:45	25

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene (fid) (1C)	*100*		*50 - 142*	*12/22/21 10:31*	*12/28/21 21:45*	*25*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	**34**		13	5.6	mg/Kg	☼	01/03/22 17:17	01/04/22 17:04	1
>C22-C44 (1C)	ND		13	5.6	mg/Kg	☼	01/03/22 17:17	01/04/22 17:04	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Chlorobenzene (Surr) (1C)	*72*		*10 - 131*	*01/03/22 17:17*	*01/04/22 17:04*	*1*
o- terphenyl (Surr) (1C)	*101*		*10 - 168*	*01/03/22 17:17*	*01/04/22 17:04*	*1*

Client Sample ID: UDEX-CD-01-14-20211221 — Lab Sample ID: 410-67745-7

Date Collected: 12/21/21 09:50 — **Matrix: Solid**
Date Received: 12/21/21 15:47 — **Percent Solids: 89.1**

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	10.9	!	1.0	1.0	%			12/22/21 10:08	1

Client Sample ID: UDEX-CD-01-15-20211221 — Lab Sample ID: 410-67745-8

Date Collected: 12/21/21 09:55 — **Matrix: Solid**
Date Received: 12/21/21 15:47 — **Percent Solids: 88.4**

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	3400		490	88	mg/Kg	☼	12/22/21 10:31	12/28/21 22:24	10000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*1031*	*S1+*	*50 - 142*	*12/22/21 10:31*	*12/28/21 22:24*	*10000*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	ND		13	5.6	mg/Kg	☼	01/03/22 17:17	01/04/22 18:03	1
>C22-C44 (1C)	7.8	J	13	5.6	mg/Kg	☼	01/03/22 17:17	01/04/22 18:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*69*		*10 - 131*	*01/03/22 17:17*	*01/04/22 18:03*	*1*
o- terphenyl (Surr) (1C)	*97*		*10 - 168*	*01/03/22 17:17*	*01/04/22 18:03*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	11.6	!	1.0	1.0	%			12/22/21 10:08	1

Client Sample ID: UDEX-CD-01-16-20211221 — Lab Sample ID: 410-67745-9

Date Collected: 12/21/21 10:00 — **Matrix: Solid**
Date Received: 12/21/21 15:47 — **Percent Solids: 89.6**

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	2000		430	78	mg/Kg	☼	12/22/21 10:31	12/28/21 23:03	10000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*772*	*S1+*	*50 - 142*	*12/22/21 10:31*	*12/28/21 23:03*	*10000*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	180		13	5.6	mg/Kg	☼	01/03/22 17:17	01/04/22 19:07	1
>C22-C44 (1C)	110		13	5.6	mg/Kg	☼	01/03/22 17:17	01/04/22 19:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*75*		*10 - 131*	*01/03/22 17:17*	*01/04/22 19:07*	*1*
o- terphenyl (Surr) (1C)	*156*		*10 - 168*	*01/03/22 17:17*	*01/04/22 19:07*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	10.4	!	1.0	1.0	%			12/22/21 10:08	1

Client Sample ID: UDEX-CD-01-17-20211221
Lab Sample ID: 410-67745-10

Date Collected: 12/21/21 10:05
Matrix: Solid
Date Received: 12/21/21 15:47
Percent Solids: 85.2

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	43		5.1	0.92	mg/Kg	☼	12/22/21 10:31	12/30/21 19:37	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*90*		*50 - 142*	*12/22/21 10:31*	*12/30/21 19:37*	*100*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	ND		14	5.9	mg/Kg	☼	01/03/22 17:17	01/04/22 16:21	1
>C22-C44 (1C)	ND		14	5.9	mg/Kg	☼	01/03/22 17:17	01/04/22 16:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*0.8*	*S1-*	*10 - 131*	*01/03/22 17:17*	*01/04/22 16:21*	*1*
o- terphenyl (Surr) (1C)	*5*	*S1-*	*10 - 168*	*01/03/22 17:17*	*01/04/22 16:21*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	14.8	!	1.0	1.0	%			12/22/21 10:08	1

Client Sample ID: UDEX-CD-01-18-20211221
Lab Sample ID: 410-67745-11

Date Collected: 12/21/21 10:10
Matrix: Solid
Date Received: 12/21/21 15:47
Percent Solids: 81.6

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	0.66	J	1.4	0.24	mg/Kg	☼	12/22/21 10:33	12/30/21 17:05	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*68*		*50 - 142*	*12/22/21 10:33*	*12/30/21 17:05*	*25*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	ND		15	6.1	mg/Kg	☼	01/03/22 17:17	01/04/22 16:43	1
>C22-C44 (1C)	ND		15	6.1	mg/Kg	☼	01/03/22 17:17	01/04/22 16:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*21*		*10 - 131*	*01/03/22 17:17*	*01/04/22 16:43*	*1*
o- terphenyl (Surr) (1C)	*40*		*10 - 168*	*01/03/22 17:17*	*01/04/22 16:43*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	18.3	!	1.0	1.0	%			12/22/21 10:46	1

Surrogate Summary

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67745-1

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)						
Lab Sample ID	Client Sample ID	TFT-F1 (50-142)						
410-67745-1	UDEX-01HPT-02-12_20211220	107						
410-67745-2	UDEX-01HPT-02-13_20211220	105						
410-67745-3	UDEX-CD-08D-16_20211220	107						
410-67745-4	UDEX-CD-08D-17_20211220	119						
410-67745-5	UDEX-CD-08D-18_20211220	320 S1+						
410-67745-6	UDEX-CD-08D-19_20211220	562 S1+						
410-67745-7	UDEX-CD-01-14-20211221	100						
410-67745-8	UDEX-CD-01-15-20211221	1031 S1+						
410-67745-9	UDEX-CD-01-16-20211221	772 S1+						
410-67745-10	UDEX-CD-01-17-20211221	90						
410-67745-11	UDEX-CD-01-18-20211221	68						
LCS 410-209215/6	Lab Control Sample	116						
LCS 410-210543/5	Lab Control Sample	87						
LCSD 410-209215/7	Lab Control Sample Dup	115						
LCSD 410-210543/6	Lab Control Sample Dup	88						
MB 410-209215/5	Method Blank	119						
MB 410-210543/4	Method Blank	82						

Surrogate Legend

TFT-F = a,a,a-Trifluorotoluene (fid)

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)						
Lab Sample ID	Client Sample ID	CBNZ1 (10-131)	OTP1 (10-168)					
410-67745-1	UDEX-01HPT-02-12_20211220	74	113					
410-67745-2	UDEX-01HPT-02-13_20211220	75	98					
410-67745-3	UDEX-CD-08D-16_20211220	75	107					
410-67745-4	UDEX-CD-08D-17_20211220	71	93					
410-67745-5	UDEX-CD-08D-18_20211220	73	98					
410-67745-6	UDEX-CD-08D-19_20211220	62	99					
410-67745-7	UDEX-CD-01-14-20211221	72	101					
410-67745-8	UDEX-CD-01-15-20211221	69	97					
410-67745-8 DU	UDEX-CD-01-15-20211221	76	103					
410-67745-8 MS	UDEX-CD-01-15-20211221	70	104					
410-67745-9	UDEX-CD-01-16-20211221	75	156					
410-67745-10	UDEX-CD-01-17-20211221	0.8 S1-	5 S1-					
410-67745-11	UDEX-CD-01-18-20211221	21	40					
LCS 410-211245/2-A	Lab Control Sample	72	106					
MB 410-211245/1-A	Method Blank	77	100					

Surrogate Legend

CBNZ = Chlorobenzene (Surr)

OTP = o- terphenyl (Surr)

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Lab Sample ID: MB 410-209215/5
Matrix: Solid
Analysis Batch: 209215

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	ND		1.0	0.18	mg/Kg			12/28/21 14:41	25

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*119*		*50 - 142*		*12/28/21 14:41*	*25*

Lab Sample ID: LCS 410-209215/6
Matrix: Solid
Analysis Batch: 209215

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (1C)			11.0	11.2		mg/Kg		101	60 - 132		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*116*		*50 - 142*

Lab Sample ID: LCSD 410-209215/7
Matrix: Solid
Analysis Batch: 209215

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (1C)			11.0	11.1		mg/Kg		101	60 - 132	0	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*115*		*50 - 142*

Lab Sample ID: MB 410-210543/4
Matrix: Solid
Analysis Batch: 210543

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	ND		1.0	0.18	mg/Kg			12/30/21 12:45	25

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*82*		*50 - 142*		*12/30/21 12:45*	*25*

Lab Sample ID: LCS 410-210543/5
Matrix: Solid
Analysis Batch: 210543

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (1C)			11.0	9.06		mg/Kg		82	60 - 132		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*87*		*50 - 142*

Method: 8015D - Gasoline Range Organics (GRO) (GC) (Continued)

Lab Sample ID: LCSD 410-210543/6
Matrix: Solid
Analysis Batch: 210543

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (1C)			11.0	9.06		mg/Kg		82	60 - 132	0	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*88*		*50 - 142*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 410-211245/1-A
Matrix: Solid
Analysis Batch: 211496

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 211245

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	ND		12	5.0	mg/Kg		01/03/22 17:17	01/04/22 13:31	1
>C22-C44 (1C)	ND		12	5.0	mg/Kg		01/03/22 17:17	01/04/22 13:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*77*		*10 - 131*	*01/03/22 17:17*	*01/04/22 13:31*	*1*
o- terphenyl (Surr) (1C)	*100*		*10 - 168*	*01/03/22 17:17*	*01/04/22 13:31*	*1*

Lab Sample ID: LCS 410-211245/2-A
Matrix: Solid
Analysis Batch: 211496

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 211245

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
DRO (C10-C28) (1C)			133	113		mg/Kg		84	70 - 115		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Chlorobenzene (Surr) (1C)	*72*		*10 - 131*
o- terphenyl (Surr) (1C)	*106*		*10 - 168*

Lab Sample ID: 410-67745-8 MS
Matrix: Solid
Analysis Batch: 211496

Client Sample ID: UDEX-CD-01-15-20211221
Prep Type: Total/NA
Prep Batch: 211245

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
DRO (C10-C28) (1C)	8.4	J	149	120		mg/Kg	☼	75	70 - 115		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Chlorobenzene (Surr) (1C)	*70*		*10 - 131*
o- terphenyl (Surr) (1C)	*104*		*10 - 168*

Lab Sample ID: 410-67745-8 DU
Matrix: Solid
Analysis Batch: 211496

Client Sample ID: UDEX-CD-01-15-20211221
Prep Type: Total/NA
Prep Batch: 211245

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
>C12-C22 (1C)	ND			5.72	J	mg/Kg	☼			NC	20
>C22-C44 (1C)	7.8	J		8.61	J	mg/Kg	☼			10	20

Method: 8015D TPH - Diesel Range Organics (DRO) (GC) (Continued)

Surrogate	DU %Recovery	DU Qualifier	Limits
Chlorobenzene (Surr) (1C)	76		10 - 131
o- terphenyl (Surr) (1C)	103		10 - 168

GC VOA

Prep Batch: 208460

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67745-1	UDEX-01HPT-02-12_20211220	Total/NA	Solid	5035	
410-67745-2	UDEX-01HPT-02-13_20211220	Total/NA	Solid	5035	
410-67745-3	UDEX-CD-08D-16_20211220	Total/NA	Solid	5035	
410-67745-4	UDEX-CD-08D-17_20211220	Total/NA	Solid	5035	
410-67745-5	UDEX-CD-08D-18_20211220	Total/NA	Solid	5035	
410-67745-6	UDEX-CD-08D-19_20211220	Total/NA	Solid	5035	
410-67745-7	UDEX-CD-01-14-20211221	Total/NA	Solid	5035	
410-67745-8	UDEX-CD-01-15-20211221	Total/NA	Solid	5035	
410-67745-9	UDEX-CD-01-16-20211221	Total/NA	Solid	5035	
410-67745-10	UDEX-CD-01-17-20211221	Total/NA	Solid	5035	
410-67745-11	UDEX-CD-01-18-20211221	Total/NA	Solid	5035	

Analysis Batch: 209215

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67745-1	UDEX-01HPT-02-12_20211220	Total/NA	Solid	8015D	208460
410-67745-2	UDEX-01HPT-02-13_20211220	Total/NA	Solid	8015D	208460
410-67745-3	UDEX-CD-08D-16_20211220	Total/NA	Solid	8015D	208460
410-67745-6	UDEX-CD-08D-19_20211220	Total/NA	Solid	8015D	208460
410-67745-7	UDEX-CD-01-14-20211221	Total/NA	Solid	8015D	208460
410-67745-8	UDEX-CD-01-15-20211221	Total/NA	Solid	8015D	208460
410-67745-9	UDEX-CD-01-16-20211221	Total/NA	Solid	8015D	208460
MB 410-209215/5	Method Blank	Total/NA	Solid	8015D	
LCS 410-209215/6	Lab Control Sample	Total/NA	Solid	8015D	
LCSD 410-209215/7	Lab Control Sample Dup	Total/NA	Solid	8015D	

Analysis Batch: 210543

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67745-4	UDEX-CD-08D-17_20211220	Total/NA	Solid	8015D	208460
410-67745-5	UDEX-CD-08D-18_20211220	Total/NA	Solid	8015D	208460
410-67745-10	UDEX-CD-01-17-20211221	Total/NA	Solid	8015D	208460
410-67745-11	UDEX-CD-01-18-20211221	Total/NA	Solid	8015D	208460
MB 410-210543/4	Method Blank	Total/NA	Solid	8015D	
LCS 410-210543/5	Lab Control Sample	Total/NA	Solid	8015D	
LCSD 410-210543/6	Lab Control Sample Dup	Total/NA	Solid	8015D	

GC Semi VOA

Prep Batch: 211245

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67745-1	UDEX-01HPT-02-12_20211220	Total/NA	Solid	3546	
410-67745-2	UDEX-01HPT-02-13_20211220	Total/NA	Solid	3546	
410-67745-3	UDEX-CD-08D-16_20211220	Total/NA	Solid	3546	
410-67745-4	UDEX-CD-08D-17_20211220	Total/NA	Solid	3546	
410-67745-5	UDEX-CD-08D-18_20211220	Total/NA	Solid	3546	
410-67745-6	UDEX-CD-08D-19_20211220	Total/NA	Solid	3546	
410-67745-7	UDEX-CD-01-14-20211221	Total/NA	Solid	3546	
410-67745-8	UDEX-CD-01-15-20211221	Total/NA	Solid	3546	
410-67745-9	UDEX-CD-01-16-20211221	Total/NA	Solid	3546	
410-67745-10	UDEX-CD-01-17-20211221	Total/NA	Solid	3546	
410-67745-11	UDEX-CD-01-18-20211221	Total/NA	Solid	3546	
MB 410-211245/1-A	Method Blank	Total/NA	Solid	3546	

GC Semi VOA (Continued)

Prep Batch: 211245 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 410-211245/2-A	Lab Control Sample	Total/NA	Solid	3546	
410-67745-8 MS	UDEX-CD-01-15-20211221	Total/NA	Solid	3546	
410-67745-8 DU	UDEX-CD-01-15-20211221	Total/NA	Solid	3546	

Analysis Batch: 211496

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67745-1	UDEX-01HPT-02-12_20211220	Total/NA	Solid	8015D TPH	211245
410-67745-2	UDEX-01HPT-02-13_20211220	Total/NA	Solid	8015D TPH	211245
410-67745-3	UDEX-CD-08D-16_20211220	Total/NA	Solid	8015D TPH	211245
410-67745-4	UDEX-CD-08D-17_20211220	Total/NA	Solid	8015D TPH	211245
410-67745-5	UDEX-CD-08D-18_20211220	Total/NA	Solid	8015D TPH	211245
410-67745-6	UDEX-CD-08D-19_20211220	Total/NA	Solid	8015D TPH	211245
410-67745-7	UDEX-CD-01-14-20211221	Total/NA	Solid	8015D TPH	211245
410-67745-8	UDEX-CD-01-15-20211221	Total/NA	Solid	8015D TPH	211245
410-67745-9	UDEX-CD-01-16-20211221	Total/NA	Solid	8015D TPH	211245
410-67745-10	UDEX-CD-01-17-20211221	Total/NA	Solid	8015D TPH	211245
410-67745-11	UDEX-CD-01-18-20211221	Total/NA	Solid	8015D TPH	211245
MB 410-211245/1-A	Method Blank	Total/NA	Solid	8015D TPH	211245
LCS 410-211245/2-A	Lab Control Sample	Total/NA	Solid	8015D TPH	211245
410-67745-8 MS	UDEX-CD-01-15-20211221	Total/NA	Solid	8015D TPH	211245
410-67745-8 DU	UDEX-CD-01-15-20211221	Total/NA	Solid	8015D TPH	211245

General Chemistry

Analysis Batch: 208452

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67745-1	UDEX-01HPT-02-12_20211220	Total/NA	Solid	Moisture	
410-67745-2	UDEX-01HPT-02-13_20211220	Total/NA	Solid	Moisture	
410-67745-3	UDEX-CD-08D-16_20211220	Total/NA	Solid	Moisture	
410-67745-4	UDEX-CD-08D-17_20211220	Total/NA	Solid	Moisture	
410-67745-5	UDEX-CD-08D-18_20211220	Total/NA	Solid	Moisture	
410-67745-6	UDEX-CD-08D-19_20211220	Total/NA	Solid	Moisture	
410-67745-7	UDEX-CD-01-14-20211221	Total/NA	Solid	Moisture	
410-67745-8	UDEX-CD-01-15-20211221	Total/NA	Solid	Moisture	
410-67745-9	UDEX-CD-01-16-20211221	Total/NA	Solid	Moisture	
410-67745-10	UDEX-CD-01-17-20211221	Total/NA	Solid	Moisture	
410-67745-11	UDEX-CD-01-18-20211221	Total/NA	Solid	Moisture	

Client Sample ID: UDEX-01HPT-02-12_20211220 — **Lab Sample ID: 410-67745-1**
Date Collected: 12/20/21 12:40 — **Matrix: Solid**
Date Received: 12/21/21 15:47

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	208452	12/22/21 10:08	UVJN	ELLE

Client Sample ID: UDEX-01HPT-02-12_20211220 — **Lab Sample ID: 410-67745-1**
Date Collected: 12/20/21 12:40 — **Matrix: Solid**
Date Received: 12/21/21 15:47 — **Percent Solids: 96.2**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			208460	12/22/21 10:13	JJT8	ELLE
Total/NA	Analysis	8015D		25	209215	12/28/21 16:37	JJT8	ELLE
Total/NA	Prep	3546			211245	01/03/22 17:17	QQ3P	ELLE
Total/NA	Analysis	8015D TPH		1	211496	01/04/22 14:13	KP5X	ELLE

Client Sample ID: UDEX-01HPT-02-13_20211220 — **Lab Sample ID: 410-67745-2**
Date Collected: 12/20/21 12:50 — **Matrix: Solid**
Date Received: 12/21/21 15:47

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	208452	12/22/21 10:08	UVJN	ELLE

Client Sample ID: UDEX-01HPT-02-13_20211220 — **Lab Sample ID: 410-67745-2**
Date Collected: 12/20/21 12:50 — **Matrix: Solid**
Date Received: 12/21/21 15:47 — **Percent Solids: 91.6**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			208460	12/22/21 10:13	JJT8	ELLE
Total/NA	Analysis	8015D		25	209215	12/28/21 17:15	JJT8	ELLE
Total/NA	Prep	3546			211245	01/03/22 17:17	QQ3P	ELLE
Total/NA	Analysis	8015D TPH		1	211496	01/04/22 14:35	KP5X	ELLE

Client Sample ID: UDEX-CD-08D-16_20211220 — **Lab Sample ID: 410-67745-3**
Date Collected: 12/20/21 15:40 — **Matrix: Solid**
Date Received: 12/21/21 15:47

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	208452	12/22/21 10:08	UVJN	ELLE

Client Sample ID: UDEX-CD-08D-16_20211220 — **Lab Sample ID: 410-67745-3**
Date Collected: 12/20/21 15:40 — **Matrix: Solid**
Date Received: 12/21/21 15:47 — **Percent Solids: 94.7**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			208460	12/22/21 10:13	JJT8	ELLE
Total/NA	Analysis	8015D		25	209215	12/28/21 17:54	JJT8	ELLE
Total/NA	Prep	3546			211245	01/03/22 17:17	QQ3P	ELLE
Total/NA	Analysis	8015D TPH		1	211496	01/04/22 14:56	KP5X	ELLE

Lab Chronicle

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67745-1

Client Sample ID: UDEX-CD-08D-17_20211220 — Lab Sample ID: 410-67745-4

Date Collected: 12/20/21 15:50
Date Received: 12/21/21 15:47
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	208452	12/22/21 10:08	UVJN	ELLE

Client Sample ID: UDEX-CD-08D-17_20211220 — Lab Sample ID: 410-67745-4

Date Collected: 12/20/21 15:50
Date Received: 12/21/21 15:47
Matrix: Solid
Percent Solids: 86.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			208460	12/22/21 10:13	JJT8	ELLE
Total/NA	Analysis	8015D		1000	210543	12/30/21 19:01	JJT8	ELLE
Total/NA	Prep	3546			211245	01/03/22 17:17	QQ3P	ELLE
Total/NA	Analysis	8015D TPH		1	211496	01/04/22 15:17	KP5X	ELLE

Client Sample ID: UDEX-CD-08D-18_20211220 — Lab Sample ID: 410-67745-5

Date Collected: 12/20/21 16:00
Date Received: 12/21/21 15:47
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	208452	12/22/21 10:08	UVJN	ELLE

Client Sample ID: UDEX-CD-08D-18_20211220 — Lab Sample ID: 410-67745-5

Date Collected: 12/20/21 16:00
Date Received: 12/21/21 15:47
Matrix: Solid
Percent Solids: 89.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			208460	12/22/21 10:31	JJT8	ELLE
Total/NA	Analysis	8015D		5000	210543	12/30/21 17:41	JJT8	ELLE
Total/NA	Prep	3546			211245	01/03/22 17:17	QQ3P	ELLE
Total/NA	Analysis	8015D TPH		1	211496	01/04/22 15:39	KP5X	ELLE

Client Sample ID: UDEX-CD-08D-19_20211220 — Lab Sample ID: 410-67745-6

Date Collected: 12/20/21 16:10
Date Received: 12/21/21 15:47
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	208452	12/22/21 10:08	UVJN	ELLE

Client Sample ID: UDEX-CD-08D-19_20211220 — Lab Sample ID: 410-67745-6

Date Collected: 12/20/21 16:10
Date Received: 12/21/21 15:47
Matrix: Solid
Percent Solids: 82.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			208460	12/22/21 10:31	JJT8	ELLE
Total/NA	Analysis	8015D		20000	209215	12/28/21 19:50	JJT8	ELLE
Total/NA	Prep	3546			211245	01/03/22 17:17	QQ3P	ELLE
Total/NA	Analysis	8015D TPH		1	211496	01/04/22 16:00	KP5X	ELLE

Client Sample ID: UDEX-CD-01-14-20211221

Lab Sample ID: 410-67745-7

Date Collected: 12/21/21 09:50

Matrix: Solid

Date Received: 12/21/21 15:47

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	208452	12/22/21 10:08	UVJN	ELLE

Client Sample ID: UDEX-CD-01-14-20211221

Lab Sample ID: 410-67745-7

Date Collected: 12/21/21 09:50

Matrix: Solid

Date Received: 12/21/21 15:47

Percent Solids: 89.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			208460	12/22/21 10:31	JJT8	ELLE
Total/NA	Analysis	8015D		25	209215	12/28/21 21:45	JJT8	ELLE
Total/NA	Prep	3546			211245	01/03/22 17:17	QQ3P	ELLE
Total/NA	Analysis	8015D TPH		1	211496	01/04/22 17:04	KP5X	ELLE

Client Sample ID: UDEX-CD-01-15-20211221

Lab Sample ID: 410-67745-8

Date Collected: 12/21/21 09:55

Matrix: Solid

Date Received: 12/21/21 15:47

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	208452	12/22/21 10:08	UVJN	ELLE

Client Sample ID: UDEX-CD-01-15-20211221

Lab Sample ID: 410-67745-8

Date Collected: 12/21/21 09:55

Matrix: Solid

Date Received: 12/21/21 15:47

Percent Solids: 88.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			208460	12/22/21 10:31	JJT8	ELLE
Total/NA	Analysis	8015D		10000	209215	12/28/21 22:24	JJT8	ELLE
Total/NA	Prep	3546			211245	01/03/22 17:17	QQ3P	ELLE
Total/NA	Analysis	8015D TPH		1	211496	01/04/22 18:03	KP5X	ELLE

Client Sample ID: UDEX-CD-01-16-20211221

Lab Sample ID: 410-67745-9

Date Collected: 12/21/21 10:00

Matrix: Solid

Date Received: 12/21/21 15:47

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	208452	12/22/21 10:08	UVJN	ELLE

Client Sample ID: UDEX-CD-01-16-20211221

Lab Sample ID: 410-67745-9

Date Collected: 12/21/21 10:00

Matrix: Solid

Date Received: 12/21/21 15:47

Percent Solids: 89.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			208460	12/22/21 10:31	JJT8	ELLE
Total/NA	Analysis	8015D		10000	209215	12/28/21 23:03	JJT8	ELLE
Total/NA	Prep	3546			211245	01/03/22 17:17	QQ3P	ELLE
Total/NA	Analysis	8015D TPH		1	211496	01/04/22 19:07	KP5X	ELLE

Lab Chronicle

Client: Stantec Consulting Corp.
Job ID: 410-67745-1
Project/Site: UDEX Confirmation Drilling

Client Sample ID: UDEX-CD-01-17-20211221
Lab Sample ID: 410-67745-10
Date Collected: 12/21/21 10:05
Matrix: Solid
Date Received: 12/21/21 15:47

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	208452	12/22/21 10:08	UVJN	ELLE

Client Sample ID: UDEX-CD-01-17-20211221
Lab Sample ID: 410-67745-10
Date Collected: 12/21/21 10:05
Matrix: Solid
Date Received: 12/21/21 15:47
Percent Solids: 85.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			208460	12/22/21 10:31	JJT8	ELLE
Total/NA	Analysis	8015D		100	210543	12/30/21 19:37	JJT8	ELLE
Total/NA	Prep	3546			211245	01/03/22 17:17	QQ3P	ELLE
Total/NA	Analysis	8015D TPH		1	211496	01/04/22 16:21	KP5X	ELLE

Client Sample ID: UDEX-CD-01-18-20211221
Lab Sample ID: 410-67745-11
Date Collected: 12/21/21 10:10
Matrix: Solid
Date Received: 12/21/21 15:47

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	208452	12/22/21 10:46	UVJN	ELLE

Client Sample ID: UDEX-CD-01-18-20211221
Lab Sample ID: 410-67745-11
Date Collected: 12/21/21 10:10
Matrix: Solid
Date Received: 12/21/21 15:47
Percent Solids: 81.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			208460	12/22/21 10:33	JJT8	ELLE
Total/NA	Analysis	8015D		25	210543	12/30/21 17:05	JJT8	ELLE
Total/NA	Prep	3546			211245	01/03/22 17:17	QQ3P	ELLE
Total/NA	Analysis	8015D TPH		1	211496	01/04/22 16:43	KP5X	ELLE

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Stantec Consulting Corp.
Job ID: 410-67745-1
Project/Site: UDEX Confirmation Drilling

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Pennsylvania	NELAP	36-00037	01-31-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture

Method Summary

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67745-1

Method	Method Description	Protocol	Laboratory
8015D	Gasoline Range Organics (GRO) (GC)	SW846	ELLE
8015D TPH	Diesel Range Organics (DRO) (GC)	SW846	ELLE
Moisture	Percent Moisture	EPA	ELLE
3546	Microwave Extraction	SW846	ELLE
5035	Closed System Purge and Trap	SW846	ELLE

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: Stantec Consulting Corp.
Project/Site: UDEX Confirmation Drilling

Job ID: 410-67745-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-67745-1	UDEX-01HPT-02-12_20211220	Solid	12/20/21 12:40	12/21/21 15:47
410-67745-2	UDEX-01HPT-02-13_20211220	Solid	12/20/21 12:50	12/21/21 15:47
410-67745-3	UDEX-CD-08D-16_20211220	Solid	12/20/21 15:40	12/21/21 15:47
410-67745-4	UDEX-CD-08D-17_20211220	Solid	12/20/21 15:50	12/21/21 15:47
410-67745-5	UDEX-CD-08D-18_20211220	Solid	12/20/21 16:00	12/21/21 15:47
410-67745-6	UDEX-CD-08D-19_20211220	Solid	12/20/21 16:10	12/21/21 15:47
410-67745-7	UDEX-CD-01-14-20211221	Solid	12/21/21 09:50	12/21/21 15:47
410-67745-8	UDEX-CD-01-15-20211221	Solid	12/21/21 09:55	12/21/21 15:47
410-67745-9	UDEX-CD-01-16-20211221	Solid	12/21/21 10:00	12/21/21 15:47
410-67745-10	UDEX-CD-01-17-20211221	Solid	12/21/21 10:05	12/21/21 15:47
410-67745-11	UDEX-CD-01-18-20211221	Solid	12/21/21 10:10	12/21/21 15:47

Environmental Analysis Request and Chain of Custody

eurofins | Lancaster Laboratories Environmental

Acct. # _____

410-67745 Chain of Custody

...ental use only

COC #615429

Client Information

Client: PES C/O STANTEC	Acct. #:
Project Name/#: UDEX CONFIRMATION DRILLING	PWSID #:
Project Manager: ANDREW KLINGBEIL	P.O. #: 2134073039
Sampler: ANDREA HILL, Dane Hopkins	Quote #:
State where samples were collected: PA	For Compliance: Yes ☐ No ☑

Matrix: Soil ☒ Sediment ☐ Tissue ☐ | Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐ | Other: _____

Analysis Requested — Preservation and Filtration Codes

For Lab Use Only
FSC: _____
SCR#: _____

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 P=H_3PO_4
F=Field Filtered O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Total # of Containers	TPH - GRO 8015	TPH - CUSTOM RANGES 8015	Remarks
UDEX-01HPT-02-12-20211220	12/20/21	1240	X		X	4	X	X	
UDEX-01HPT-02-13-20211220	12/20/21	1250	X		X	4	X	X	
UDEX-CD-08D-16-20211220	12/20/21	1540	X		X	4	X	X	
UDEX-CD-08D-17-20211220	12/20/21	1550	X		X	4	X	X	
UDEX-CD-08D-18-20211220	12/20/21	1600	X		X	4	X	X	
UDEX-CD-08D-19-20211220	12/20/21	1610	X		X	4	X	X	
UDEX-CD-01-14-20211221	12/21/21	0950	X		X	4	X	X	
UDEX-CD-01-15-20211221	↓	0955	X		X	4	X	X	
UDEX-CD-01-16-20211221		1000	X		X	4	X	X	
UDEX-CD-01-17-20211221	↓	1005	X		X	4	X	X	

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: _____

E-mail address: _____

Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP) | Type VI (Raw Data Only)
Type III (Reduced non-CLP) | NJ DKQP | TX TRRP-13
NYSDEC Category A or B | MA MCP | CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	12/21/21	1240	Pierre	12/21/21	1240
Pierre	12/21/21	15-3?			
			[signature]	12/21/21	1547

EDD Required? Yes No
If yes, format: EQUIS EDD

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS _____ FedEx _____ Other _____

Temperature upon receipt 0.4 °C

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7044 0919

AP

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # _____ Group # _____ Sample # _____

COC # 615426

Client Information

Client: PES c/o Stantec	Acct. #:
Project Name/#: UDEX Confirmation Drilling	PWSID #:
Project Manager: Andrew Klingbeil	P.O. #: 213403039
Sampler: Dane Hopkins	Quote #:
State where samples were collected: PA	For Compliance: Yes ☐ No ☑

Matrix

Soil ☒ Sediment ☐ Tissue ☐ | Water: Potable ☐ Ground ☐ Surface ☐ NPDES ☐ | Other: ____

Analysis Requested

Preservation and Filtration Codes

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	TPH-GRO 8015	TPH - Custom Range 8015
UDEX-CD-01-18-20211221	12/21/21	1010	X		4	X	X

For Lab Use Only

FSC: _____

SCR#: _____

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 P=H_3PO_4
F=Field Filtered O=Other

Remarks

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Requested TAT in business days: _____

E-mail address: andrew.klingbeil@stantec.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) | Type VI (Raw Data Only)

Type III (Reduced non-CLP) | NJ DKQP | TX TRRP-13

NYSDEC Category A or B | MA MCP | CT RCP

Relinquished by	Date	Time	Received by	Date	Time
Dane	12/21	1240	Pierre	12/21	1240
Pierre	12/21	1530			
			Received by (2)		
			Received by (3)		

EDD Required? Yes No

If yes, format: EQuIS EDD

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS _____ FedEx _____ Other _____

Temperature upon receipt 0.4 °C

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7044 0919

Login Sample Receipt Checklist

Client: Stantec Consulting Corp.

Job Number: 410-67745-1

Login Number: 67745

List Source: Eurofins Lancaster Laboratories Env, LLC

List Number: 1

Creator: Phillips, Ann-Marie E

Question	Answer	Comment
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	N/A	

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ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Tel: (717)656-2300

Laboratory Job ID: 410-67974-1
Client Project/Site: PES UDEX Release Confirmation Drilling

For:
Stantec Consulting Corp.
1060 Andrew Drive
Suite 140
West Chester, Pennsylvania 19380

Attn: Andrew Klingbeil

Authorized for release by:
1/6/2022 4:27:20 PM

Amek Carter, Project Manager
(717)556-7252
Loran.Carter@eurofinset.com

LINKS

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The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

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Amek Carter
Project Manager
1/6/2022 4:27:20 PM

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Definitions/Glossary

Client: Stantec Consulting Corp. Job ID: 410-67974-1
Project/Site: PES UDEX Release Confirmation Drilling

Qualifiers

GC VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
S1-	Surrogate recovery exceeds control limits, low biased.
S1+	Surrogate recovery exceeds control limits, high biased.

GC Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
S1+	Surrogate recovery exceeds control limits, high biased.

General Chemistry

Qualifier	Qualifier Description
!	Laboratory is not accredited for this parameter.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Stantec Consulting Corp. Job ID: 410-67974-1
Project/Site: PES UDEX Release Confirmation Drilling

Job ID: 410-67974-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Narrative

Job Narrative
410-67974-1

Receipt
The samples were received on 12/22/2021 6:15 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 2.7°C

Gasoline Range Organics
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Diesel Range Organics
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: Stantec Consulting Corp.
Job ID: 410-67974-1
Project/Site: PES UDEX Release Confirmation Drilling

Client Sample ID: UDEX-CD-02A-15-20211221 — Lab Sample ID: 410-67974-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	0.22	J	1.1	0.20	mg/Kg	25	☼	8015D	Total/NA

Client Sample ID: UDEX-CD-02A-18-20211221 — Lab Sample ID: 410-67974-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	2600		510	92	mg/Kg	10000	☼	8015D	Total/NA

Client Sample ID: UDEX-CD-02A-20-20211221 — Lab Sample ID: 410-67974-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	11000		490	89	mg/Kg	10000	☼	8015D	Total/NA

Client Sample ID: UDEX-CD-09A-19-20211221 — Lab Sample ID: 410-67974-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	19000		2300	420	mg/Kg	50000	☼	8015D	Total/NA
>C12-C22 (1C)	4200		130	55	mg/Kg	10	☼	8015D TPH	Total/NA
>C22-C44 (1C)	140		130	55	mg/Kg	10	☼	8015D TPH	Total/NA

Client Sample ID: UDEX-CD-09A-20-20211221 — Lab Sample ID: 410-67974-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	22000		2700	480	mg/Kg	50000	☼	8015D	Total/NA
>C12-C22 (1C)	3900		130	56	mg/Kg	10	☼	8015D TPH	Total/NA
>C22-C44 (1C)	120	J	130	56	mg/Kg	10	☼	8015D TPH	Total/NA

Client Sample ID: UDEX-CD-09A-21-20211221 — Lab Sample ID: 410-67974-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (1C)	4200		500	91	mg/Kg	10000	☼	8015D	Total/NA
>C12-C22 (1C)	11000		350	150	mg/Kg	25	☼	8015D TPH	Total/NA
>C22-C44 (1C)	300	J	350	150	mg/Kg	25	☼	8015D TPH	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: UDEX-CD-02A-15-20211221 — Lab Sample ID: 410-67974-1

Date Collected: 12/21/21 13:15 — **Matrix: Solid**
Date Received: 12/22/21 18:15 — **Percent Solids: 96.0**

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	0.22	J	1.1	0.20	mg/Kg	☼	12/22/21 20:25	12/29/21 01:15	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*91*		*50 - 142*	*12/22/21 20:25*	*12/29/21 01:15*	*25*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	ND		12	5.2	mg/Kg	☼	01/03/22 17:17	01/04/22 19:50	1
>C22-C44 (1C)	ND		12	5.2	mg/Kg	☼	01/03/22 17:17	01/04/22 19:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*76*		*10 - 131*	*01/03/22 17:17*	*01/04/22 19:50*	*1*
o- terphenyl (Surr) (1C)	*100*		*10 - 168*	*01/03/22 17:17*	*01/04/22 19:50*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.0	!	1.0	1.0	%			12/23/21 12:18	1

Client Sample ID: UDEX-CD-02A-18-20211221 — Lab Sample ID: 410-67974-2

Date Collected: 12/21/21 13:20 — **Matrix: Solid**
Date Received: 12/22/21 18:15 — **Percent Solids: 93.9**

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	2600		510	92	mg/Kg	☼	12/22/21 20:25	12/29/21 01:52	10000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*352*	*S1+*	*50 - 142*	*12/22/21 20:25*	*12/29/21 01:52*	*10000*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	ND		13	5.3	mg/Kg	☼	01/03/22 17:17	01/04/22 20:12	1
>C22-C44 (1C)	ND		13	5.3	mg/Kg	☼	01/03/22 17:17	01/04/22 20:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*71*		*10 - 131*	*01/03/22 17:17*	*01/04/22 20:12*	*1*
o- terphenyl (Surr) (1C)	*94*		*10 - 168*	*01/03/22 17:17*	*01/04/22 20:12*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	6.1	!	1.0	1.0	%			12/23/21 12:18	1

Client Sample ID: UDEX-CD-02A-20-20211221 — Lab Sample ID: 410-67974-3

Date Collected: 12/21/21 13:25 — **Matrix: Solid**
Date Received: 12/22/21 18:15 — **Percent Solids: 89.1**

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	11000		490	89	mg/Kg	☼	12/22/21 20:25	12/29/21 02:28	10000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*609*	*S1+*	*50 - 142*	*12/22/21 20:25*	*12/29/21 02:28*	*10000*

Client Sample ID: UDEX-CD-02A-20-20211221 — Lab Sample ID: 410-67974-3

Date Collected: 12/21/21 13:25 — **Matrix: Solid**
Date Received: 12/22/21 18:15 — **Percent Solids: 89.1**

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	ND		13	5.5	mg/Kg	☼	01/03/22 17:17	01/04/22 20:33	1
>C22-C44 (1C)	ND		13	5.5	mg/Kg	☼	01/03/22 17:17	01/04/22 20:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*75*		*10 - 131*	*01/03/22 17:17*	*01/04/22 20:33*	*1*
o- terphenyl (Surr) (1C)	*99*		*10 - 168*	*01/03/22 17:17*	*01/04/22 20:33*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	10.9	!	1.0	1.0	%			12/23/21 12:18	1

Client Sample ID: UDEX-CD-09A-19-20211221 — Lab Sample ID: 410-67974-4

Date Collected: 12/21/21 14:50 — **Matrix: Solid**
Date Received: 12/22/21 18:15 — **Percent Solids: 89.3**

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	19000		2300	420	mg/Kg	☼	12/22/21 20:25	12/30/21 20:13	50000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*0*	*S1-*	*50 - 142*	*12/22/21 20:25*	*12/30/21 20:13*	*50000*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	4200		130	55	mg/Kg	☼	01/03/22 17:17	01/06/22 15:47	10
>C22-C44 (1C)	140		130	55	mg/Kg	☼	01/03/22 17:17	01/06/22 15:47	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*209*	*S1+*	*10 - 131*	*01/03/22 17:17*	*01/06/22 15:47*	*10*
o- terphenyl (Surr) (1C)	*749*	*S1+*	*10 - 168*	*01/03/22 17:17*	*01/06/22 15:47*	*10*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	10.7	!	1.0	1.0	%			12/23/21 12:18	1

Client Sample ID: UDEX-CD-09A-20-20211221 — Lab Sample ID: 410-67974-5

Date Collected: 12/21/21 15:00 — **Matrix: Solid**
Date Received: 12/22/21 18:15 — **Percent Solids: 88.3**

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	22000		2700	480	mg/Kg	☼	12/22/21 20:25	12/30/21 20:49	50000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*0*	*S1-*	*50 - 142*	*12/22/21 20:25*	*12/30/21 20:49*	*50000*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	3900		130	56	mg/Kg	☼	01/03/22 17:17	01/06/22 16:08	10
>C22-C44 (1C)	120	J	130	56	mg/Kg	☼	01/03/22 17:17	01/06/22 16:08	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*249*	*S1+*	*10 - 131*	*01/03/22 17:17*	*01/06/22 16:08*	*10*

Client Sample ID: UDEX-CD-09A-20-20211221 — Lab Sample ID: 410-67974-5

Date Collected: 12/21/21 15:00 — **Matrix: Solid**
Date Received: 12/22/21 18:15 — **Percent Solids: 88.3**

Method: 8015D TPH - Diesel Range Organics (DRO) (GC) (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr) (1C)	*119*		*10 - 168*	*01/03/22 17:17*	*01/06/22 16:08*	*10*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	11.7	!	1.0	1.0	%			12/23/21 12:18	1

Client Sample ID: UDEX-CD-09A-21-20211221 — Lab Sample ID: 410-67974-6

Date Collected: 12/21/21 15:05 — **Matrix: Solid**
Date Received: 12/22/21 18:15 — **Percent Solids: 85.3**

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	4200		500	91	mg/Kg	☼	12/22/21 20:25	12/30/21 18:18	10000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*214*	*S1+*	*50 - 142*	*12/22/21 20:25*	*12/30/21 18:18*	*10000*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	11000		350	150	mg/Kg	☼	01/03/22 17:17	01/06/22 16:30	25
>C22-C44 (1C)	300	J	350	150	mg/Kg	☼	01/03/22 17:17	01/06/22 16:30	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*633*	*S1+*	*10 - 131*	*01/03/22 17:17*	*01/06/22 16:30*	*25*
o- terphenyl (Surr) (1C)	*130*		*10 - 168*	*01/03/22 17:17*	*01/06/22 16:30*	*25*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	14.7	!	1.0	1.0	%			12/23/21 12:18	1

Surrogate Summary

Client: Stantec Consulting Corp.
Job ID: 410-67974-1
Project/Site: PES UDEX Release Confirmation Drilling

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Matrix: Solid
Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)
		TFT-F1
Lab Sample ID	Client Sample ID	(50-142)
410-67974-1	UDEX-CD-02A-15-20211221	91
410-67974-2	UDEX-CD-02A-18-20211221	352 S1+
410-67974-3	UDEX-CD-02A-20-20211221	609 S1+
410-67974-4	UDEX-CD-09A-19-20211221	0 S1-
410-67974-5	UDEX-CD-09A-20-20211221	0 S1-
410-67974-6	UDEX-CD-09A-21-20211221	214 S1+
LCS 410-209213/5	Lab Control Sample	94
LCS 410-210543/5	Lab Control Sample	87
LCSD 410-209213/6	Lab Control Sample Dup	92
LCSD 410-210543/6	Lab Control Sample Dup	88
MB 410-209213/4	Method Blank	90
MB 410-210543/4	Method Blank	82

Surrogate Legend

TFT-F = a,a,a-Trifluorotoluene (fid)

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Matrix: Solid
Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
		CBNZ1	OTP1
Lab Sample ID	Client Sample ID	(10-131)	(10-168)
410-67974-1	UDEX-CD-02A-15-20211221	76	100
410-67974-2	UDEX-CD-02A-18-20211221	71	94
410-67974-3	UDEX-CD-02A-20-20211221	75	99
410-67974-4	UDEX-CD-09A-19-20211221	209 S1+	749 S1+
410-67974-5	UDEX-CD-09A-20-20211221	249 S1+	119
410-67974-6	UDEX-CD-09A-21-20211221	633 S1+	130
LCS 410-211245/2-A	Lab Control Sample	72	106
MB 410-211245/1-A	Method Blank	77	100

Surrogate Legend

CBNZ = Chlorobenzene (Surr)
OTP = o- terphenyl (Surr)

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Lab Sample ID: MB 410-209213/4
Matrix: Solid
Analysis Batch: 209213

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	ND		1.0	0.18	mg/Kg			12/28/21 14:40	25

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*90*		*50 - 142*		*12/28/21 14:40*	*25*

Lab Sample ID: LCS 410-209213/5
Matrix: Solid
Analysis Batch: 209213

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (1C)			11.0	9.94		mg/Kg		90	60 - 132		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*94*		*50 - 142*

Lab Sample ID: LCSD 410-209213/6
Matrix: Solid
Analysis Batch: 209213

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (1C)			11.0	9.68		mg/Kg		88	60 - 132	3	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*92*		*50 - 142*

Lab Sample ID: MB 410-210543/4
Matrix: Solid
Analysis Batch: 210543

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (1C)	ND		1.0	0.18	mg/Kg			12/30/21 12:45	25

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*82*		*50 - 142*		*12/30/21 12:45*	*25*

Lab Sample ID: LCS 410-210543/5
Matrix: Solid
Analysis Batch: 210543

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (1C)			11.0	9.06		mg/Kg		82	60 - 132		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*87*		*50 - 142*

Method: 8015D - Gasoline Range Organics (GRO) (GC) (Continued)

Lab Sample ID: LCSD 410-210543/6
Matrix: Solid
Analysis Batch: 210543

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (1C)			11.0	9.06		mg/Kg		82	60 - 132	0	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*88*		*50 - 142*

Method: 8015D TPH - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 410-211245/1-A
Matrix: Solid
Analysis Batch: 211496

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 211245

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
>C12-C22 (1C)	ND		12	5.0	mg/Kg		01/03/22 17:17	01/04/22 13:31	1
>C22-C44 (1C)	ND		12	5.0	mg/Kg		01/03/22 17:17	01/04/22 13:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Chlorobenzene (Surr) (1C)	*77*		*10 - 131*	*01/03/22 17:17*	*01/04/22 13:31*	*1*
o- terphenyl (Surr) (1C)	*100*		*10 - 168*	*01/03/22 17:17*	*01/04/22 13:31*	*1*

Lab Sample ID: LCS 410-211245/2-A
Matrix: Solid
Analysis Batch: 211496

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 211245

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
DRO (C10-C28) (1C)			133	113		mg/Kg		84	70 - 115		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Chlorobenzene (Surr) (1C)	*72*		*10 - 131*
o- terphenyl (Surr) (1C)	*106*		*10 - 168*

GC VOA

Prep Batch: 208757

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67974-1	UDEX-CD-02A-15-20211221	Total/NA	Solid	5035	
410-67974-2	UDEX-CD-02A-18-20211221	Total/NA	Solid	5035	
410-67974-3	UDEX-CD-02A-20-20211221	Total/NA	Solid	5035	
410-67974-4	UDEX-CD-09A-19-20211221	Total/NA	Solid	5035	
410-67974-5	UDEX-CD-09A-20-20211221	Total/NA	Solid	5035	
410-67974-6	UDEX-CD-09A-21-20211221	Total/NA	Solid	5035	

Analysis Batch: 209213

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67974-1	UDEX-CD-02A-15-20211221	Total/NA	Solid	8015D	208757
410-67974-2	UDEX-CD-02A-18-20211221	Total/NA	Solid	8015D	208757
410-67974-3	UDEX-CD-02A-20-20211221	Total/NA	Solid	8015D	208757
MB 410-209213/4	Method Blank	Total/NA	Solid	8015D	
LCS 410-209213/5	Lab Control Sample	Total/NA	Solid	8015D	
LCSD 410-209213/6	Lab Control Sample Dup	Total/NA	Solid	8015D	

Analysis Batch: 210543

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67974-4	UDEX-CD-09A-19-20211221	Total/NA	Solid	8015D	208757
410-67974-5	UDEX-CD-09A-20-20211221	Total/NA	Solid	8015D	208757
410-67974-6	UDEX-CD-09A-21-20211221	Total/NA	Solid	8015D	208757
MB 410-210543/4	Method Blank	Total/NA	Solid	8015D	
LCS 410-210543/5	Lab Control Sample	Total/NA	Solid	8015D	
LCSD 410-210543/6	Lab Control Sample Dup	Total/NA	Solid	8015D	

GC Semi VOA

Prep Batch: 211245

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67974-1	UDEX-CD-02A-15-20211221	Total/NA	Solid	3546	
410-67974-2	UDEX-CD-02A-18-20211221	Total/NA	Solid	3546	
410-67974-3	UDEX-CD-02A-20-20211221	Total/NA	Solid	3546	
410-67974-4	UDEX-CD-09A-19-20211221	Total/NA	Solid	3546	
410-67974-5	UDEX-CD-09A-20-20211221	Total/NA	Solid	3546	
410-67974-6	UDEX-CD-09A-21-20211221	Total/NA	Solid	3546	
MB 410-211245/1-A	Method Blank	Total/NA	Solid	3546	
LCS 410-211245/2-A	Lab Control Sample	Total/NA	Solid	3546	

Analysis Batch: 211496

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67974-1	UDEX-CD-02A-15-20211221	Total/NA	Solid	8015D TPH	211245
410-67974-2	UDEX-CD-02A-18-20211221	Total/NA	Solid	8015D TPH	211245
410-67974-3	UDEX-CD-02A-20-20211221	Total/NA	Solid	8015D TPH	211245
MB 410-211245/1-A	Method Blank	Total/NA	Solid	8015D TPH	211245
LCS 410-211245/2-A	Lab Control Sample	Total/NA	Solid	8015D TPH	211245

Analysis Batch: 212317

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67974-4	UDEX-CD-09A-19-20211221	Total/NA	Solid	8015D TPH	211245
410-67974-5	UDEX-CD-09A-20-20211221	Total/NA	Solid	8015D TPH	211245
410-67974-6	UDEX-CD-09A-21-20211221	Total/NA	Solid	8015D TPH	211245

QC Association Summary

Client: Stantec Consulting Corp. Job ID: 410-67974-1
Project/Site: PES UDEX Release Confirmation Drilling

General Chemistry

Analysis Batch: 208908

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-67974-1	UDEX-CD-02A-15-20211221	Total/NA	Solid	Moisture	
410-67974-2	UDEX-CD-02A-18-20211221	Total/NA	Solid	Moisture	
410-67974-3	UDEX-CD-02A-20-20211221	Total/NA	Solid	Moisture	
410-67974-4	UDEX-CD-09A-19-20211221	Total/NA	Solid	Moisture	
410-67974-5	UDEX-CD-09A-20-20211221	Total/NA	Solid	Moisture	
410-67974-6	UDEX-CD-09A-21-20211221	Total/NA	Solid	Moisture	

Client Sample ID: UDEX-CD-02A-15-20211221 — **Lab Sample ID: 410-67974-1**
Date Collected: 12/21/21 13:15 — **Matrix: Solid**
Date Received: 12/22/21 18:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	208908	12/23/21 12:18	UGCW	ELLE

Client Sample ID: UDEX-CD-02A-15-20211221 — **Lab Sample ID: 410-67974-1**
Date Collected: 12/21/21 13:15 — **Matrix: Solid**
Date Received: 12/22/21 18:15 — **Percent Solids: 96.0**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			208757	12/22/21 20:25	D8NM	ELLE
Total/NA	Analysis	8015D		25	209213	12/29/21 01:15	JJT8	ELLE
Total/NA	Prep	3546			211245	01/03/22 17:17	QQ3P	ELLE
Total/NA	Analysis	8015D TPH		1	211496	01/04/22 19:50	KP5X	ELLE

Client Sample ID: UDEX-CD-02A-18-20211221 — **Lab Sample ID: 410-67974-2**
Date Collected: 12/21/21 13:20 — **Matrix: Solid**
Date Received: 12/22/21 18:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	208908	12/23/21 12:18	UGCW	ELLE

Client Sample ID: UDEX-CD-02A-18-20211221 — **Lab Sample ID: 410-67974-2**
Date Collected: 12/21/21 13:20 — **Matrix: Solid**
Date Received: 12/22/21 18:15 — **Percent Solids: 93.9**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			208757	12/22/21 20:25	D8NM	ELLE
Total/NA	Analysis	8015D		10000	209213	12/29/21 01:52	JJT8	ELLE
Total/NA	Prep	3546			211245	01/03/22 17:17	QQ3P	ELLE
Total/NA	Analysis	8015D TPH		1	211496	01/04/22 20:12	KP5X	ELLE

Client Sample ID: UDEX-CD-02A-20-20211221 — **Lab Sample ID: 410-67974-3**
Date Collected: 12/21/21 13:25 — **Matrix: Solid**
Date Received: 12/22/21 18:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	208908	12/23/21 12:18	UGCW	ELLE

Client Sample ID: UDEX-CD-02A-20-20211221 — **Lab Sample ID: 410-67974-3**
Date Collected: 12/21/21 13:25 — **Matrix: Solid**
Date Received: 12/22/21 18:15 — **Percent Solids: 89.1**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			208757	12/22/21 20:25	D8NM	ELLE
Total/NA	Analysis	8015D		10000	209213	12/29/21 02:28	JJT8	ELLE
Total/NA	Prep	3546			211245	01/03/22 17:17	QQ3P	ELLE
Total/NA	Analysis	8015D TPH		1	211496	01/04/22 20:33	KP5X	ELLE

Lab Chronicle

Client: Stantec Consulting Corp. Job ID: 410-67974-1
Project/Site: PES UDEX Release Confirmation Drilling

Client Sample ID: UDEX-CD-09A-19-20211221 Lab Sample ID: 410-67974-4

Date Collected: 12/21/21 14:50 **Matrix: Solid**
Date Received: 12/22/21 18:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	208908	12/23/21 12:18	UGCW	ELLE

Client Sample ID: UDEX-CD-09A-19-20211221 Lab Sample ID: 410-67974-4

Date Collected: 12/21/21 14:50 **Matrix: Solid**
Date Received: 12/22/21 18:15 **Percent Solids: 89.3**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			208757	12/22/21 20:25	D8NM	ELLE
Total/NA	Analysis	8015D		50000	210543	12/30/21 20:13	JJT8	ELLE
Total/NA	Prep	3546			211245	01/03/22 17:17	QQ3P	ELLE
Total/NA	Analysis	8015D TPH		10	212317	01/06/22 15:47	UHEW	ELLE

Client Sample ID: UDEX-CD-09A-20-20211221 Lab Sample ID: 410-67974-5

Date Collected: 12/21/21 15:00 **Matrix: Solid**
Date Received: 12/22/21 18:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	208908	12/23/21 12:18	UGCW	ELLE

Client Sample ID: UDEX-CD-09A-20-20211221 Lab Sample ID: 410-67974-5

Date Collected: 12/21/21 15:00 **Matrix: Solid**
Date Received: 12/22/21 18:15 **Percent Solids: 88.3**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			208757	12/22/21 20:25	D8NM	ELLE
Total/NA	Analysis	8015D		50000	210543	12/30/21 20:49	JJT8	ELLE
Total/NA	Prep	3546			211245	01/03/22 17:17	QQ3P	ELLE
Total/NA	Analysis	8015D TPH		10	212317	01/06/22 16:08	UHEW	ELLE

Client Sample ID: UDEX-CD-09A-21-20211221 Lab Sample ID: 410-67974-6

Date Collected: 12/21/21 15:05 **Matrix: Solid**
Date Received: 12/22/21 18:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	208908	12/23/21 12:18	UGCW	ELLE

Client Sample ID: UDEX-CD-09A-21-20211221 Lab Sample ID: 410-67974-6

Date Collected: 12/21/21 15:05 **Matrix: Solid**
Date Received: 12/22/21 18:15 **Percent Solids: 85.3**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			208757	12/22/21 20:25	D8NM	ELLE
Total/NA	Analysis	8015D		10000	210543	12/30/21 18:18	JJT8	ELLE
Total/NA	Prep	3546			211245	01/03/22 17:17	QQ3P	ELLE
Total/NA	Analysis	8015D TPH		25	212317	01/06/22 16:30	UHEW	ELLE

Lab Chronicle

Client: Stantec Consulting Corp.
Job ID: 410-67974-1
Project/Site: PES UDEX Release Confirmation Drilling

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Stantec Consulting Corp. Job ID: 410-67974-1
Project/Site: PES UDEX Release Confirmation Drilling

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Pennsylvania	NELAP	36-00037	01-31-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture

Method Summary

Client: Stantec Consulting Corp.
Job ID: 410-67974-1
Project/Site: PES UDEX Release Confirmation Drilling

Method	Method Description	Protocol	Laboratory
8015D	Gasoline Range Organics (GRO) (GC)	SW846	ELLE
8015D TPH	Diesel Range Organics (DRO) (GC)	SW846	ELLE
Moisture	Percent Moisture	EPA	ELLE
3546	Microwave Extraction	SW846	ELLE
5035	Closed System Purge and Trap	SW846	ELLE

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: Stantec Consulting Corp.
Job ID: 410-67974-1
Project/Site: PES UDEX Release Confirmation Drilling

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-67974-1	UDEX-CD-02A-15-20211221	Solid	12/21/21 13:15	12/22/21 18:15
410-67974-2	UDEX-CD-02A-18-20211221	Solid	12/21/21 13:20	12/22/21 18:15
410-67974-3	UDEX-CD-02A-20-20211221	Solid	12/21/21 13:25	12/22/21 18:15
410-67974-4	UDEX-CD-09A-19-20211221	Solid	12/21/21 14:50	12/22/21 18:15
410-67974-5	UDEX-CD-09A-20-20211221	Solid	12/21/21 15:00	12/22/21 18:15
410-67974-6	UDEX-CD-09A-21-20211221	Solid	12/21/21 15:05	12/22/21 18:15

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Phone: 717-656-2300 Fax: 717-656-2681

Chain of Custody Record

410-67974 Chain of Custody

eurofins Environment Testing America

Client Information	Sampler: Dave Hopkins	Lab PM: Carter, Amek	COC No: 410-40669-12603.1
Client Contact: Andrew Klingbeil	Phone: 610-235-9200	E-Mail: Loran.Carter@eurofinset.com	Page: Page 1 of 3
Company: Stantec Consulting Corp	PWSID:		Job #:
Address: 1060 Andrew Drive Suite 140	Due Date Requested:		
City: West Chester	TAT Requested (days): Standard		
State, Zip: PA, 19380	Compliance Project: Δ Yes Δ No		
Phone: 610-840-2541(Tel)	PO #: 213403039		
Email: andrew.klingbeil@stantec.com	WO #:		
Project Name: PES UDEX Release Confirmation Drilling	Project #: 41003563		
Site: Former PAHL Refinery	SSOW#:		

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS (Yes or No)	TPH-GRO 8015	TPH-Custom Ranges 8015	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
UDEX-CD-02A-15-20211221	12/21/21	1315	G	S			X	X		
UDEX-CD-02A-18-20211221	12/21/21	1320	G	S			X	X		
UDEX-CD-02A-20-20211221	12/21/21	1325	G	S			X	X		
UDEX-CD-09A-19-20211221	12/21/21	1450	G	S			X	X		
UDEX-CD-09A-20-20211221	12/21/21	1500	G	S			X	X		
UDEX-CD-09A-21-20211221	12/21/21	1505	G	S			X	X		

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by		Date:		Time:		Method of Shipment:	
Relinquished by: Dave Hopkins	Date/Time: 12/22/21	18:15	Company: Stantec	Received by:	Date/Time:		Company:
Relinquished by:	Date/Time:		Company:	Received by:	Date/Time:		Company:
Relinquished by:	Date/Time:		Company:	Received by:	Date/Time: 12/22/21	18:15	Company:
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:			Cooler Temperature(s) °C and Other Remarks: 2.7°C			

Ver: 06/08/2021

Login Sample Receipt Checklist

Client: Stantec Consulting Corp.

Job Number: 410-67974-1

Login Number: 67974

List Source: Eurofins Lancaster Laboratories Env, LLC

List Number: 1

Creator: Knoedler, Christine M

Question	Answer	Comment
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	N/A	

ANALYTICAL REPORT

Lab Number:	L2337688
Client:	Stantec, Inc. 1060 Andrew Drive Suite 140 West Chester, PA 19380
ATTN:	Andrew Klingbeil
Phone:	(610) 840-2525
Project Name:	UDEX SONIC DRILLING
Project Number:	213403364
Report Date:	11/06/23

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: UDEX SONIC DRILLING
Project Number: 213403364

Lab Number: L2337688
Report Date: 11/06/23

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2337688-01	UDEX-CD-06-10.5-20230627	SOIL	3144 PASSYUNK AVE. PA PHILADELPHIA	06/27/23 12:00	06/30/23
L2337688-02	UDEX-CD-12D-14.8-20230628	SOIL	3144 PASSYUNK AVE. PA PHILADELPHIA	06/28/23 14:30	06/30/23
L2337688-03	UDEX-CD-02A-16-20230629	SOIL	3144 PASSYUNK AVE. PA PHILADELPHIA	06/29/23 13:40	06/30/23

Project Name:	UDEX SONIC DRILLING	**Lab Number:**	L2337688
Project Number:	213403364	**Report Date:**	11/06/23

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	UDEX SONIC DRILLING	**Lab Number:**	L2337688
Project Number:	213403364	**Report Date:**	11/06/23

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Sample Receipt

L2337688-02 and -03: The Client ID was specified by the client.

L2337688-02: The water-preserved VOA vials for Volatile Organics Low-Level analysis were received at the laboratory beyond the 48 hour holding time required for freezing. The results of the analysis are reported.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Melissa Sturgis Melissa Sturgis

Title: Technical Director/Representative Date: 11/06/23

ORGANICS

VOLATILES

Project Name: UDEX SONIC DRILLING **Lab Number:** L2337688

Project Number: 213403364 **Report Date:** 11/06/23

SAMPLE RESULTS

Lab ID: L2337688-01 D2 Date Collected: 06/27/23 12:00
Client ID: UDEX-CD-06-10.5-20230627 Date Received: 06/30/23
Sample Location: 3144 PASSYUNK AVE. PA PHILADELPHIA Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8260D
Analytical Date: 07/10/23 10:41
Analyst: JIC
Percent Solids: 91%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by EPA 5035 High - Westborough Lab						
Dichlorodifluoromethane	ND		mg/kg	2.2	0.20	5
Chloromethane	ND		mg/kg	0.86	0.20	5
Vinyl chloride	ND		mg/kg	0.22	0.072	5
Bromomethane	ND		mg/kg	0.43	0.12	5
Chloroethane	ND		mg/kg	0.43	0.097	5
Trichlorofluoromethane	ND		mg/kg	0.86	0.15	5
1,1-Dichloroethene	ND		mg/kg	0.22	0.051	5
Carbon disulfide	ND		mg/kg	2.2	0.98	5
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		mg/kg	0.86	0.15	5
Methylene chloride	ND		mg/kg	1.1	0.49	5
Acetone	ND		mg/kg	2.2	1.0	5
trans-1,2-Dichloroethene	ND		mg/kg	0.32	0.030	5
Methyl Acetate	ND		mg/kg	0.86	0.20	5
Methyl tert butyl ether	ND		mg/kg	0.43	0.043	5
1,1-Dichloroethane	ND		mg/kg	0.22	0.031	5
cis-1,2-Dichloroethene	ND		mg/kg	0.22	0.038	5
1,2-Dichloroethene, Total	ND		mg/kg	0.22	0.030	5
Cyclohexane	2.4		mg/kg	2.2	0.12	5
Bromochloromethane	ND		mg/kg	0.43	0.044	5
Chloroform	ND		mg/kg	0.32	0.030	5
Carbon tetrachloride	ND		mg/kg	0.22	0.050	5
1,1,1-Trichloroethane	ND		mg/kg	0.11	0.036	5
2-Butanone	ND		mg/kg	2.2	0.48	5
Benzene	65.	E	mg/kg	0.11	0.036	5
1,2-Dichloroethane	ND		mg/kg	0.22	0.055	5
Methyl cyclohexane	4.7		mg/kg	0.86	0.13	5
Trichloroethene	ND		mg/kg	0.11	0.030	5
1,2-Dichloropropane	ND		mg/kg	0.22	0.027	5

Project Name: UDEX SONIC DRILLING **Lab Number:** L2337688

Project Number: 213403364 **Report Date:** 11/06/23

SAMPLE RESULTS

Lab ID: L2337688-01 D2 Date Collected: 06/27/23 12:00

Client ID: UDEX-CD-06-10.5-20230627 Date Received: 06/30/23

Sample Location: 3144 PASSYUNK AVE. PA PHILADELPHIA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by EPA 5035 High - Westborough Lab						
Bromodichloromethane	ND		mg/kg	0.11	0.023	5
1,4-Dioxane	ND		mg/kg	17	7.6	5
cis-1,3-Dichloropropene	ND		mg/kg	0.11	0.034	5
Toluene	96.	E	mg/kg	0.22	0.12	5
4-Methyl-2-pentanone	ND		mg/kg	2.2	0.28	5
Tetrachloroethene	ND		mg/kg	0.11	0.042	5
trans-1,3-Dichloropropene	ND		mg/kg	0.22	0.059	5
1,3-Dichloropropene, Total	ND		mg/kg	0.11	0.034	5
1,1,2-Trichloroethane	ND		mg/kg	0.22	0.058	5
Dibromochloromethane	ND		mg/kg	0.22	0.030	5
1,2-Dibromoethane	ND		mg/kg	0.11	0.063	5
2-Hexanone	ND		mg/kg	2.2	0.25	5
Chlorobenzene	ND		mg/kg	0.11	0.027	5
Ethylbenzene	0.40		mg/kg	0.22	0.030	5
p/m-Xylene	1.1		mg/kg	0.43	0.12	5
o-Xylene	0.20	J	mg/kg	0.22	0.063	5
Xylenes, Total	1.3	J	mg/kg	0.22	0.063	5
Styrene	ND		mg/kg	0.22	0.042	5
Bromoform	ND		mg/kg	0.86	0.053	5
Isopropylbenzene	ND		mg/kg	0.22	0.023	5
1,1,2,2-Tetrachloroethane	ND		mg/kg	0.11	0.036	5
1,3-Dichlorobenzene	ND		mg/kg	0.43	0.032	5
1,4-Dichlorobenzene	ND		mg/kg	0.43	0.037	5
1,2-Dichlorobenzene	ND		mg/kg	0.43	0.031	5
1,2-Dibromo-3-chloropropane	ND		mg/kg	0.65	0.22	5
1,2,4-Trichlorobenzene	ND		mg/kg	0.43	0.059	5
1,2,3-Trichlorobenzene	ND		mg/kg	0.43	0.069	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	103		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	104		70-130
Dibromofluoromethane	95		70-130

Project Name: UDEX SONIC DRILLING
Lab Number: L2337688
Project Number: 213403364
Report Date: 11/06/23

SAMPLE RESULTS

Lab ID: L2337688-01 D
Client ID: UDEX-CD-06-10.5-20230627
Sample Location: 3144 PASSYUNK AVE. PA PHILADELPHIA

Date Collected: 06/27/23 12:00
Date Received: 06/30/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8260D
Analytical Date: 07/08/23 19:56
Analyst: JIC
Percent Solids: 91%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by EPA 5035 High - Westborough Lab						
Benzene	73.		mg/kg	2.2	0.72	100
Toluene	110		mg/kg	4.3	2.3	100

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	109		70-130
Toluene-d8	100		70-130
4-Bromofluorobenzene	104		70-130
Dibromofluoromethane	96		70-130

Project Name: UDEX SONIC DRILLING **Lab Number:** L2337688

Project Number: 213403364 **Report Date:** 11/06/23

SAMPLE RESULTS

Lab ID: L2337688-02
Client ID: UDEX-CD-12D-14.8-20230628
Sample Location: 3144 PASSYUNK AVE. PA PHILADELPHIA

Date Collected: 06/28/23 14:30
Date Received: 06/30/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8260D
Analytical Date: 07/08/23 20:17
Analyst: JIC
Percent Solids: 92%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by EPA 5035 Low - Westborough Lab						
Dichlorodifluoromethane	ND		mg/kg	0.0084	0.00077	1
Chloromethane	ND		mg/kg	0.0034	0.00079	1
Vinyl chloride	ND		mg/kg	0.00084	0.00028	1
Bromomethane	ND		mg/kg	0.0017	0.00049	1
Chloroethane	ND		mg/kg	0.0017	0.00038	1
Trichlorofluoromethane	ND		mg/kg	0.0034	0.00059	1
1,1-Dichloroethene	ND		mg/kg	0.00084	0.00020	1
Carbon disulfide	ND		mg/kg	0.0084	0.0038	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		mg/kg	0.0034	0.00058	1
Methylene chloride	ND		mg/kg	0.0042	0.0019	1
Acetone	0.029		mg/kg	0.021	0.0084	1
trans-1,2-Dichloroethene	ND		mg/kg	0.0013	0.00012	1
Methyl Acetate	ND		mg/kg	0.0034	0.00080	1
Methyl tert butyl ether	ND		mg/kg	0.0017	0.00017	1
1,1-Dichloroethane	ND		mg/kg	0.00084	0.00012	1
cis-1,2-Dichloroethene	ND		mg/kg	0.00084	0.00015	1
1,2-Dichloroethene, Total	ND		mg/kg	0.00084	0.00012	1
Cyclohexane	ND		mg/kg	0.0084	0.00046	1
Bromochloromethane	ND		mg/kg	0.0017	0.00017	1
Chloroform	ND		mg/kg	0.0013	0.00012	1
Carbon tetrachloride	ND		mg/kg	0.00084	0.00019	1
1,1,1-Trichloroethane	ND		mg/kg	0.00042	0.00014	1
2-Butanone	0.0034	J	mg/kg	0.0084	0.0019	1
Benzene	0.0021		mg/kg	0.00042	0.00014	1
1,2-Dichloroethane	ND		mg/kg	0.00084	0.00022	1
Methyl cyclohexane	ND		mg/kg	0.0034	0.00051	1
Trichloroethene	ND		mg/kg	0.00042	0.00012	1
1,2-Dichloropropane	ND		mg/kg	0.00084	0.00010	1

Project Name: UDEX SONIC DRILLING **Lab Number:** L2337688

Project Number: 213403364 **Report Date:** 11/06/23

SAMPLE RESULTS

Lab ID: L2337688-02 Date Collected: 06/28/23 14:30

Client ID: UDEX-CD-12D-14.8-20230628 Date Received: 06/30/23

Sample Location: 3144 PASSYUNK AVE. PA PHILADELPHIA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by EPA 5035 Low - Westborough Lab						
Bromodichloromethane	ND		mg/kg	0.00042	0.00009	1
1,4-Dioxane	ND		mg/kg	0.068	0.030	1
cis-1,3-Dichloropropene	ND		mg/kg	0.00042	0.00013	1
Toluene	0.0019		mg/kg	0.00084	0.00046	1
4-Methyl-2-pentanone	ND		mg/kg	0.0084	0.0011	1
Tetrachloroethene	ND		mg/kg	0.00042	0.00016	1
trans-1,3-Dichloropropene	ND		mg/kg	0.00084	0.00023	1
1,3-Dichloropropene, Total	ND		mg/kg	0.00042	0.00013	1
1,1,2-Trichloroethane	ND		mg/kg	0.00084	0.00022	1
Dibromochloromethane	ND		mg/kg	0.00084	0.00012	1
1,2-Dibromoethane	ND		mg/kg	0.00042	0.00025	1
2-Hexanone	ND		mg/kg	0.0084	0.0010	1
Chlorobenzene	ND		mg/kg	0.00042	0.00011	1
Ethylbenzene	ND		mg/kg	0.00084	0.00012	1
p/m-Xylene	ND		mg/kg	0.0017	0.00047	1
o-Xylene	ND		mg/kg	0.00084	0.00024	1
Xylenes, Total	ND		mg/kg	0.00084	0.00024	1
Styrene	ND		mg/kg	0.00084	0.00016	1
Bromoform	ND		mg/kg	0.0034	0.00021	1
Isopropylbenzene	ND		mg/kg	0.00084	0.00009	1
1,1,2,2-Tetrachloroethane	ND		mg/kg	0.00042	0.00014	1
1,3-Dichlorobenzene	ND		mg/kg	0.0017	0.00012	1
1,4-Dichlorobenzene	ND		mg/kg	0.0017	0.00014	1
1,2-Dichlorobenzene	ND		mg/kg	0.0017	0.00012	1
1,2-Dibromo-3-chloropropane	ND		mg/kg	0.0025	0.00084	1
1,2,4-Trichlorobenzene	ND		mg/kg	0.0017	0.00023	1
1,2,3-Trichlorobenzene	ND		mg/kg	0.0017	0.00027	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	112		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	105		70-130
Dibromofluoromethane	101		70-130

Project Name: UDEX SONIC DRILLING **Lab Number:** L2337688

Project Number: 213403364 **Report Date:** 11/06/23

SAMPLE RESULTS

Lab ID: L2337688-03 Date Collected: 06/29/23 13:40
Client ID: UDEX-CD-02A-16-20230629 Date Received: 06/30/23
Sample Location: 3144 PASSYUNK AVE. PA PHILADELPHIA Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8260D
Analytical Date: 07/08/23 20:38
Analyst: JIC
Percent Solids: 95%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by EPA 5035 Low - Westborough Lab						
Dichlorodifluoromethane	ND		mg/kg	0.010	0.00093	1
Chloromethane	ND		mg/kg	0.0041	0.00095	1
Vinyl chloride	ND		mg/kg	0.0010	0.00034	1
Bromomethane	ND		mg/kg	0.0020	0.00059	1
Chloroethane	ND		mg/kg	0.0020	0.00046	1
Trichlorofluoromethane	ND		mg/kg	0.0041	0.00071	1
1,1-Dichloroethene	ND		mg/kg	0.0010	0.00024	1
Carbon disulfide	ND		mg/kg	0.010	0.0046	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		mg/kg	0.0041	0.00071	1
Methylene chloride	ND		mg/kg	0.0051	0.0023	1
Acetone	0.010	J	mg/kg	0.026	0.010	1
trans-1,2-Dichloroethene	ND		mg/kg	0.0015	0.00014	1
Methyl Acetate	ND		mg/kg	0.0041	0.00097	1
Methyl tert butyl ether	ND		mg/kg	0.0020	0.00020	1
1,1-Dichloroethane	ND		mg/kg	0.0010	0.00015	1
cis-1,2-Dichloroethene	ND		mg/kg	0.0010	0.00018	1
1,2-Dichloroethene, Total	ND		mg/kg	0.0010	0.00014	1
Cyclohexane	ND		mg/kg	0.010	0.00056	1
Bromochloromethane	ND		mg/kg	0.0020	0.00021	1
Chloroform	ND		mg/kg	0.0015	0.00014	1
Carbon tetrachloride	ND		mg/kg	0.0010	0.00023	1
1,1,1-Trichloroethane	ND		mg/kg	0.00051	0.00017	1
2-Butanone	ND		mg/kg	0.010	0.0023	1
Benzene	0.011		mg/kg	0.00051	0.00017	1
1,2-Dichloroethane	ND		mg/kg	0.0010	0.00026	1
Methyl cyclohexane	ND		mg/kg	0.0041	0.00062	1
Trichloroethene	ND		mg/kg	0.00051	0.00014	1
1,2-Dichloropropane	ND		mg/kg	0.0010	0.00013	1

Project Name: UDEX SONIC DRILLING **Lab Number:** L2337688

Project Number: 213403364 **Report Date:** 11/06/23

SAMPLE RESULTS

Lab ID: L2337688-03 Date Collected: 06/29/23 13:40

Client ID: UDEX-CD-02A-16-20230629 Date Received: 06/30/23

Sample Location: 3144 PASSYUNK AVE. PA PHILADELPHIA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by EPA 5035 Low - Westborough Lab						
Bromodichloromethane	ND		mg/kg	0.00051	0.00011	1
1,4-Dioxane	ND		mg/kg	0.082	0.036	1
cis-1,3-Dichloropropene	ND		mg/kg	0.00051	0.00016	1
Toluene	0.0039		mg/kg	0.0010	0.00055	1
4-Methyl-2-pentanone	ND		mg/kg	0.010	0.0013	1
Tetrachloroethene	ND		mg/kg	0.00051	0.00020	1
trans-1,3-Dichloropropene	ND		mg/kg	0.0010	0.00028	1
1,3-Dichloropropene, Total	ND		mg/kg	0.00051	0.00016	1
1,1,2-Trichloroethane	ND		mg/kg	0.0010	0.00027	1
Dibromochloromethane	ND		mg/kg	0.0010	0.00014	1
1,2-Dibromoethane	ND		mg/kg	0.00051	0.00030	1
2-Hexanone	ND		mg/kg	0.010	0.0012	1
Chlorobenzene	ND		mg/kg	0.00051	0.00013	1
Ethylbenzene	ND		mg/kg	0.0010	0.00014	1
p/m-Xylene	ND		mg/kg	0.0020	0.00057	1
o-Xylene	ND		mg/kg	0.0010	0.00030	1
Xylenes, Total	ND		mg/kg	0.0010	0.00030	1
Styrene	ND		mg/kg	0.0010	0.00020	1
Bromoform	ND		mg/kg	0.0041	0.00025	1
Isopropylbenzene	ND		mg/kg	0.0010	0.00011	1
1,1,2,2-Tetrachloroethane	ND		mg/kg	0.00051	0.00017	1
1,3-Dichlorobenzene	ND		mg/kg	0.0020	0.00015	1
1,4-Dichlorobenzene	ND		mg/kg	0.0020	0.00017	1
1,2-Dichlorobenzene	ND		mg/kg	0.0020	0.00015	1
1,2-Dibromo-3-chloropropane	ND		mg/kg	0.0031	0.0010	1
1,2,4-Trichlorobenzene	ND		mg/kg	0.0020	0.00028	1
1,2,3-Trichlorobenzene	ND		mg/kg	0.0020	0.00033	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	109		70-130
Toluene-d8	100		70-130
4-Bromofluorobenzene	102		70-130
Dibromofluoromethane	98		70-130

Project Name: UDEX SONIC DRILLING **Lab Number:** L2337688

Project Number: 213403364 **Report Date:** 11/06/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/08/23 13:34
Analyst: LAC

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by EPA 5035 High - Westborough Lab for sample(s): 01 Batch: WG1801347-5					
Dichlorodifluoromethane	ND		mg/kg	0.50	0.046
Chloromethane	ND		mg/kg	0.20	0.047
Vinyl chloride	ND		mg/kg	0.050	0.017
Bromomethane	ND		mg/kg	0.10	0.029
Chloroethane	ND		mg/kg	0.10	0.023
Trichlorofluoromethane	ND		mg/kg	0.20	0.035
1,1-Dichloroethene	ND		mg/kg	0.050	0.012
Carbon disulfide	ND		mg/kg	0.50	0.23
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		mg/kg	0.20	0.035
Methylene chloride	ND		mg/kg	0.25	0.11
Acetone	0.39	J	mg/kg	0.50	0.24
trans-1,2-Dichloroethene	ND		mg/kg	0.075	0.0068
Methyl Acetate	ND		mg/kg	0.20	0.048
Methyl tert butyl ether	ND		mg/kg	0.10	0.010
1,1-Dichloroethane	ND		mg/kg	0.050	0.0072
cis-1,2-Dichloroethene	ND		mg/kg	0.050	0.0088
1,2-Dichloroethene, Total	ND		mg/kg	0.050	0.0068
Cyclohexane	ND		mg/kg	0.50	0.027
Bromochloromethane	ND		mg/kg	0.10	0.010
Chloroform	ND		mg/kg	0.075	0.0070
Carbon tetrachloride	ND		mg/kg	0.050	0.012
1,1,1-Trichloroethane	ND		mg/kg	0.025	0.0084
2-Butanone	ND		mg/kg	0.50	0.11
Benzene	ND		mg/kg	0.025	0.0083
1,2-Dichloroethane	ND		mg/kg	0.050	0.013
Methyl cyclohexane	ND		mg/kg	0.20	0.030
Trichloroethene	ND		mg/kg	0.025	0.0068
1,2-Dichloropropane	ND		mg/kg	0.050	0.0062
Bromodichloromethane	ND		mg/kg	0.025	0.0054

Project Name: UDEX SONIC DRILLING **Lab Number:** L2337688

Project Number: 213403364 **Report Date:** 11/06/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/08/23 13:34
Analyst: LAC

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by EPA 5035 High - Westborough Lab for sample(s): 01 Batch: WG1801347-5					
1,4-Dioxane	ND		mg/kg	4.0	1.8
cis-1,3-Dichloropropene	ND		mg/kg	0.025	0.0079
Toluene	ND		mg/kg	0.050	0.027
4-Methyl-2-pentanone	ND		mg/kg	0.50	0.064
Tetrachloroethene	ND		mg/kg	0.025	0.0098
trans-1,3-Dichloropropene	ND		mg/kg	0.050	0.014
1,3-Dichloropropene, Total	ND		mg/kg	0.025	0.0079
1,1,2-Trichloroethane	ND		mg/kg	0.050	0.013
Dibromochloromethane	ND		mg/kg	0.050	0.0070
1,2-Dibromoethane	ND		mg/kg	0.025	0.015
2-Hexanone	ND		mg/kg	0.50	0.059
Chlorobenzene	ND		mg/kg	0.025	0.0064
Ethylbenzene	ND		mg/kg	0.050	0.0070
p/m-Xylene	ND		mg/kg	0.10	0.028
o-Xylene	ND		mg/kg	0.050	0.014
Xylenes, Total	ND		mg/kg	0.050	0.014
Styrene	ND		mg/kg	0.050	0.0098
Bromoform	ND		mg/kg	0.20	0.012
Isopropylbenzene	ND		mg/kg	0.050	0.0054
1,1,2,2-Tetrachloroethane	ND		mg/kg	0.025	0.0083
1,3-Dichlorobenzene	ND		mg/kg	0.10	0.0074
1,4-Dichlorobenzene	ND		mg/kg	0.10	0.0086
1,2-Dichlorobenzene	ND		mg/kg	0.10	0.0072
1,2-Dibromo-3-chloropropane	ND		mg/kg	0.15	0.050
1,2,4-Trichlorobenzene	ND		mg/kg	0.10	0.014
1,2,3-Trichlorobenzene	ND		mg/kg	0.10	0.016

Project Name: UDEX SONIC DRILLING **Lab Number:** L2337688

Project Number: 213403364 **Report Date:** 11/06/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/08/23 13:34
Analyst: LAC

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by EPA 5035 High - Westborough Lab for sample(s): 01 Batch: WG1801347-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	105		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	103		70-130
Dibromofluoromethane	94		70-130

Project Name: UDEX SONIC DRILLING **Lab Number:** L2337688

Project Number: 213403364 **Report Date:** 11/06/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/08/23 13:34
Analyst: LAC

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 02-03 Batch: WG1801348-5					
Dichlorodifluoromethane	ND		mg/kg	0.010	0.00092
Chloromethane	ND		mg/kg	0.0040	0.00093
Vinyl chloride	ND		mg/kg	0.0010	0.00034
Bromomethane	ND		mg/kg	0.0020	0.00058
Chloroethane	ND		mg/kg	0.0020	0.00045
Trichlorofluoromethane	ND		mg/kg	0.0040	0.00070
1,1-Dichloroethene	ND		mg/kg	0.0010	0.00024
Carbon disulfide	ND		mg/kg	0.010	0.0046
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		mg/kg	0.0040	0.00069
Methylene chloride	ND		mg/kg	0.0050	0.0023
Acetone	ND		mg/kg	0.025	0.010
trans-1,2-Dichloroethene	ND		mg/kg	0.0015	0.00014
Methyl Acetate	ND		mg/kg	0.0040	0.00095
Methyl tert butyl ether	ND		mg/kg	0.0020	0.00020
1,1-Dichloroethane	ND		mg/kg	0.0010	0.00014
cis-1,2-Dichloroethene	ND		mg/kg	0.0010	0.00018
1,2-Dichloroethene, Total	ND		mg/kg	0.0010	0.00014
Cyclohexane	ND		mg/kg	0.010	0.00054
Bromochloromethane	ND		mg/kg	0.0020	0.00020
Chloroform	ND		mg/kg	0.0015	0.00014
Carbon tetrachloride	ND		mg/kg	0.0010	0.00023
1,1,1-Trichloroethane	ND		mg/kg	0.00050	0.00017
2-Butanone	ND		mg/kg	0.010	0.0022
Benzene	ND		mg/kg	0.00050	0.00017
1,2-Dichloroethane	ND		mg/kg	0.0010	0.00026
Methyl cyclohexane	ND		mg/kg	0.0040	0.00060
Trichloroethene	ND		mg/kg	0.00050	0.00014
1,2-Dichloropropane	ND		mg/kg	0.0010	0.00012
Bromodichloromethane	ND		mg/kg	0.00050	0.00011

Project Name: UDEX SONIC DRILLING **Lab Number:** L2337688

Project Number: 213403364 **Report Date:** 11/06/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/08/23 13:34
Analyst: LAC

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 02-03 Batch: WG1801348-5					
1,4-Dioxane	ND		mg/kg	0.080	0.035
cis-1,3-Dichloropropene	ND		mg/kg	0.00050	0.00016
Toluene	ND		mg/kg	0.0010	0.00054
4-Methyl-2-pentanone	ND		mg/kg	0.010	0.0013
Tetrachloroethene	ND		mg/kg	0.00050	0.00020
trans-1,3-Dichloropropene	ND		mg/kg	0.0010	0.00027
1,3-Dichloropropene, Total	ND		mg/kg	0.00050	0.00016
1,1,2-Trichloroethane	ND		mg/kg	0.0010	0.00027
Dibromochloromethane	ND		mg/kg	0.0010	0.00014
1,2-Dibromoethane	ND		mg/kg	0.00050	0.00029
2-Hexanone	ND		mg/kg	0.010	0.0012
Chlorobenzene	ND		mg/kg	0.00050	0.00013
Ethylbenzene	ND		mg/kg	0.0010	0.00014
p/m-Xylene	ND		mg/kg	0.0020	0.00056
o-Xylene	ND		mg/kg	0.0010	0.00029
Xylenes, Total	ND		mg/kg	0.0010	0.00029
Styrene	ND		mg/kg	0.0010	0.00020
Bromoform	ND		mg/kg	0.0040	0.00025
Isopropylbenzene	ND		mg/kg	0.0010	0.00011
1,1,2,2-Tetrachloroethane	ND		mg/kg	0.00050	0.00017
1,3-Dichlorobenzene	ND		mg/kg	0.0020	0.00015
1,4-Dichlorobenzene	ND		mg/kg	0.0020	0.00017
1,2-Dichlorobenzene	ND		mg/kg	0.0020	0.00014
1,2-Dibromo-3-chloropropane	ND		mg/kg	0.0030	0.0010
1,2,4-Trichlorobenzene	ND		mg/kg	0.0020	0.00027
1,2,3-Trichlorobenzene	ND		mg/kg	0.0020	0.00032

Project Name: UDEX SONIC DRILLING
Project Number: 213403364
Lab Number: L2337688
Report Date: 11/06/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/08/23 13:34
Analyst: LAC

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 02-03 Batch: WG1801348-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	105		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	103		70-130
Dibromofluoromethane	94		70-130

Project Name: UDEX SONIC DRILLING **Lab Number:** L2337688

Project Number: 213403364 **Report Date:** 11/06/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/10/23 08:36
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by EPA 5035 High - Westborough Lab for sample(s): 01 Batch: WG1801873-5					
Dichlorodifluoromethane	ND		mg/kg	0.50	0.046
Chloromethane	ND		mg/kg	0.20	0.047
Vinyl chloride	ND		mg/kg	0.050	0.017
Bromomethane	ND		mg/kg	0.10	0.029
Chloroethane	ND		mg/kg	0.10	0.023
Trichlorofluoromethane	ND		mg/kg	0.20	0.035
1,1-Dichloroethene	ND		mg/kg	0.050	0.012
Carbon disulfide	ND		mg/kg	0.50	0.23
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		mg/kg	0.20	0.035
Methylene chloride	ND		mg/kg	0.25	0.11
Acetone	0.38	J	mg/kg	0.50	0.24
trans-1,2-Dichloroethene	ND		mg/kg	0.075	0.0068
Methyl Acetate	ND		mg/kg	0.20	0.048
Methyl tert butyl ether	ND		mg/kg	0.10	0.010
1,1-Dichloroethane	ND		mg/kg	0.050	0.0072
cis-1,2-Dichloroethene	ND		mg/kg	0.050	0.0088
1,2-Dichloroethene, Total	ND		mg/kg	0.050	0.0068
Cyclohexane	ND		mg/kg	0.50	0.027
Bromochloromethane	ND		mg/kg	0.10	0.010
Chloroform	ND		mg/kg	0.075	0.0070
Carbon tetrachloride	ND		mg/kg	0.050	0.012
1,1,1-Trichloroethane	ND		mg/kg	0.025	0.0084
2-Butanone	ND		mg/kg	0.50	0.11
Benzene	ND		mg/kg	0.025	0.0083
1,2-Dichloroethane	ND		mg/kg	0.050	0.013
Methyl cyclohexane	ND		mg/kg	0.20	0.030
Trichloroethene	ND		mg/kg	0.025	0.0068
1,2-Dichloropropane	ND		mg/kg	0.050	0.0062
Bromodichloromethane	ND		mg/kg	0.025	0.0054

Project Name: UDEX SONIC DRILLING **Lab Number:** L2337688

Project Number: 213403364 **Report Date:** 11/06/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/10/23 08:36
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by EPA 5035 High - Westborough Lab for sample(s): 01 Batch: WG1801873-5					
1,4-Dioxane	ND		mg/kg	4.0	1.8
cis-1,3-Dichloropropene	ND		mg/kg	0.025	0.0079
Toluene	ND		mg/kg	0.050	0.027
4-Methyl-2-pentanone	ND		mg/kg	0.50	0.064
Tetrachloroethene	ND		mg/kg	0.025	0.0098
trans-1,3-Dichloropropene	ND		mg/kg	0.050	0.014
1,3-Dichloropropene, Total	ND		mg/kg	0.025	0.0079
1,1,2-Trichloroethane	ND		mg/kg	0.050	0.013
Dibromochloromethane	ND		mg/kg	0.050	0.0070
1,2-Dibromoethane	ND		mg/kg	0.025	0.015
2-Hexanone	ND		mg/kg	0.50	0.059
Chlorobenzene	ND		mg/kg	0.025	0.0064
Ethylbenzene	ND		mg/kg	0.050	0.0070
p/m-Xylene	ND		mg/kg	0.10	0.028
o-Xylene	ND		mg/kg	0.050	0.014
Xylenes, Total	ND		mg/kg	0.050	0.014
Styrene	ND		mg/kg	0.050	0.0098
Bromoform	ND		mg/kg	0.20	0.012
Isopropylbenzene	ND		mg/kg	0.050	0.0054
1,1,2,2-Tetrachloroethane	ND		mg/kg	0.025	0.0083
1,3-Dichlorobenzene	ND		mg/kg	0.10	0.0074
1,4-Dichlorobenzene	ND		mg/kg	0.10	0.0086
1,2-Dichlorobenzene	ND		mg/kg	0.10	0.0072
1,2-Dibromo-3-chloropropane	ND		mg/kg	0.15	0.050
1,2,4-Trichlorobenzene	ND		mg/kg	0.10	0.014
1,2,3-Trichlorobenzene	ND		mg/kg	0.10	0.016

Project Name: UDEX SONIC DRILLING **Lab Number:** L2337688

Project Number: 213403364 **Report Date:** 11/06/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260D
Analytical Date: 07/10/23 08:36
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by EPA 5035 High - Westborough Lab for sample(s): 01 Batch: WG1801873-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	111		70-130
Toluene-d8	100		70-130
4-Bromofluorobenzene	102		70-130
Dibromofluoromethane	99		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: UDEX SONIC DRILLING

Project Number: 213403364

Lab Number: L2337688

Report Date: 11/06/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by EPA 5035 High - Westborough Lab Associated sample(s): 01 Batch: WG1801347-3 WG1801347-4								
Dichlorodifluoromethane	92		93		30-146	1		30
Chloromethane	76		77		52-130	1		30
Vinyl chloride	90		93		67-130	3		30
Bromomethane	111		113		57-147	2		30
Chloroethane	92		88		50-151	4		30
Trichlorofluoromethane	98		100		70-139	2		30
1,1-Dichloroethene	96		98		65-135	2		30
Carbon disulfide	91		91		59-130	0		30
1,1,2-Trichloro-1,2,2-Trifluoroethane	95		98		50-139	3		30
Methylene chloride	101		99		70-130	2		30
Acetone	128		126		54-140	2		30
trans-1,2-Dichloroethene	100		101		70-130	1		30
Methyl Acetate	106		111		51-146	5		30
Methyl tert butyl ether	120		112		66-130	7		30
1,1-Dichloroethane	105		103		70-130	2		30
cis-1,2-Dichloroethene	99		99		70-130	0		30
Cyclohexane	107		106		59-142	1		30
Bromochloromethane	91		89		70-130	2		30
Chloroform	104		101		70-130	3		30
Carbon tetrachloride	100		98		70-130	2		30
1,1,1-Trichloroethane	109		109		70-130	0		30
2-Butanone	77		79		70-130	3		30
Benzene	105		104		70-130	1		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: UDEX SONIC DRILLING
Project Number: 213403364
Lab Number: L2337688
Report Date: 11/06/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by EPA 5035 High - Westborough Lab Associated sample(s): 01 Batch: WG1801347-3 WG1801347-4								
1,2-Dichloroethane	102		98		70-130	4		30
Methyl cyclohexane	106		105		70-130	1		30
Trichloroethene	109		106		70-130	3		30
1,2-Dichloropropane	98		95		70-130	3		30
Bromodichloromethane	102		97		70-130	5		30
1,4-Dioxane	108		116		65-136	7		30
cis-1,3-Dichloropropene	98		94		70-130	4		30
Toluene	95		98		70-130	3		30
4-Methyl-2-pentanone	95		99		70-130	4		30
Tetrachloroethene	89		92		70-130	3		30
trans-1,3-Dichloropropene	93		92		70-130	1		30
1,1,2-Trichloroethane	97		96		70-130	1		30
Dibromochloromethane	88		88		70-130	0		30
1,2-Dibromoethane	95		96		70-130	1		30
2-Hexanone	81		86		70-130	6		30
Chlorobenzene	92		94		70-130	2		30
Ethylbenzene	100		102		70-130	2		30
p/m-Xylene	97		98		70-130	1		30
o-Xylene	95		97		70-130	2		30
Styrene	98		98		70-130	0		30
Bromoform	90		94		70-130	4		30
Isopropylbenzene	98		103		70-130	5		30
1,1,2,2-Tetrachloroethane	96		99		70-130	3		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: UDEX SONIC DRILLING

Project Number: 213403364

Lab Number: L2337688

Report Date: 11/06/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by EPA 5035 High - Westborough Lab Associated sample(s): 01 Batch: WG1801347-3 WG1801347-4								
1,3-Dichlorobenzene	89		92		70-130	3		30
1,4-Dichlorobenzene	88		90		70-130	2		30
1,2-Dichlorobenzene	89		91		70-130	2		30
1,2-Dibromo-3-chloropropane	83		93		68-130	11		30
1,2,4-Trichlorobenzene	95		94		70-130	1		30
1,2,3-Trichlorobenzene	96		96		70-130	0		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	104		98		70-130
Toluene-d8	101		101		70-130
4-Bromofluorobenzene	105		105		70-130
Dibromofluoromethane	99		95		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: UDEX SONIC DRILLING
Project Number: 213403364

Lab Number: L2337688
Report Date: 11/06/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 02-03 Batch: WG1801348-3 WG1801348-4								
Dichlorodifluoromethane	92		93		30-146	1		30
Chloromethane	76		77		52-130	1		30
Vinyl chloride	90		93		67-130	3		30
Bromomethane	111		113		57-147	2		30
Chloroethane	92		88		50-151	4		30
Trichlorofluoromethane	98		100		70-139	2		30
1,1-Dichloroethene	96		98		65-135	2		30
Carbon disulfide	91		91		59-130	0		30
1,1,2-Trichloro-1,2,2-Trifluoroethane	95		98		50-139	3		30
Methylene chloride	101		99		70-130	2		30
Acetone	128		126		54-140	2		30
trans-1,2-Dichloroethene	100		101		70-130	1		30
Methyl Acetate	106		111		51-146	5		30
Methyl tert butyl ether	120		112		66-130	7		30
1,1-Dichloroethane	105		103		70-130	2		30
cis-1,2-Dichloroethene	99		99		70-130	0		30
Cyclohexane	107		106		59-142	1		30
Bromochloromethane	91		89		70-130	2		30
Chloroform	104		101		70-130	3		30
Carbon tetrachloride	100		98		70-130	2		30
1,1,1-Trichloroethane	109		109		70-130	0		30
2-Butanone	77		79		70-130	3		30
Benzene	105		104		70-130	1		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: UDEX SONIC DRILLING
Project Number: 213403364
Lab Number: L2337688
Report Date: 11/06/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 02-03 Batch: WG1801348-3 WG1801348-4								
1,2-Dichloroethane	102		98		70-130	4		30
Methyl cyclohexane	106		105		70-130	1		30
Trichloroethene	109		106		70-130	3		30
1,2-Dichloropropane	98		95		70-130	3		30
Bromodichloromethane	102		97		70-130	5		30
1,4-Dioxane	108		116		65-136	7		30
cis-1,3-Dichloropropene	98		94		70-130	4		30
Toluene	95		98		70-130	3		30
4-Methyl-2-pentanone	95		99		70-130	4		30
Tetrachloroethene	89		92		70-130	3		30
trans-1,3-Dichloropropene	93		92		70-130	1		30
1,1,2-Trichloroethane	97		96		70-130	1		30
Dibromochloromethane	88		88		70-130	0		30
1,2-Dibromoethane	95		96		70-130	1		30
2-Hexanone	81		86		70-130	6		30
Chlorobenzene	92		94		70-130	2		30
Ethylbenzene	100		102		70-130	2		30
p/m-Xylene	97		98		70-130	1		30
o-Xylene	95		97		70-130	2		30
Styrene	98		98		70-130	0		30
Bromoform	90		94		70-130	4		30
Isopropylbenzene	98		103		70-130	5		30
1,1,2,2-Tetrachloroethane	96		99		70-130	3		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: UDEX SONIC DRILLING
Project Number: 213403364
Lab Number: L2337688
Report Date: 11/06/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 02-03 Batch: WG1801348-3 WG1801348-4								
1,3-Dichlorobenzene	89		92		70-130	3		30
1,4-Dichlorobenzene	88		90		70-130	2		30
1,2-Dichlorobenzene	89		91		70-130	2		30
1,2-Dibromo-3-chloropropane	83		93		68-130	11		30
1,2,4-Trichlorobenzene	95		94		70-130	1		30
1,2,3-Trichlorobenzene	96		96		70-130	0		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	104		98		70-130
Toluene-d8	101		101		70-130
4-Bromofluorobenzene	105		105		70-130
Dibromofluoromethane	99		95		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: UDEX SONIC DRILLING
Project Number: 213403364

Lab Number: L2337688
Report Date: 11/06/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by EPA 5035 High - Westborough Lab Associated sample(s): 01 Batch: WG1801873-3 WG1801873-4								
Dichlorodifluoromethane	80		72		30-146	11		30
Chloromethane	69		62		52-130	11		30
Vinyl chloride	82		75		67-130	9		30
Bromomethane	86		79		57-147	8		30
Chloroethane	83		77		50-151	8		30
Trichlorofluoromethane	89		82		70-139	8		30
1,1-Dichloroethene	88		81		65-135	8		30
Carbon disulfide	84		77		59-130	9		30
1,1,2-Trichloro-1,2,2-Trifluoroethane	88		79		50-139	11		30
Methylene chloride	91		87		70-130	4		30
Acetone	106		109		54-140	3		30
trans-1,2-Dichloroethene	88		88		70-130	0		30
Methyl Acetate	100		94		51-146	6		30
Methyl tert butyl ether	103		100		66-130	3		30
1,1-Dichloroethane	96		90		70-130	6		30
cis-1,2-Dichloroethene	92		84		70-130	9		30
Cyclohexane	96		86		59-142	11		30
Bromochloromethane	84		80		70-130	5		30
Chloroform	94		90		70-130	4		30
Carbon tetrachloride	89		83		70-130	7		30
1,1,1-Trichloroethane	99		94		70-130	5		30
2-Butanone	74		70		70-130	6		30
Benzene	97		90		70-130	7		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: UDEX SONIC DRILLING
Project Number: 213403364
Lab Number: L2337688
Report Date: 11/06/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by EPA 5035 High - Westborough Lab Associated sample(s): 01 Batch: WG1801873-3 WG1801873-4								
1,2-Dichloroethane	93		88		70-130	6		30
Methyl cyclohexane	92		84		70-130	9		30
Trichloroethene	96		95		70-130	1		30
1,2-Dichloropropane	89		84		70-130	6		30
Bromodichloromethane	91		85		70-130	7		30
1,4-Dioxane	92		96		65-136	4		30
cis-1,3-Dichloropropene	88		83		70-130	6		30
Toluene	89		85		70-130	5		30
4-Methyl-2-pentanone	87		84		70-130	4		30
Tetrachloroethene	85		78		70-130	9		30
trans-1,3-Dichloropropene	86		83		70-130	4		30
1,1,2-Trichloroethane	89		87		70-130	2		30
Dibromochloromethane	82		80		70-130	2		30
1,2-Dibromoethane	90		86		70-130	5		30
2-Hexanone	76		73		70-130	4		30
Chlorobenzene	86		82		70-130	5		30
Ethylbenzene	92		87		70-130	6		30
p/m-Xylene	90		86		70-130	5		30
o-Xylene	90		86		70-130	5		30
Styrene	92		88		70-130	4		30
Bromoform	85		82		70-130	4		30
Isopropylbenzene	91		86		70-130	6		30
1,1,2,2-Tetrachloroethane	89		82		70-130	8		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: UDEX SONIC DRILLING

Project Number: 213403364

Lab Number: L2337688

Report Date: 11/06/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by EPA 5035 High - Westborough Lab Associated sample(s): 01 Batch: WG1801873-3 WG1801873-4								
1,3-Dichlorobenzene	86		80		70-130	7		30
1,4-Dichlorobenzene	83		80		70-130	4		30
1,2-Dichlorobenzene	84		79		70-130	6		30
1,2-Dibromo-3-chloropropane	81		77		68-130	5		30
1,2,4-Trichlorobenzene	90		82		70-130	9		30
1,2,3-Trichlorobenzene	91		86		70-130	6		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	102		103		70-130
Toluene-d8	102		103		70-130
4-Bromofluorobenzene	105		105		70-130
Dibromofluoromethane	95		97		70-130

PETROLEUM HYDROCARBONS

Project Name: UDEX SONIC DRILLING
Lab Number: L2337688
Project Number: 213403364
Report Date: 11/06/23

SAMPLE RESULTS

Lab ID: L2337688-01
Client ID: UDEX-CD-06-10.5-20230627
Sample Location: 3144 PASSYUNK AVE. PA PHILADELPHIA
Date Collected: 06/27/23 12:00
Date Received: 06/30/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8015D(M)
Analytical Date: 07/03/23 23:23
Analyst: SC
Percent Solids: 91%

Extraction Method: EPA 3546
Extraction Date: 07/03/23 05:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	158.		mg/kg	35.8	3.59	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	88		40-140

Project Name: UDEX SONIC DRILLING
Lab Number: L2337688
Project Number: 213403364
Report Date: 11/06/23

SAMPLE RESULTS

Lab ID: L2337688-01 D
Client ID: UDEX-CD-06-10.5-20230627
Sample Location: 3144 PASSYUNK AVE. PA PHILADELPHIA

Date Collected: 06/27/23 12:00
Date Received: 06/30/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8015D(M)
Analytical Date: 07/06/23 19:10
Analyst: BAD
Percent Solids: 91%

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	520		mg/kg	38	0.74	20

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	114		70-130
4-Bromofluorobenzene	96		70-130

Project Name: UDEX SONIC DRILLING
Lab Number: L2337688
Project Number: 213403364
Report Date: 11/06/23

SAMPLE RESULTS

Lab ID: L2337688-02
Client ID: UDEX-CD-12D-14.8-20230628
Sample Location: 3144 PASSYUNK AVE. PA PHILADELPHIA
Date Collected: 06/28/23 14:30
Date Received: 06/30/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8015D(M)
Analytical Date: 07/03/23 22:13
Analyst: SC
Percent Solids: 92%

Extraction Method: EPA 3546
Extraction Date: 07/03/23 05:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	5.55	J	mg/kg	34.8	3.49	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	80		40-140

Project Name: UDEX SONIC DRILLING
Lab Number: L2337688
Project Number: 213403364
Report Date: 11/06/23

SAMPLE RESULTS

Lab ID: L2337688-02
Client ID: UDEX-CD-12D-14.8-20230628
Sample Location: 3144 PASSYUNK AVE. PA PHILADELPHIA

Date Collected: 06/28/23 14:30
Date Received: 06/30/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8015D(M)
Analytical Date: 07/06/23 19:40
Analyst: BAD
Percent Solids: 92%

Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	0.59	J	mg/kg	2.1	0.041	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	104		70-130
4-Bromofluorobenzene	93		70-130

Project Name: UDEX SONIC DRILLING
Lab Number: L2337688
Project Number: 213403364
Report Date: 11/06/23

SAMPLE RESULTS

Lab ID: L2337688-03
Client ID: UDEX-CD-02A-16-20230629
Sample Location: 3144 PASSYUNK AVE. PA PHILADELPHIA
Date Collected: 06/29/23 13:40
Date Received: 06/30/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8015D(M)
Analytical Date: 07/03/23 22:48
Analyst: SC
Percent Solids: 95%

Extraction Method: EPA 3546
Extraction Date: 07/03/23 05:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C9-C44)	7.15	J	mg/kg	33.6	3.37	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	73		40-140

Project Name: UDEX SONIC DRILLING
Lab Number: L2337688
Project Number: 213403364
Report Date: 11/06/23

SAMPLE RESULTS

Lab ID: L2337688-03
Client ID: UDEX-CD-02A-16-20230629
Sample Location: 3144 PASSYUNK AVE. PA PHILADELPHIA
Date Collected: 06/29/23 13:40
Date Received: 06/30/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Extraction Method:
Analytical Method: 1,8015D(M)
Analytical Date: 07/06/23 20:10
Analyst: BAD
Percent Solids: 95%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Gasoline Range Organics - Westborough Lab						
Gasoline Range Organics	0.66	J	mg/kg	2.3	0.045	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	103		70-130
4-Bromofluorobenzene	90		70-130

Project Name: UDEX SONIC DRILLING
Project Number: 213403364
Lab Number: L2337688
Report Date: 11/06/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 07/03/23 21:38
Analyst: SC

Extraction Method: EPA 3546
Extraction Date: 07/03/23 05:55

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 01-03 Batch: WG1798943-1					
TPH (C9-C44)	7.99	J	mg/kg	32.4	3.24

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	81		40-140

Project Name: UDEX SONIC DRILLING
Project Number: 213403364
Lab Number: L2337688
Report Date: 11/06/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 07/06/23 14:30
Analyst: BAD

Parameter	Result	Qualifier	Units	RL	MDL
Gasoline Range Organics - Westborough Lab for sample(s): 01-03 Batch: WG1800946-4					
Gasoline Range Organics	0.81	J	mg/kg	2.5	0.048

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	103		70-130
4-Bromofluorobenzene	90		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: UDEX SONIC DRILLING

Project Number: 213403364

Lab Number: L2337688

Report Date: 11/06/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01-03 Batch: WG1798943-2								
TPH (C9-C44)	78		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	78				40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: UDEX SONIC DRILLING

Project Number: 213403364

Lab Number: L2337688

Report Date: 11/06/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Gasoline Range Organics - Westborough Lab	Associated sample(s): 01-03		Batch: WG1800946-2		WG1800946-3			
Gasoline Range Organics	82		86		80-120	5		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,1,1-Trifluorotoluene	100		106		70-130
4-Bromofluorobenzene	87		92		70-130

Lab Duplicate Analysis
Batch Quality Control

Project Name: UDEX SONIC DRILLING
Project Number: 213403364

Lab Number: L2337688
Report Date: 11/06/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1798943-3 QC Sample: L2337688-01 Client ID: UDEX-CD-06-10.5-20230627						
TPH (C9-C44)	158	135	mg/kg	16		40

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	88		80		40-140

INORGANICS
&
MISCELLANEOUS

Project Name: UDEX SONIC DRILLING
Project Number: 213403364
Lab Number: L2337688
Report Date: 11/06/23

SAMPLE RESULTS

Lab ID: L2337688-01
Client ID: UDEX-CD-06-10.5-20230627
Sample Location: 3144 PASSYUNK AVE. PA PHILADELPHIA
Sample Depth:
Matrix: Soil

Date Collected: 06/27/23 12:00
Date Received: 06/30/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	91.2		%	0.100	NA	1	-	07/01/23 12:07	121,2540G	ROI

Project Name: UDEX SONIC DRILLING
Project Number: 213403364
Lab Number: L2337688
Report Date: 11/06/23

SAMPLE RESULTS

Lab ID: L2337688-02
Client ID: UDEX-CD-12D-14.8-20230628
Sample Location: 3144 PASSYUNK AVE. PA PHILADELPHIA
Sample Depth:
Matrix: Soil

Date Collected: 06/28/23 14:30
Date Received: 06/30/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	91.7		%	0.100	NA	1	-	07/01/23 12:07	121,2540G	ROI

Project Name: UDEX SONIC DRILLING
Project Number: 213403364
Lab Number: L2337688
Report Date: 11/06/23

SAMPLE RESULTS

Lab ID: L2337688-03
Client ID: UDEX-CD-02A-16-20230629
Sample Location: 3144 PASSYUNK AVE. PA PHILADELPHIA
Sample Depth:
Matrix: Soil

Date Collected: 06/29/23 13:40
Date Received: 06/30/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	94.6		%	0.100	NA	1	-	07/01/23 12:07	121,2540G	ROI

Lab Duplicate Analysis

Batch Quality Control

Project Name: UDEX SONIC DRILLING

Project Number: 213403364

Lab Number: L2337688

Report Date: 11/06/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1798627-1 QC Sample: L2337882-01 Client ID: DUP Sample						
Solids, Total	89.8	89.8	%	0		20

Project Name: UDEX SONIC DRILLING
Project Number: 213403364

Lab Number: L2337688
Report Date: 11/06/23

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2337688-01A	Vial MeOH preserved	A	NA		3.5	Y	Absent		PA-TPH-GRO(14),PA-8260HLW(14)
L2337688-01B	Vial water preserved	A	NA		3.5	Y	Absent	**01-JUL-23 03:57**	PA-8260HLW(14)
L2337688-01C	Vial water preserved	A	NA		3.5	Y	Absent	**01-JUL-23 03:57**	PA-8260HLW(14)
L2337688-01D	Plastic 2oz unpreserved for TS	A	NA		3.5	Y	Absent		TS(7)
L2337688-01E	Glass 60mL/2oz unpreserved	A	NA		3.5	Y	Absent		PA-TPH-DROD-C44(14)
L2337688-01F	Vial Large Septa unpreserved (4oz)	A	NA		3.5	Y	Absent		PA-TPH-GRO(14)
L2337688-02A	Vial MeOH preserved	A	NA		3.5	Y	Absent		PA-TPH-GRO(14),PA-8260HLW(14)
L2337688-02B	Vial water preserved	A	NA		3.5	Y	Absent	**01-JUL-23 03:57**	PA-8260HLW(14)
L2337688-02C	Vial water preserved	A	NA		3.5	Y	Absent	**01-JUL-23 03:57**	PA-8260HLW(14)
L2337688-02D	Plastic 2oz unpreserved for TS	A	NA		3.5	Y	Absent		TS(7)
L2337688-02E	Glass 60mL/2oz unpreserved	A	NA		3.5	Y	Absent		PA-TPH-DROD-C44(14)
L2337688-02F	Vial Large Septa unpreserved (4oz)	A	NA		3.5	Y	Absent		PA-TPH-GRO(14)
L2337688-03A	Vial MeOH preserved	A	NA		3.5	Y	Absent		PA-TPH-GRO(14),PA-8260HLW(14)
L2337688-03B	Vial water preserved	A	NA		3.5	Y	Absent	01-JUL-23 03:57	PA-8260HLW(14)
L2337688-03C	Vial water preserved	A	NA		3.5	Y	Absent	01-JUL-23 03:57	PA-8260HLW(14)
L2337688-03D	Plastic 2oz unpreserved for TS	A	NA		3.5	Y	Absent		TS(7)
L2337688-03E	Glass 60mL/2oz unpreserved	A	NA		3.5	Y	Absent		PA-TPH-DROD-C44(14)
L2337688-03F	Vial Large Septa unpreserved (4oz)	A	NA		3.5	Y	Absent		PA-TPH-GRO(14)

*Values in parentheses indicate holding time in days

Project Name:	UDEX SONIC DRILLING	**Lab Number:**	L2337688
Project Number:	213403364	**Report Date:**	11/06/23

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: DU Report with 'J' Qualifiers

Project Name:	UDEX SONIC DRILLING	**Lab Number:**	L2337688
Project Number:	213403364	**Report Date:**	11/06/23

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively

Report Format: DU Report with 'J' Qualifiers

Project Name:	UDEX SONIC DRILLING	**Lab Number:**	L2337688
Project Number:	213403364	**Report Date:**	11/06/23

Data Qualifiers

Identified Compounds (TICs). For calculated parameters, this represents that one or more values used in the calculation were estimated.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

ND - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Project Name:	UDEX SONIC DRILLING	**Lab Number:**	L2337688
Project Number:	213403364	**Report Date:**	11/06/23

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 6/30/23

ALPHA Job #: L2337688

Client Information

Client: PES c/o Stantec
Address: 1060 Andrew Dr Suite 140 West Chester, PA 19380
Phone: 610-850-1420
Fax:
Email: Andrew.Klingbeil@stantec.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: UDEX Sonic Drilling
Project Location: 3144 Passyunk Ave. Philadelphia PA
Project #: 213403364
Project Manager: Andrew Klingbeil
ALPHA Quote #: 21953

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due: Time:

Report Information - Data Deliverables

☐ FAX ☐ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program	Criteria

Other Project Specific Requirements/Comments/Detection Limits:

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	VOCs by EPA 8260D	TPH-GRO by 8015D	TPH-custom Ranges by 8015D	Sample Specific Comments	TOTAL # BOTTLES
37688-01	UDEX-CD-06-10.5-20230627	6/27/23	1200	S	AW	X	X	X		
-02	UDEX-CD-02A-14.8-20230628	6/28/23	1430	S	TL	X	X	X		
-03	UDEX-CD-12D-16-20230629	6/29/23	1340	S	TL	X	X	X		

SAMPLE HANDLING
Filtration
☐ Done ☐ Not needed ☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

Container Type	A	A
Preservative	A	A

Relinquished By:	Date/Time	Received By:	Date/Time
	6/30/23 12:12	STL-DAL	6/30/23 12:12
	6/30/23 1500	STL-DAL	6/30/23 15:00
	6/30/23 1830		6/30/23 18:30

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO. 01-01 (rev. 15-OCT-07)

Appendix G ChemQuants Environmental Forensics Report

ChemQuants™
ENVIRONMENTAL FORENSICS

Client: Stantec Consulting

ATTN: Andrew Klingbeil

Project#: 0253

Project name: PESRM UDEX #3

Laboratory#: L2365335

Interpreter

January 5, 2024

Andrew Klingbeil
Stantec Consulting
1060 Andrew Dr., Suite 140
West Chester, PA 19380

CQ Project# 0253
Project Name: PESRM UDEX (Addendum #3)

Introduction

I am the principal at ChemQuants, LLC, an environmental forensics firm in Santa Barbara, California. I received bachelor's degrees in Analytical Chemistry and Environmental Science from Florida International University and a Master's in Analytical Chemistry from Florida International University. My professional experience has focused on oil spill environmental forensics. My specialties include petroleum release investigations on coastal waterways, subsurface environments at petroleum terminals and fueling stations, and "big environmental data" chemometrics and data visualization. Besides being chair at a scientific conference, I have authored numerous publications and presentations to my peers.

I have been hired by Stantec Consulting concerning PESRM UDEX. I was asked to provide expert opinions regarding environmental forensics relating to one sample. This report is an addendum to a May 6, 2022, report focused on five samples from the same study area. This report is a second addendum to the last addendum report delivered on 10/12/2022. This report focuses on the characterization and historical comparisons of products collected from S-439. The most recent sample was collected from S-439 on 4/27/2023 and analyzed at the same laboratory with comparable methods to the other samples in this report. Also, a historic sample from S-439 was added. The historic sample was collected on 2/14/2020 and analyzed at Pace Energy. As such, the historic sample from Pace Energy was analyzed with a different SVOC range method that was not quantitative, and concentrations for analytes were not determined. Incompatibility of SVOC methods precluded applying the composition ratio analysis presented in Figure 1. Nonetheless, a VOC range dissolution study was used instead to compare the historic S-439 product to the most recently collected sample from S-439.

I was asked to answer the following question:

- What are the chemical source characteristics expressed in the sample?
- Was it possible to age constrain the fugitive petroleum release(s)?

Client ID	Lab ID	Date Collected	Date Received	Matrix	Saturated HCs GC/FID	C5-C12 VOC PIANO	Alkylated PAHs	Total Sulfur
BF-103R-20220315	L2213789-01	3/15/2022	3/16/2022	Product	X	X	X	X
S-283-20220315	L2213789-02	3/15/2022	3/16/2022	Product	X	X	X	X
S-480-20220315	L2213789-03	3/15/2022	3/16/2022	Product	X	X	X	X
S414-20220315	L2213789-04	3/15/2022	3/16/2022	Product	X	X	X	X
S382-20220315	L2213789-05	3/15/2022	3/16/2022	Product	X	X	X	X
UDEX-EW-19-CONDENSATE	L2242911-01	7/26/2022	08/10/2022	Product	X (Whole Oil)	X	X (& Full scan TIC)	

S-439_20230427	L2365335-01	4/27/2023	11/3/2023	Product		X	X (& Full scan TIC)	
S-439	32999-3	2/14/2020	2/17/2020	Product		X	X (PACE Full Scan)	

The samples were delivered to Alpha Analytical, Inc. (Mansfield, MA) and analyzed with the following analytical methods[1]:

1) Whole Oil by GC/FID
2) Saturated Hydrocarbons by GC/FID / EPA 8015B (Mod.)
3) C5-C12 PIANO w/ Oxygenates and additives quantification and fingerprinting by GC/MS – full scan mode / EPA 8260B (Mod.)
4) Alkylated PAHs by GC/MS (SIM) EPA 8270D (Mod.)
5) Sulfur in Petroleum by ASTM D4294

Investigative methodology

The forensics quality chemical data were evaluated with data analysis techniques typically used in subsurface petroleum investigations[2]. This report focuses on an expanded scope of questions related to the character, potential source relationship, and possible release time. The petroleum refinery process and properties lines of evidence were applied based on well-established process forensics insights.

Addendum #0253 – This report extends the investigative methodology to one new sample collected from the study area – UDEX-EW-19-CONDENSATE (L2242911-01).

Addendum #3 #0253 – This report extends the investigative methodology to two samples collected from S-349_20230427 (L2365335-01)

Results and Discussion

Petroleum Mixtures and Characteristics – 3-part mixtures with varying proportions are noted in select samples: a) A reformate type ~C5-C8 boiling range signature (see PIANO Bar graphs in figures 7 to 12) b) a naphtha range type ~C8-C16 boiling range signatures was apparent in two of five project samples (see PIANO Bar graphs in figures 8 and 9), and c) two of five samples exhibit compositional attributes of a middle distillate range fuel (see GC/FID in figure 8). An approximating summary of the compositional petroleum attributes is shown in Table 1, and the grouped bar graph is in Figure 1.

- The reformate type product was the most dominant signature in four project samples – BF-103R-20220315, S-283-20220315, S-414-20220315, and S-382-20220315. The reformate type component was an isoparaffin dominant C5-C8 range refinery feedstock enriched in two C2-monoaromatics – Benzene and Toluene.
- The light naphtha boiling range signature was possibly a light Jet Fuel (e.g., JP-4, given evidence of their storage at the Site. Jet Fuel-like signatures may have been present at trace amounts in BF-103R-20220315, S-414-20220315, and S-382-20220315 but were explicitly present in S-283-20220315 and S-480-20220315.
- Traces of the middle distillate range fuel component were present in three samples - BF-103R-20220315, S-414-20220315, and S-382-20220315, which were confirmed by the diagnostic bicyclane signatures (figure 3). Two samples, S-283-20220315 and S-480-20220315, exhibited a

[1] Douglas, G.D., Emsbo-Mattingly, S.D., Stout, S.A., Uhler, A.D., and McCarthy, K.J. (2007) Chemical fingerprinting of hydrocarbons and polychlorinated biphenyls. In: *Introduction to Environmental Forensics, 2nd Ed.*, B. Murphy and R. Morrison, Eds., Academic Press, New York, pp. 317-459.
[2] Morrison, Robert D., and Brian L. Murphy. *Environmental forensics: contaminant specific guide*. Academic Press, 2010.and

diagnostic UCM signature that extended to the middle distillate petroleum range (figures 8 and 10). Yet, none of the samples were dominated by the middle distillate range petroleum component aspect.

Biodegradation Properties of Middle Distillate Fuel – Among middle distillate hydrocarbons, n-paraffins are the first to be depleted by biodegradation and serve as the primary determinant for biodegradation (Table 1 nC17/Pr ratio & Figures 8 and 10)[3]. Regarding biodegradation, the relative proportions of nC17 to pristane suggest that the middle distillate was severely altered.

Biodegradation Properties of the Light Jet Fuel-like Aspect – Among naphtha to kerosene range hydrocarbons, n-paraffins are the first to be depleted by biodegradation and serve as the primary determinant for biodegradation (Table 1 SHC Bar Graphs in Figure 8 and 10)[4]. Regarding biodegradation, the relative proportions of nC13 to IS 1380 suggest that the product was heavily altered.

Middle Distillate Petroleum Type Determinations and Age Constraining – Sulfur reductions over the last 20+ years have been achieved for the most part through hydrodesulfurization (HDS)[5]. This refinery process (HDS) can be reflected by changes to certain dibenzothiophenes (DBT) isomers. DBTs with methyl or ethyl groups in the 4-position are highly resistant to HDS. Other DBT isomers are less resistant and are destroyed during the HDS process[6]. The DBT signatures can help support diesel fuel age and source fingerprint determinations. The C2 DBT signatures supported an approximate diesel fuel age determination. The C2 dibenzothiophenes exhibited signatures consistent with middle distillate fuels not exposed to hydrotreating (Figure 5) and proportions of alkylated decalins to alkylated naphthalenes (figures 8 and 10). The high sulfur enrichment in the middle distillate fuel is also reflected in the proportions of phenanthrenes to dibenzothiophenes (Table 1, figures 8 and 10).

These sulfur lines of evidence support the conclusion that the middle distillate fuel in both samples was likely a historic high sulfur middle distillate fuel or an unfinished and possibly more recent middle distillate fuel. Based on these lines of evidence, the middle distillate fuels were either perhaps released before 2007 or an unfinished middle distillate fuel that cannot be age-dated with sulfur-based lines evidence from a biodegradation standpoint and considering that the samples were possibly collected from a weak to moderate weathering potential regime, the middle distillate fuels in S-283-20220315 and S-382-20220315 likely experience a residence time in the environment between 16-40 years.

VOC Range Refinery Feedstock Age Constraining – Four of the five project samples exhibited signatures enriched in VOC range petroleum products' most volatile and water-soluble hydrocarbons. The enrichment of weathering amenable hydrocarbons suggests that environmental forces did not significantly alter the VOC range component of the mixture. Nonetheless, the VOC range petroleum age constraining cannot be conducted with the available data.

Middle Distillate Range Source Comparisons - Table 1, figure 2 (top and bottom), and Figure 3 summarize the resulting values of source diagnostic ratios that are relatively more resistant to weathering-induced alterations in the subsurface. The ratios included two sulfur heterocyclic PAH ratios and two bicyclic sesquiterpanes ratios. The preponderance of evidence suggested that the middle distillate petroleum in BF-103R-20220315 and S-414-20220315 were likely distinct from the middle distillate petroleum range S-283-20220315 and S-480-20220315. The middle distillate range petroleum in S-382-20220315 may have been a mixture of the two populations or unrelated from a "genetic" standpoint.

[3] Wenger, Lloyd M., Cara L. Davis, and Gary H. Isaksen. "Multiple controls on petroleum biodegradation and impact on oil quality." *SPE Reservoir Evaluation & Engineering* 5.05 (2002): 375-383.
[4] Wenger, Lloyd M., Cara L. Davis, and Gary H. Isaksen. "Multiple controls on petroleum biodegradation and impact on oil quality." *SPE Reservoir Evaluation & Engineering* 5.05 (2002): 375-383.
[5] Leffler, W. L. "Petroleum Refining in Nontechnical Language. (ed.) PennWell Corporation." *Tulsa, OK* (2000).
[6] Schade, Thomas, Benedikte Roberz, and Jan T. Andersson. "Polycyclic aromatic sulfur heterocycles in desulfurized diesel fuels and their separation on a novel palladium (II)-complex stationary phase." *Polycyclic Aromatic Compounds* 22.3-4 (2002): 311-320.

Comparisons to product samples from PACE 32999 Report – This is a slight revision to the interpretive report PACE 32999. The only revision is that sample S-439 (32999-3) exhibits an additional light Jet fuel mixture component. The mixture characteristic evident in S-439 (32999-3) was more similar to the petroleum expressions in S-283_20220315, although S-439 (32999-3) in the PACE report may have exhibited a greater proportion of middle distillate range fuel. The reformate type signature evident in BF-103R-20220315, S-283-20220315, S-414-20220315, and S-382-20220315, was comparable to the OVC range signature expressed in all three PACE samples – S-437 (32999-1), S-438 (32999-2), and S-439 (32999-3). The middle distillate range fuel evident in two samples from the PACE report – S-437 (32999-1) and S-439 (32999-3) were comparable to the middle distillate range products exhibited in S-283-20220315 and S-382-20220315.

Addendum #0253 – The LPH in sample UDEX-EW-19 CONDENSATE (L2242991-01) exhibited a mixture of petroleum products that included a residual range (heavier) petroleum to the gasoline range to middle distillate range petroleum displayed in 5 LPH reviewed in the last report.

- The residual range petroleum features are shown in the extended range of unresolved complex mixture ("UCM') (figure 13), enrichments of 4-6 ringed PAHs (figure 13), and enrichments of residual range biomarkers (in main data package). The residual range petroleum product occurred in the mixture at a significantly lower level when compared to the reformate type and middle distillate products.
- The reformate type component was an isoparaffin dominant C5-C8 range refinery feedstock enriched in two C2-monoaromatics – Benzene and Toluene (figure 13).
- The light naphtha boiling range signature was possibly a light Jet Fuel (e.g., JP-4, given evidence of their storage at the Site. The Jet Fuel-like signature may have been present at a trace amount.
- A middle distillate range component in the LPH is confirmed by the diagnostic bicyclane signatures (figures 4 and 13).

The relative proportions of the mixture components in the LPH were shown in the grouped bar graph in Figure 1 and listed in Table 1.

Among middle distillate hydrocarbons, n-paraffins are the first to be depleted by biodegradation and serve as the primary determinant for biodegradation (Table 1 nC17/Pr ratio & Figures 4 and 13)[7]. Regarding biodegradation, the relative proportions of nC17 to pristane suggest that the middle distillate was severely altered.

The C2 dibenzothiophenes exhibited signatures consistent with middle distillate fuels not exposed to hydrotreating (Figure 6) and proportions of alkylated decalins to alkylated naphthalenes (figure 13). The high sulfur enrichment in the middle distillate fuel is also reflected in the proportions of phenanthrenes to dibenzothiophenes (Table 1, figure 13).

These sulfur lines of evidence support the conclusion that the middle distillate fuel in the LPH was likely a historic high sulfur middle distillate fuel or an unfinished and possibly more recent middle distillate fuel. Based on these lines of evidence, the middle distillate fuels in the LPH were either perhaps released before 2007 or an unfinished middle distillate fuel that cannot be age-dated with sulfur-based lines of evidence from a biodegradation standpoint and considering that the samples were possibly collected from a weak to moderate weathering potential regime, the middle distillate fuels in the LPH likely experience a residence time in the environment between 16-40 years.

[7] Wenger, Lloyd M., Cara L. Davis, and Gary H. Isaksen. "Multiple controls on petroleum biodegradation and impact on oil quality." *SPE Reservoir Evaluation & Engineering* 5.05 (2002): 375-383.

Table 1 and Figure 2 (top and bottom) summarize the resulting values of source diagnostic ratios that are relatively more resistant to weathering-induced alterations in the subsurface. The ratios included two sulfur heterocyclic PAH ratios and two bicyclic sesquiterpanes ratios. The preponderance of evidence suggested that the middle distillate petroleum in the LPH may have been a mixture of the two populations or unrelated from a "genetic" standpoint.

Addendum #3 #0253 – The LPH in sample **S-439 (L2365335-01)** exhibited a mixture of petroleum products that included a gasoline range to middle distillate range petroleum displayed in 5 LPH reviewed in the last report.

- The reformate type component was an isoparaffin dominant C5-C8 range refinery feedstock enriched in two C2-monoaromatics – Benzene and Toluene (figure 15).
- The light naphtha boiling range signature was possibly a light Jet Fuel (e.g., JP-4, given evidence of their storage at the Site. The relative enrichment factor (relative to reformate and middle distillate) of the Jet Fuel-like signature was calculated in Table 2 and presented as a grouped bar graph in Figure 1.
- A middle distillate range component in the LPH is confirmed by the hydrocarbon distributions evident in the GC/FID chromatogram and distributions of light to middle distillate range diagnostic biomarkers, like bicyclane 123 m/z (Figure 15).

The relative proportions of the mixture components in the LPH were shown in the grouped bar graph in Figure 1 and listed in Table 1.

Among middle distillate hydrocarbons, n-paraffins are the first to be depleted by biodegradation and serve as the primary determinant for biodegradation (Tables 1 and 2 - nC17/Pr ratio & Figure 15)[8]. Regarding biodegradation, the relative proportions of nC17 to pristane suggest that the middle distillate in S-439_20230427 (L2365335-01) was severely altered and exhibited a weathered state comparable to the product collected from S-283_20220315 (L2213789-02).

The C2 dibenzothiophenes from S-439_20230427 (L2365335-01) exhibited signatures consistent with middle distillate fuels not exposed to hydrotreating (Figure 16) and proportions of alkylated decalins to alkylated naphthalenes (figure 15). The high sulfur enrichment in the middle distillate fuel is also reflected in the proportions of phenanthrenes to dibenzothiophenes (Table 2, figure 15).

These sulfur lines of evidence support the conclusion that the middle distillate fuel in the LPH was likely a historic high sulfur middle distillate fuel or an unfinished and possibly more recent middle distillate fuel. Multiple lines of biomarker evidence showed that all petroleum components of the mixture in S-439_20230427 (L2365335-01) matched the fingerprint attributes expressed in product samples collected from S-283_20220315 (L2213789-02) and S-480_20220315 (L2213789-03) (Figure 2).

Considering the relative proportionalities of petroleum types in S-439_20230427 (L2365335-01), it was evident that this most recently collected product expressed reformate abundance, relative to light naphtha range and middle distillate range petroleum, comparable to UDEX-EW-19 CONDENSATE (L2242991-01), see Figure 1. Notably, S-439_20230427 (L2365335-01) exhibited slightly more depletion of the naphtha range component relative to the middle distillate range component.

A qualitative source composition review of the historic S-439 32999-3 (2/14/2020) was conducted since the sample was not analyzed with a comparable quantitative SVOC method. The distributions of VOC range and light to middle distillate range biomarkers showed that fingerprint aspects in the historic S-439 sample were comparable to the source compositional qualities of the product collected more recently

[8] Wenger, Lloyd M., Cara L. Davis, and Gary H. Isaksen. "Multiple controls on petroleum biodegradation and impact on oil quality." *SPE Reservoir Evaluation & Engineering* 5.05 (2002): 375-383.

from 439_20230427 (L2365335-01), S-283_20220315 (L2213789-02) and S-480_20220315 (L2213789-03) (Figures 14 and 16).

As noted, the incompatibility of the SOC range method precluded using the composition ratio approach to evaluate relative composition attributes of the said parts of the mixture in the sample. Yet, critical to this report is knowing the relative compositional changes between S-439 in 2020 and S-439 in 2023. It was learned that the S-439 product 2023 exhibited a more depleted state of reformate relative to light to middle distillate products, as shown in Tables 1 and 2 and Figure 1. So, the critical question is: "Does the more recently collected product from S-439_20230427 (L2365335-01) exhibit a more environmentally altered chemical signature compared to the historic product S-439 32999-3 (2/14/2020)?" Unfortunately, the only way to answer this question is by inference due to the incompatibility of the SVOC methods. I can confidently state that both S-349 samples were source compositional matches – a mixture of products from the same sources. Also, S-349 exhibited enhanced reformate depletion, as was observed in UDEX-EW-19 CONDENSATE (L2242991-01).

Due to the incompatibility of the SVOC range method, we could not assess the impact by evaporation or biodegradation of the reformate vs. SVOC range products in the same manner as the other samples in this report; however, both samples, S-439 in 2020 and S-439 in 2023 were analyzed with comparable VOC range methods. Consequently, the impact of dissolution of VOC range hydrocarbons in the mixtures was assessed with two VOC range dissolution ratios (benzene / 2-methylhexane; toluene / 3-methylhexane). The dissolution ratios compared behaviors of hydrocarbons that exhibited different solubility characteristics (Figure 17). So, it was defensibly shown that the reformate feature of the historic S-439 in 2020 was significantly richer in nC5 to nC8 C2 monoaromatic hydrocarbons, benzene, and toluene when compared to the product collected more recently from S-439 (Figure 17). Then, by inference, it was opined that the VOC range reformate component was reduced relative to the SVOC range hydrocarbons, as expressed by aqueous dissolution or biodegradation of C2 monoaromatic hydrocarbons relative to less soluble VOC isoparaffin hydrocarbons 2-methylhexane and 3-methylhexane.

Conclusion

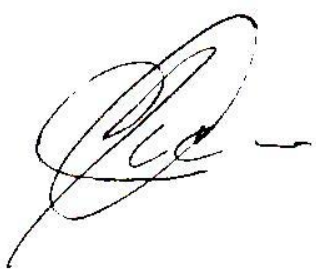
Multiple lines of evidence were applied to the five project samples. They showed that mixtures of three petroleum types were evident in all samples – at varying degrees (see the body of the text for details). The reformate type component of the mixture was not amenable to age constraining (see the body of the text for more information). The naphtha range (light Jet fuel) petroleum signature was heavily biodegraded, with a residence time in the subsurface estimated at ~12 to 30 years. The middle distillate range petroleum signature was significant in two of the five samples and was severely altered by biodegradation. The time of residence of the middle distillate range fuel was constrained to ~16 to 40 years.

Addendum #3 – Comparison of S-439 samples – a) S-439 (2020) matched S-439 (2023) from a source composition standpoint. Also, it was shown that S-439 (2023) exhibited enhanced reformate depletion, as was evident in UDEX-EW-19 CONDENSATE (L2242991-01). Essentially, S-439 (2023) exhibited less reformate relative to the SVOC range products compared to the other report samples, except for UDEX-EW-19 CONDENSATE (L2242991-01) and S-480-20220315 (L2213789-03). Also, it was presented that S-439_20230427 (L2365335-01) was more depleted of C2-monoaromatics, benzene, and toluene when compared to the S-439 (2020) sample.

Upon receipt of additional information, I reserve the right to modify and supplement my opinions outlined in this report.

You may email questions or concerns to markcejas@chemquants.com regarding chemistry data or interpretation.

Respectfully submitted,



Mark Jonathan Cejas
Principal

ChemQuants project ID	221	221	221	221	221	253
Project Name	PESRM UDEX RELEASE	PESRM UDEX RELEASE	PESRM UDEX RELEASE	PESRM UDEX RELEASE	PESRM UDEX RELEASE	PESRM UDEX RELEASE
Sample ID	BF-103R_20220315	S-283_20220315	S-480_20220315	S-414_20220315	S-382_20220315	IDEX-EW-19 CONDENSAT
Laboratory ID	L2213789-01	L2213789-02	L2213789-03	L2213789-04	L2213789-05	L2242991-01
Sample Type	OIL	OIL	OIL	OIL	OIL	OIL
% Composition Ratios (Reformate vs. Light Naphtha Range, Middle Distillate, & Residual Range)						
[2-methylhexane / (2-methylhexane+2-methylheptane+C2-phenanthrenes+C2-chrysenes)] x 100	97.5	94.7	27.1	98.0	98.2	88.1
% Composition Ratios (Light Naphtha Range vs. Reformate, Middle Distillate, & Residual Range)						
[2-methylheptane / (2-methylheptane+2-methylhexane+C2-phenanthrenes+C2-chrysenes)] x 100	2.5	4.9	48.6	2.0	1.8	6.8
% Composition Ratios (Middle Distillate vs. Reformate, Light Naptha, & Residual Range)						
[C2-phenanthrenes / (C2-phenanthrenes+2-methylhexane+2-methylheptane+C2-chrysenes)] x 100	0.001	0.38	24.2	0.002	0.002	3.6
% Composition Ratios (Residual Range vs. Reformate, Light Naptha, & Middle Distillate)						
[C2-chrysenes / (C2-phenanthrenes+2-methylhexane+2-methylheptane+C2-chrysenes)] x 100	0.0	0.0	0.0	0.0	0.0	1.5
Light Naphtha Range Parameters						
n-paraffins (85 m/z)	--	~75% Depleted	~>50% Depleted	--	--	--
Alkylcyclohexanes (83 m/z)	--	Not Significantly Depleted	Not Significantly Depleted	--	--	--
Middle Distillate Range Parameters						
n-paraffins (85 m/z)	--	~>98% Depleted	All Depleted	--	--	~>98% Depleted
Alkylcyclohexanes (83 m/z)	--	Not Significantly Depleted	Not Significantly Depleted	--	--	Depleted
n-C17 / Pristane	--	0.11	0	--	--	~0
D2 / P2	--	0.94	0.72	--	--	0.48
D3 / P3	--	1.33	1.01	--	--	0.54
Pristane / Phytane	--	2.21	1.78	--	--	2.59
Bicyclanes Source Ratios						
m / (m+n)	0.44	0.46	0.46	0.42	0.44	0.47
(m+n) / (m+n+n'+o)	0.60	0.78	0.79	0.60	0.72	0.74
r / (r +n)	0.51	0.51	0.54	0.52	0.52	0.58
r / (r +p+q)	0.68	0.71	0.77	0.70	0.71	0.70
C2 Dibenzothiophenes Source Ratios						
DC4 / (DC4+DC5)	0.34	0.58	0.59	0.38	0.41	0.45
DC3 / (DC3+DC5)	0.42	0.74	0.73	0.45	0.54	0.56
Sulfur Attributes						
DBTs and Decalins	--	Not Significantly Enriched	Not Significantly Enriched	--	--	Not Significantly Enriched
Potential Weathering Regime at Site	--	Assumed Moderate/Weak	Assumed Moderate/Weak	--	--	Assumed Moderate/Weak
Total Sulfur (ppm)	<100	537.0	4720.0	<100	<100	NA
Light Naphtha Range Age Constraint						
Approximate Age Estimation of Fuel (Via. Biodegredation LOE)	--	~12-30 yrs	~12-30 yrs	--	--	--
Middle Distillate Range Age Constraint						
Approximate Age Estimation of Fuel (Via. Sulfur LOE)	--	NA (Possibly Pre-sulfur Treated Product)	NA (Possibly Pre-sulfur Treated Product)	--	--	NA (Mixed w/ res. range)
Approximate Age Estimation of Fuel (Via. Biodegredation LOE)	--	~16-40 yrs	~16-40 yrs	--	--	~16-40 yrs

Note: If field is "NR" a ratio was not calculable.
If field is -- hydrocarbons occurred at trace levels
If field is "NA" a ratio was not analyzed.

Table 1. Table of diagnostic VOC and SVOC properties.

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Santa Barbara, CA 93101
www.ChemQuants.com

Interpreter

ChemQuants project ID	PACE	221
Project Name	PESRM UDEX RELEASE	PESRM UDEX RELEASE
Sample ID	S-439	S-439_20230427
Laboratory ID	32999-3 (2/14/2020)	L2365335-01
Sample Type	OIL	OIL
% Composition Ratios (Reformate vs. Light Naphtha Range, Middle Distillate, & Residual Range)		
[2-methylhexane / (2-methylhexane+2-methylheptane+C2-phenanthrenes+C2-chrysenes)] x 100	No Quant. SVOC data	85.6
% Composition Ratios (Light Naphtha Range vs. Reformate, Middle Distillate, & Residual Range)		
[2-methylheptane / (2-methylheptane+2-methylhexane+C2-phenanthrenes+C2-chrysenes)] x 100	No Quant. SVOC data	9.6
% Composition Ratios (Middle Distillate vs. Reformate, Light Naptha, & Residual Range)		
[C2-phenanthrenes / (C2-phenanthrenes+2-methylhexane+2-methylheptane+C2-chrysenes)] x 100	No Quant. SVOC data	4.78
% Composition Ratios (Residual Range vs. Reformate, Light Naptha, & Middle Distillate)		
[C2-chrysenes / (C2-phenanthrenes+2-methylhexane+2-methylheptane+C2-chrysenes)] x 100	No Quant. SVOC data	0.0
Light Naphtha Range Parameters		
n-paraffins (85 m/z)	~40% Depleted	~75% Depleted
Alkylcyclohexanes (83 m/z)	Not Significantly Depleted	Not Significantly Depleted
Middle Distillate Range Parameters		
n-paraffins (85 m/z)	~>65% Depleted	~>98% Depleted
Alkylcyclohexanes (83 m/z)	Not Significantly Depleted	Not Significantly Depleted
n-C17 / Pristane	No Quant. SVOC data	--
D2 / P2	No Quant. SVOC data	0.78
D3 / P3	No Quant. SVOC data	1.01
Pristane / Phytane	No Quant. SVOC data	--
Bicyclanes Source Ratios		
m / (m+n)	Similar Fingerprint to L2365335-01	0.46
(m+n) / (m+n+n'+o)	Similar Fingerprint to L2365335-01	0.79
r / (r +n)	Similar Fingerprint to L2365335-01	0.51
r / (r +p+q)	Similar Fingerprint to L2365335-01	0.71
C2 Dibenzothiophenes Source Ratios		
DC4 / (DC4+DC5)	Similar Fingerprint to L2365335-01	0.57
DC3 / (DC3+DC5)	Similar Fingerprint to L2365335-01	0.73
Sulfur Attributes		
DBTs and Decalins	Similar Fingerprint to L2365335-01	Not Significantly Enriched
Potential Weathering Regime at Site	Assumed Moderate/Weak	Assumed Moderate/Weak
Total Sulfur (ppm)	NA	NA
Light Naphtha Range Age Constraint		
Approximate Age Estimation of Fuel (Via. Biodegredation LOE)	Similar Fingerprint to L2365335-01	~12-30 yrs
Middle Distillate Range Age Constraint		
Approximate Age Estimation of Fuel (Via. Sulfur LOE)	Similar Fingerprint to L2365335-01	NA (Possibly Pre-sulfur Treated Product)
Approximate Age Estimation of Fuel (Via. Biodegredation LOE)	Similar Fingerprint to L2365335-01	~16-40 yrs

Note: If field is "NR" a ratio was not calculable.
If field is -- hydrocarbons occurred at trace levels
If field is "NA" a ratio was not analyzed.

Table 2. Table of diagnostic VOC and SVOC properties (S349 Compare).

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Interpreter

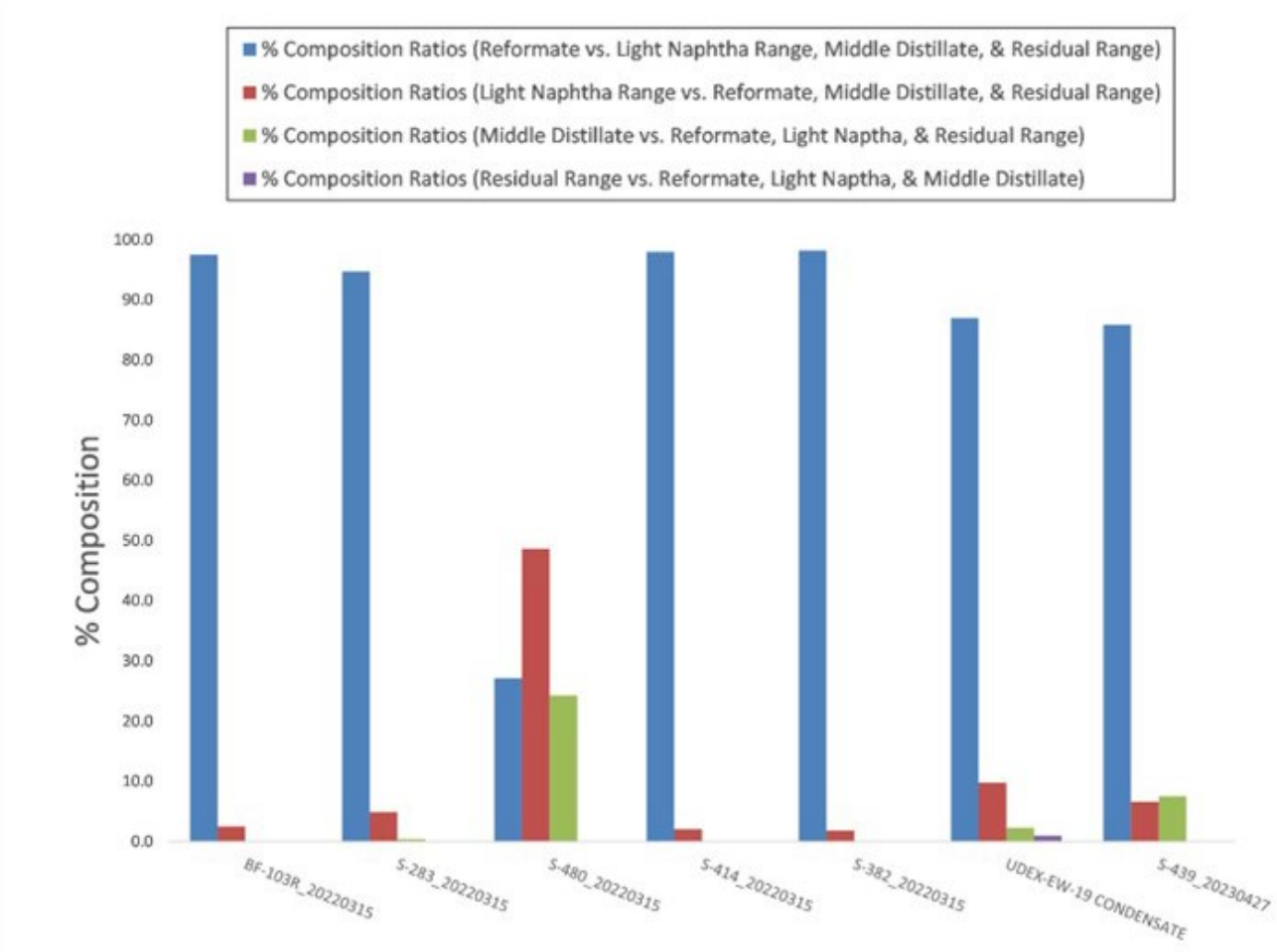


Figure 1. Group bar graph of petroleum type % composition.

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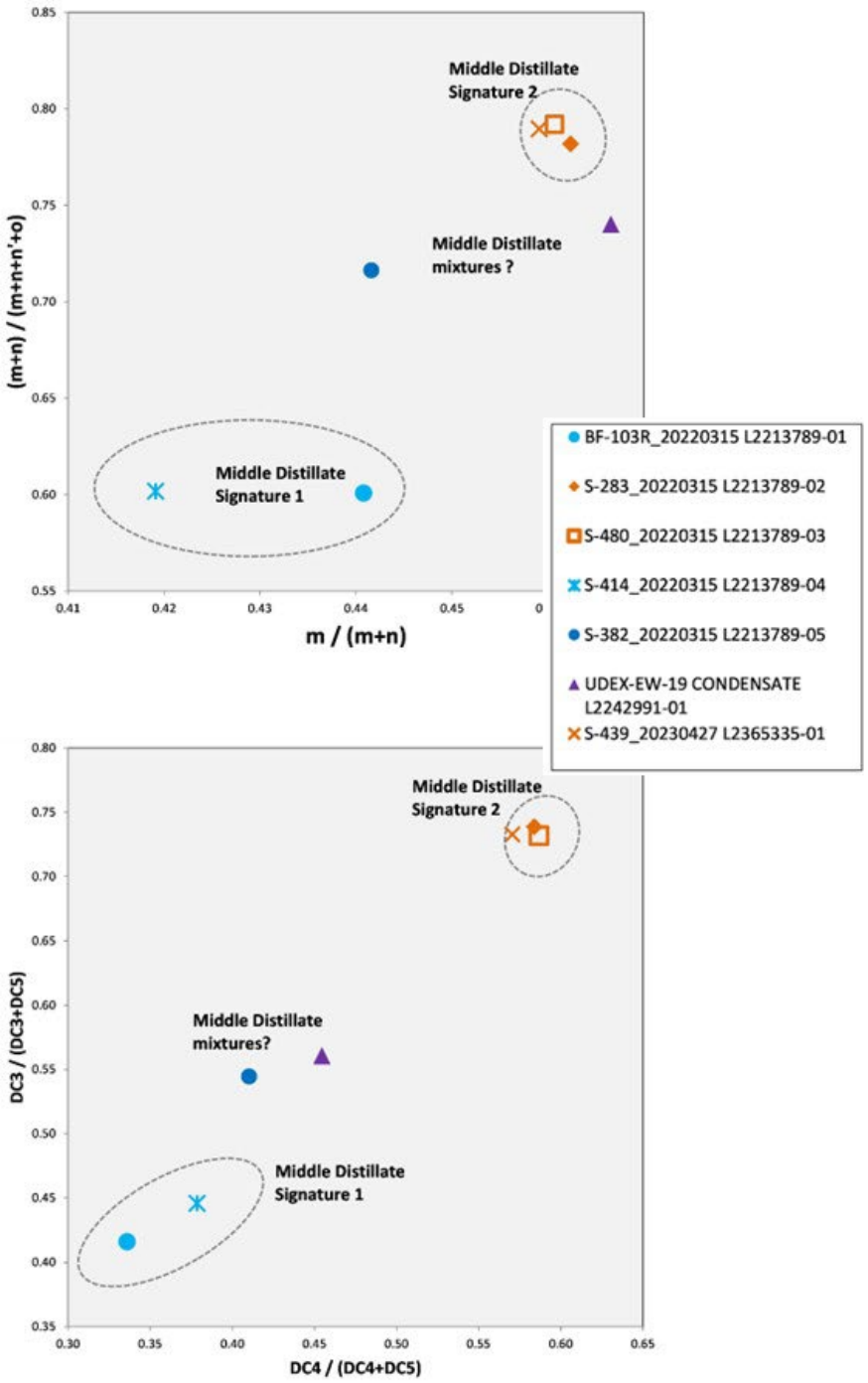


Figure 2. Scatter plot of bicyclane (124 m/z) diagnostic ratios (top)., C2 dibenzothiophene isomers (bottom).

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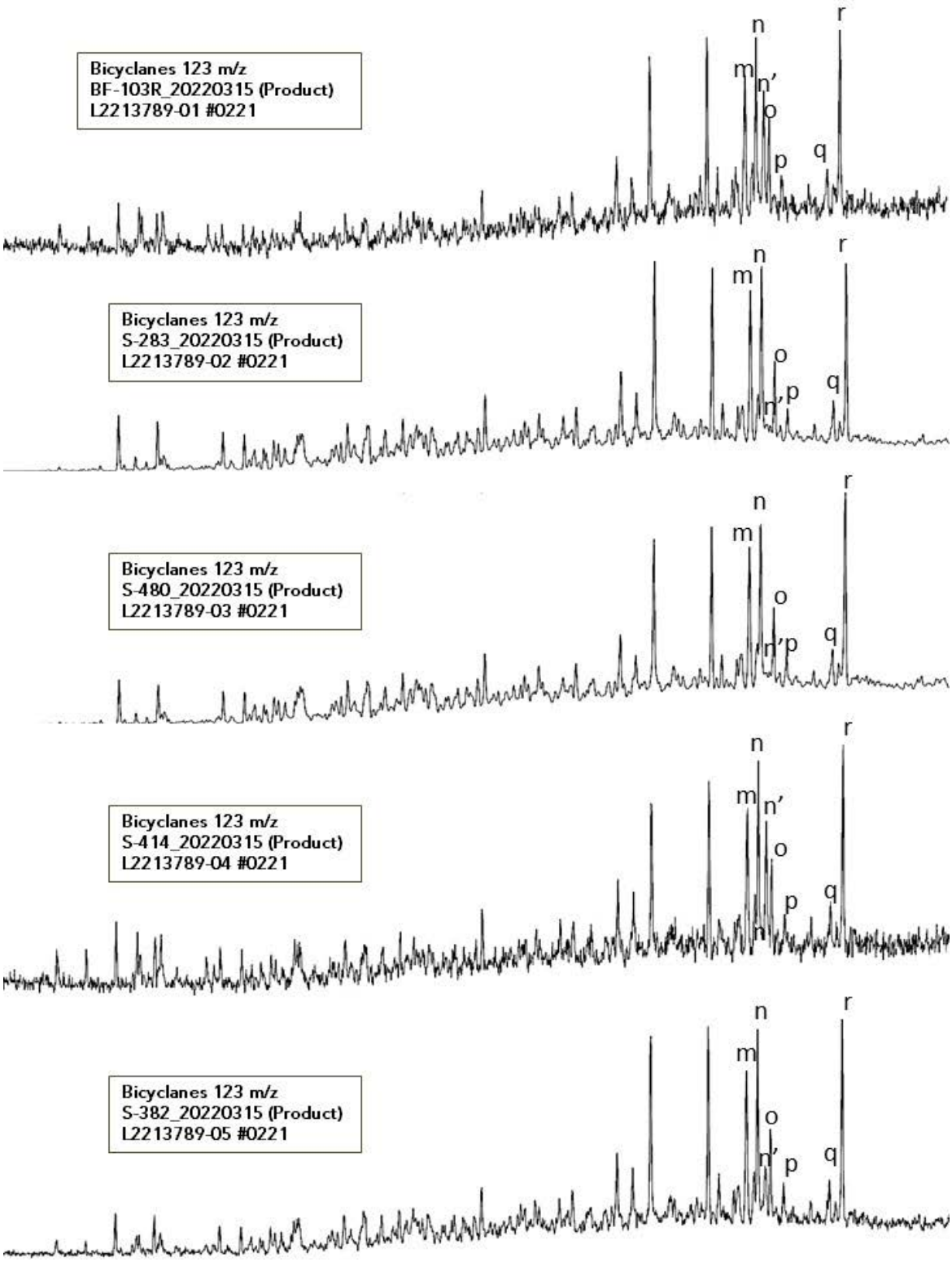


Figure 3. Ion trace fingerprints of bicyclanes (123 m/z).

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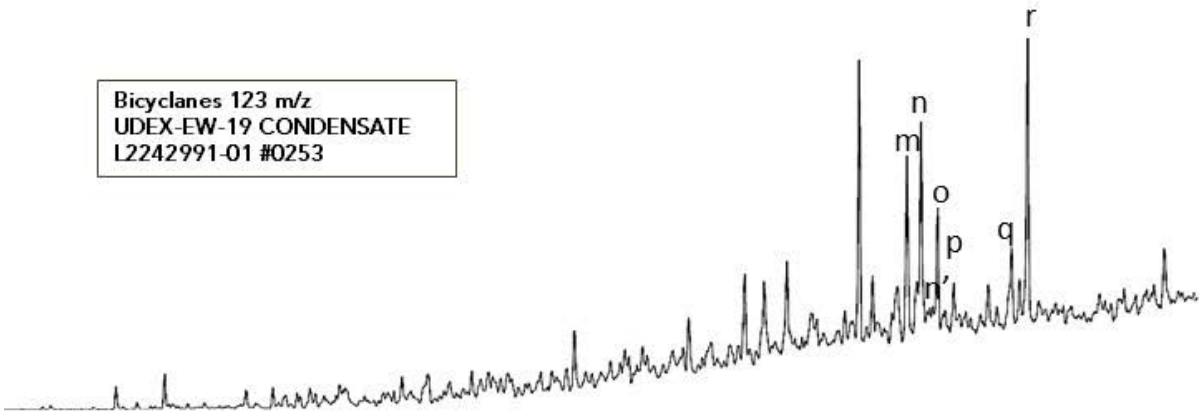


Figure 4. Ion trace fingerprints of bicyclanes (123 m/z).

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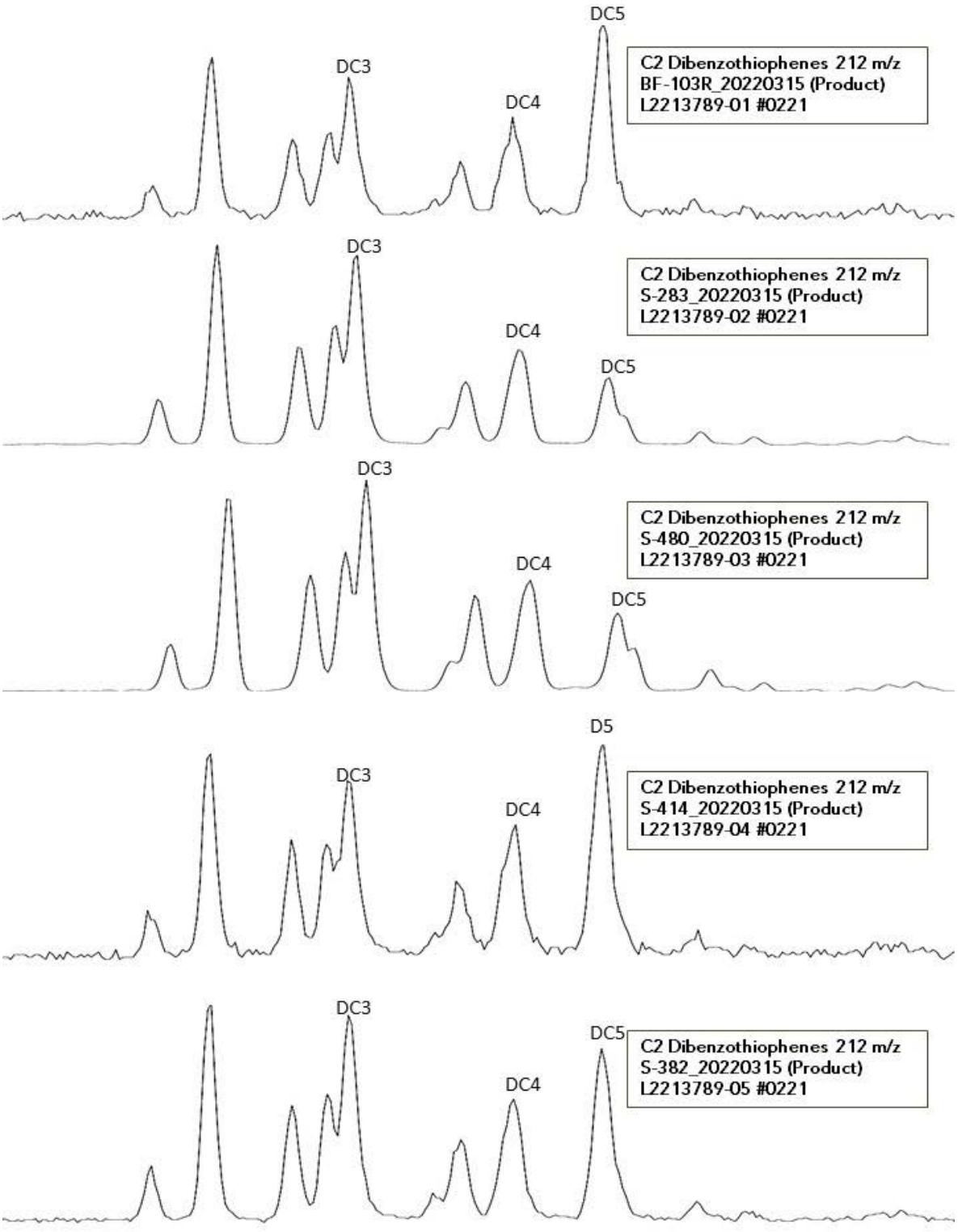


Figure 5. Ion trace fingerprints of C2 Dibenzothiophene isomers (212 m/z).

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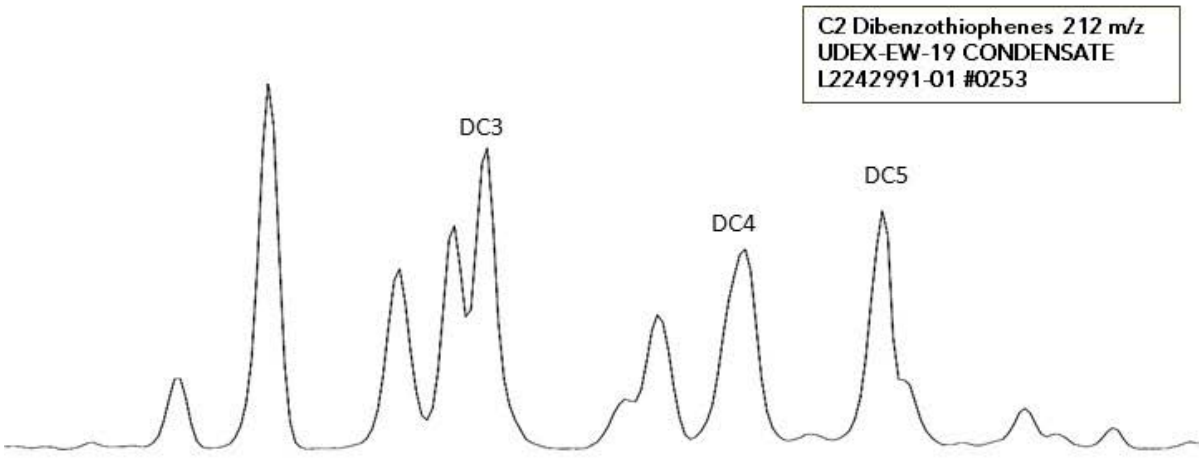


Figure 6. Ion trace fingerprints of C2 Dibenzothiophene isomers (212 m/z).

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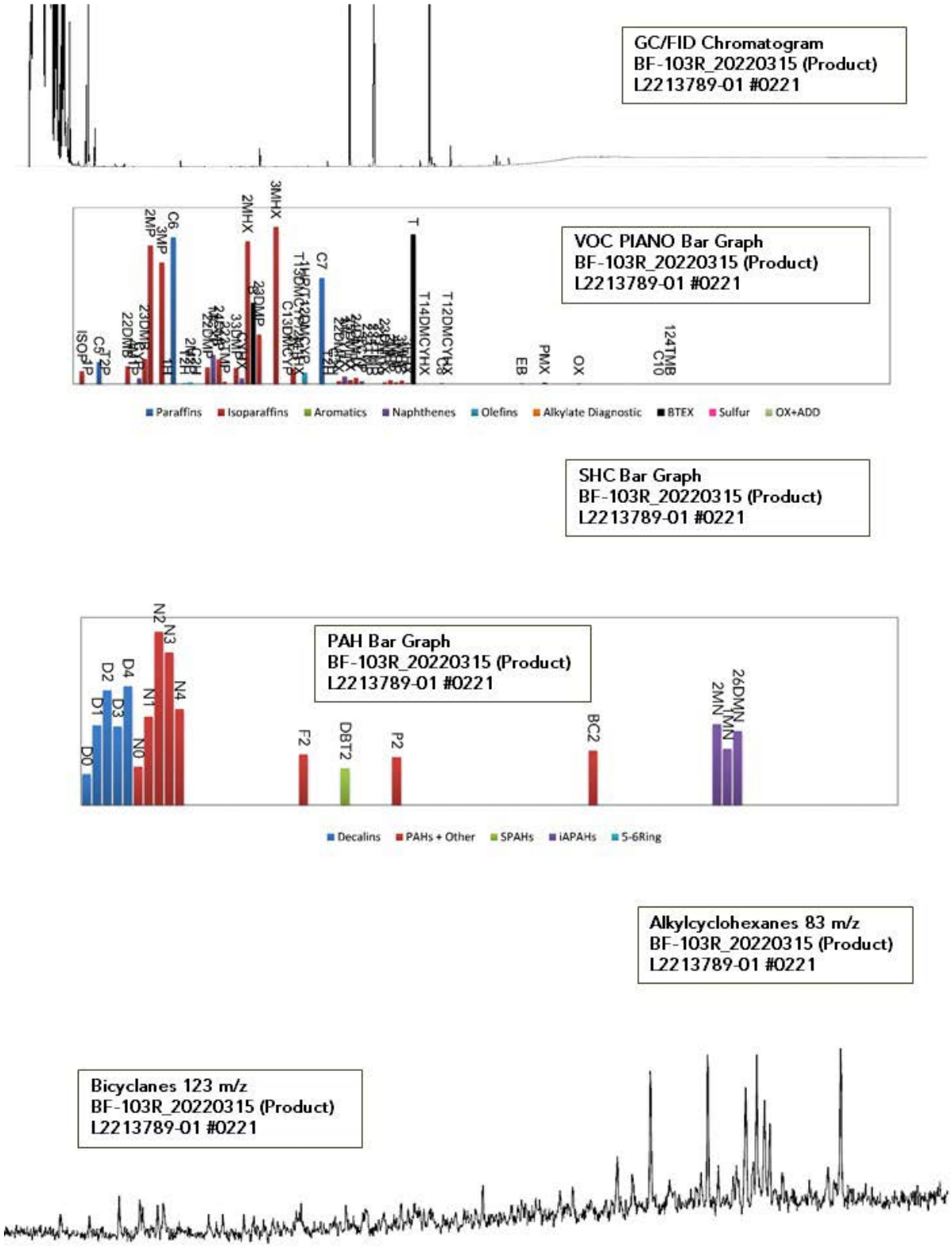


Figure 7. Fingerprint Mosaics™ for product samples.

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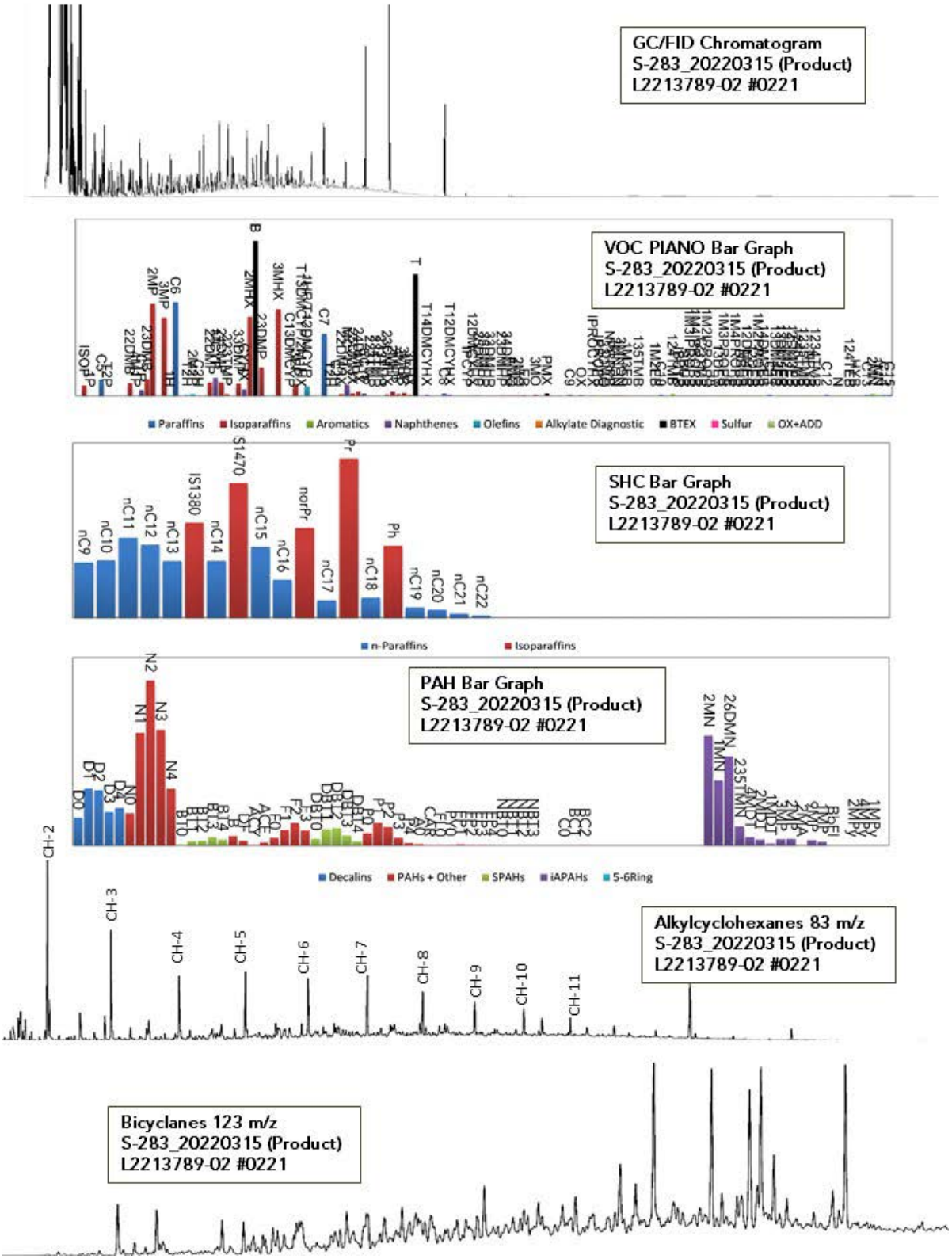


Figure 8. Fingerprint Mosaics™ for product samples.

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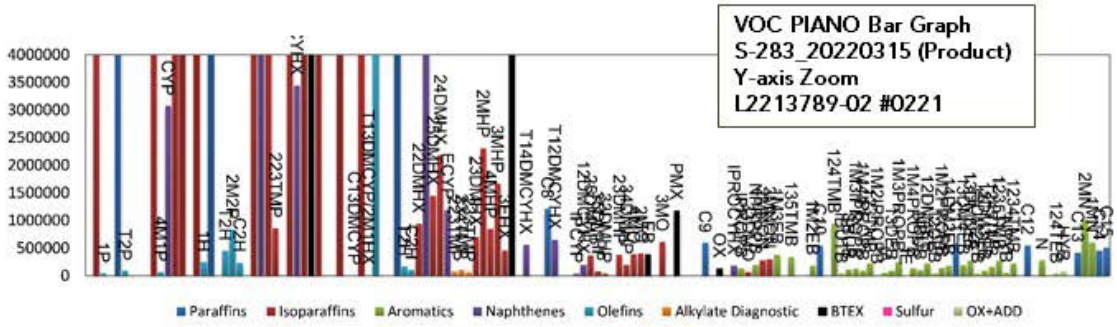


Figure 9
Fingerprint Mosaics™ for product samples.

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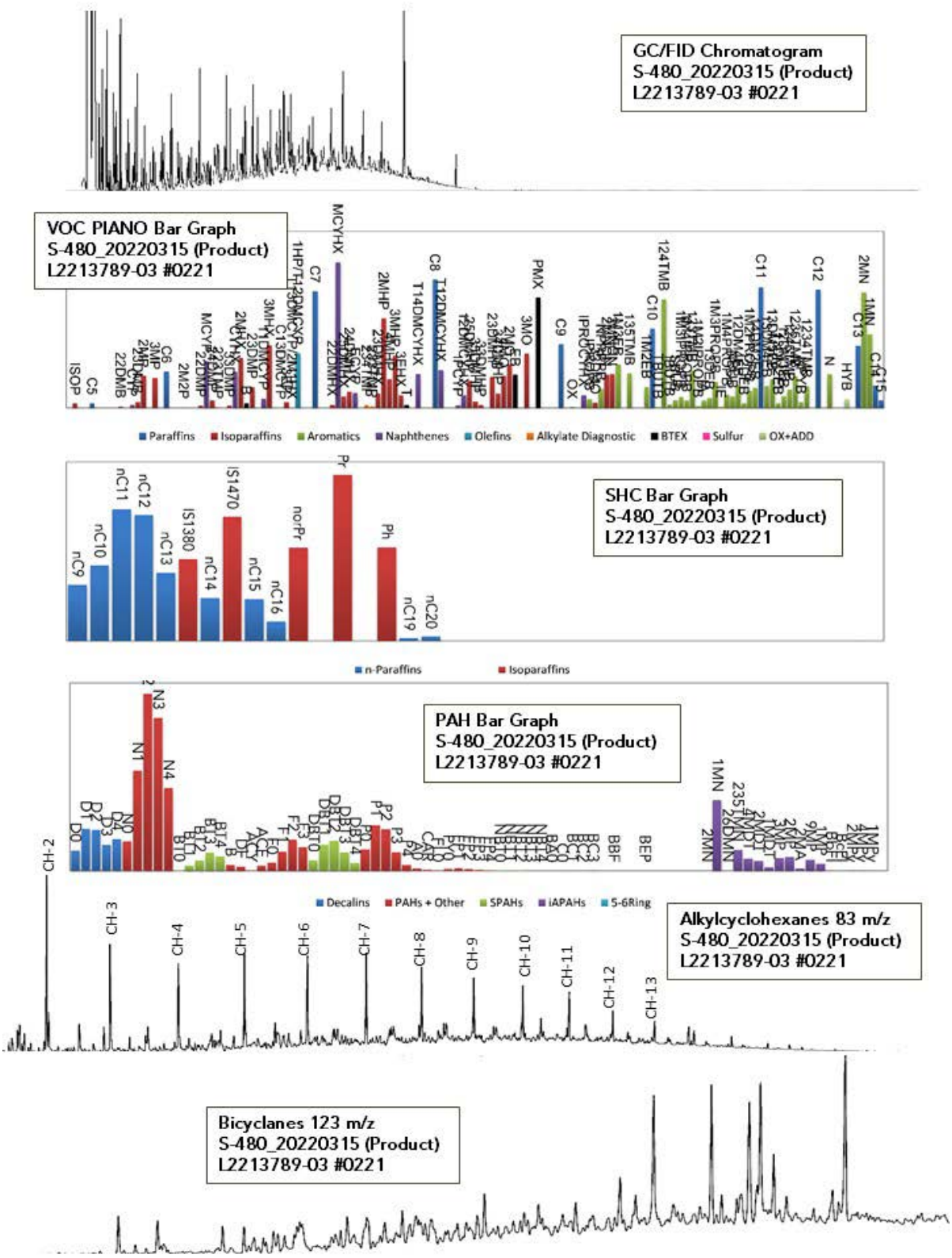


Figure 10 Fingerprint Mosaics™ for product samples.

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Interpreter

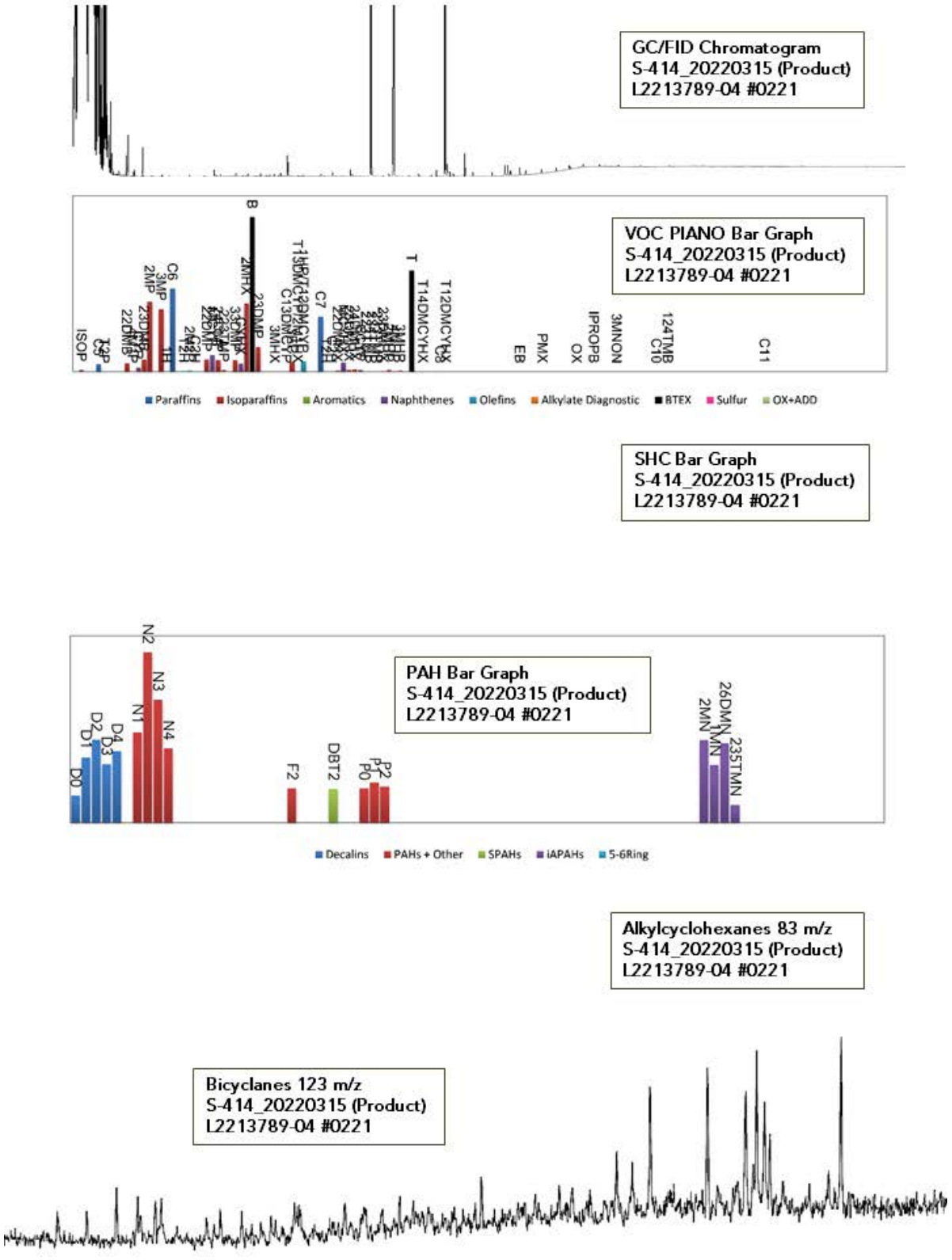


Figure 11 Fingerprint Mosaics™ for product samples.

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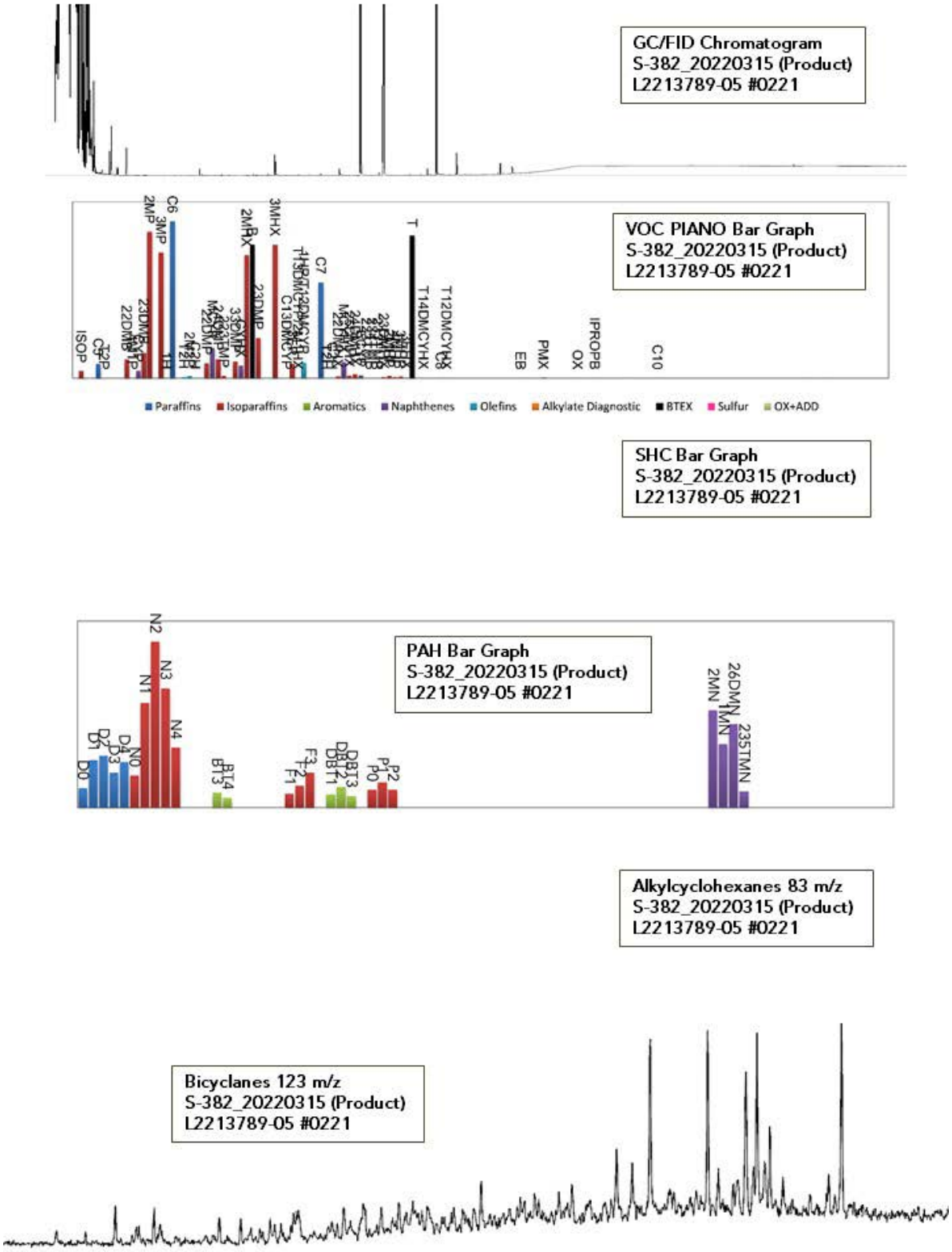


Figure 12 Fingerprint Mosaics™ for product samples.

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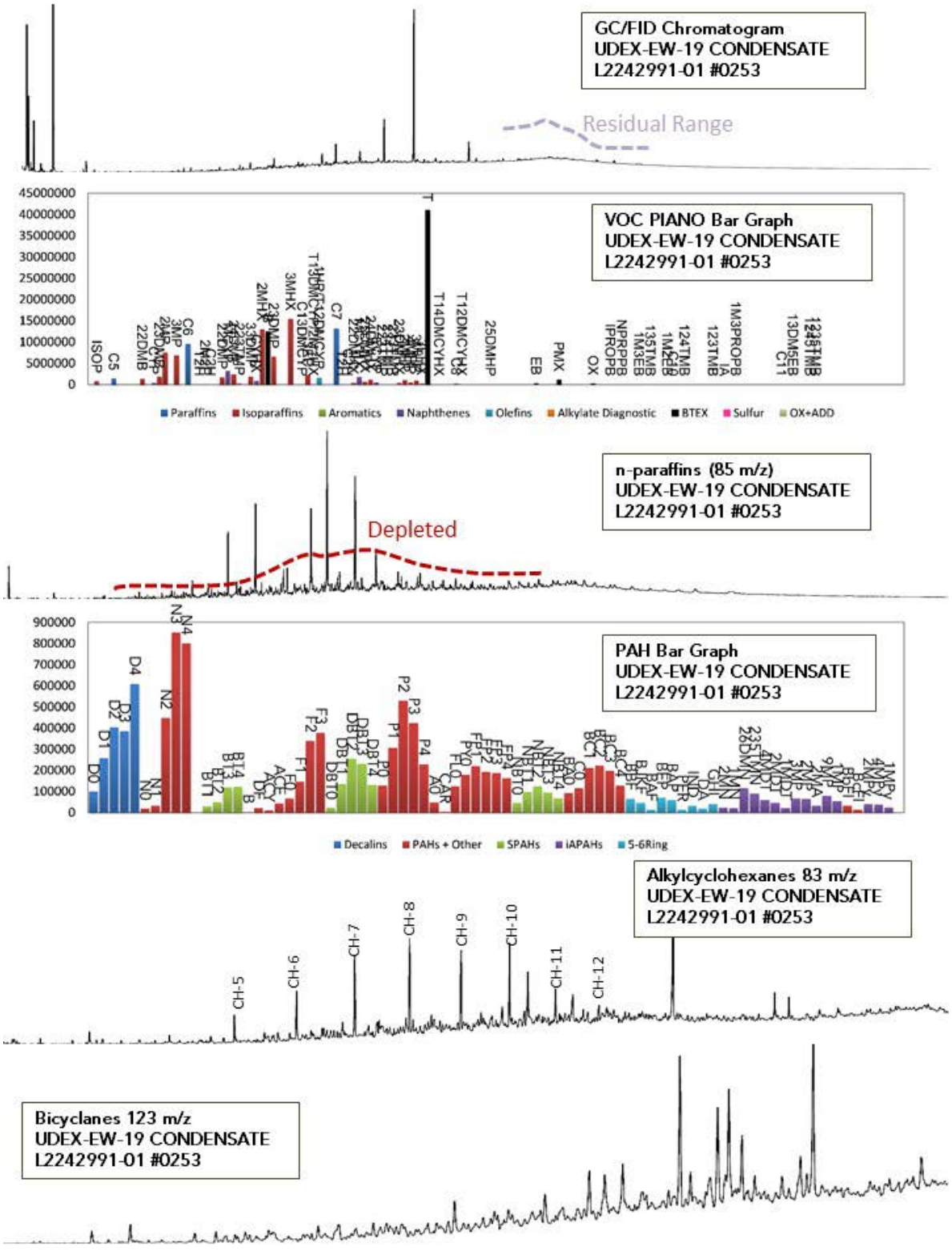


Figure 13 Fingerprint Mosaics™ for product samples.

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Figures

Figures for Addendum #3 – Comparison of S-349 Samples

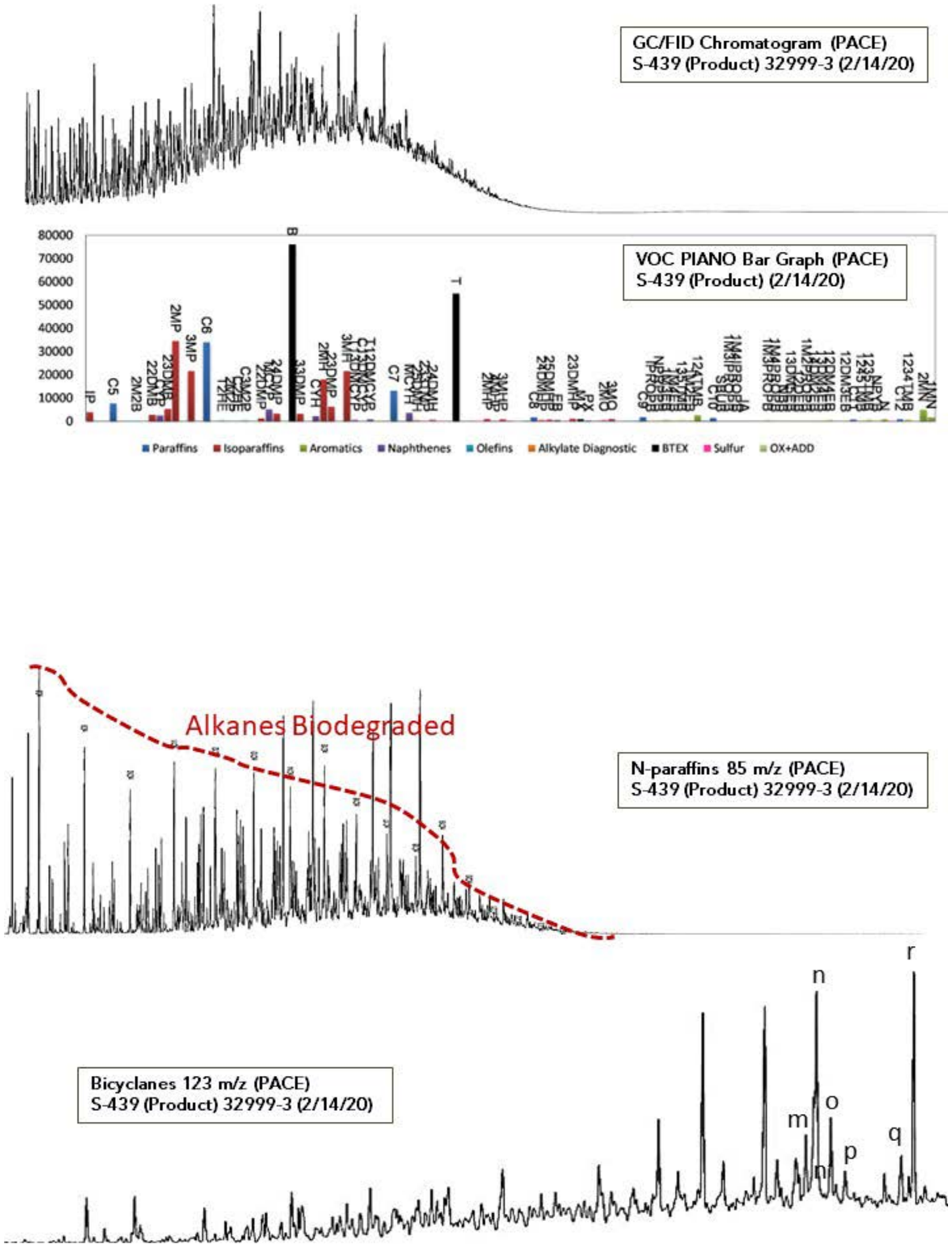


Figure 14. Fingerprint Mosaics™ for product samples (PACE 2020 Sample).

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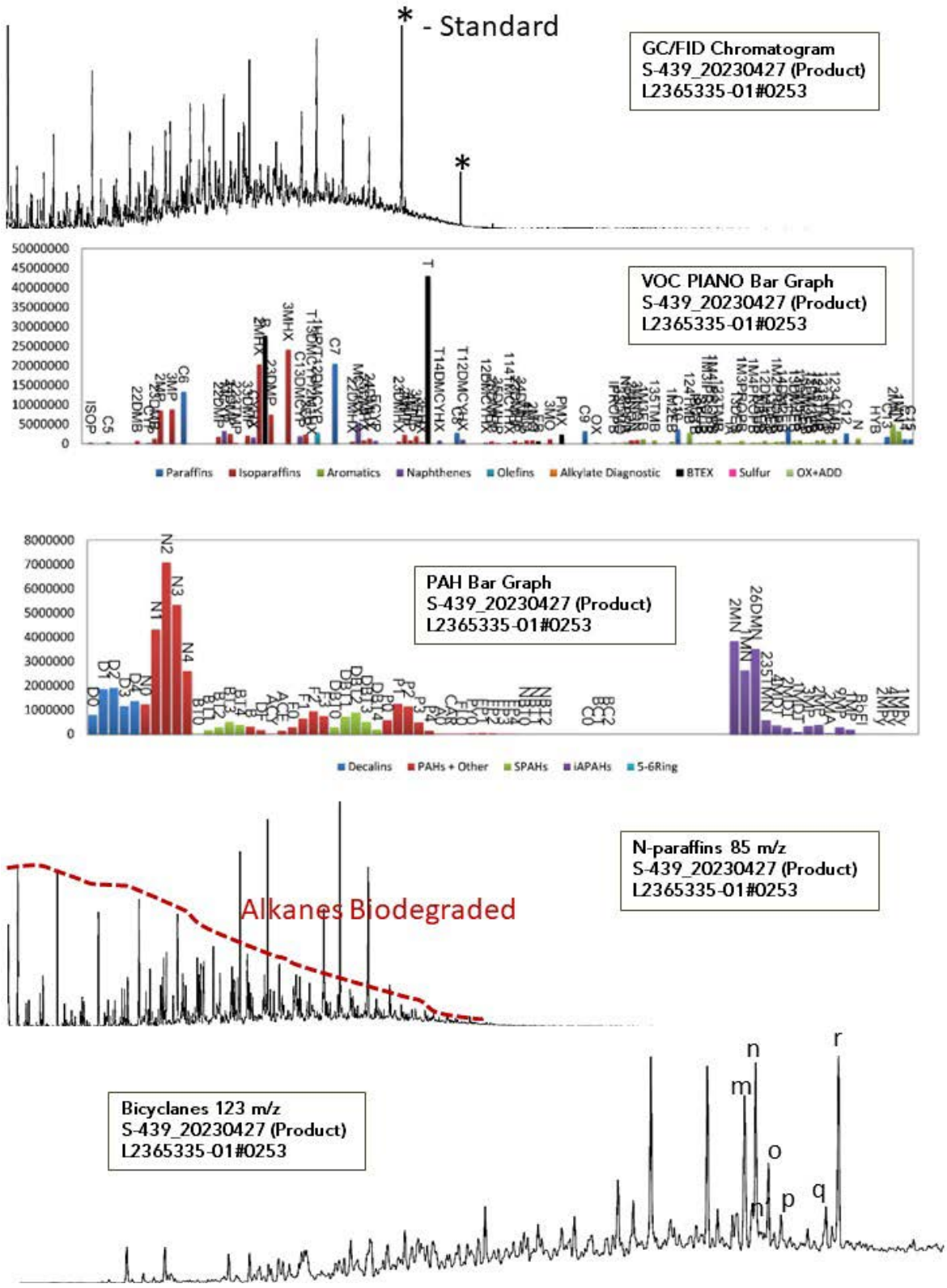


Figure 15. Fingerprint Mosaics™ for product samples.

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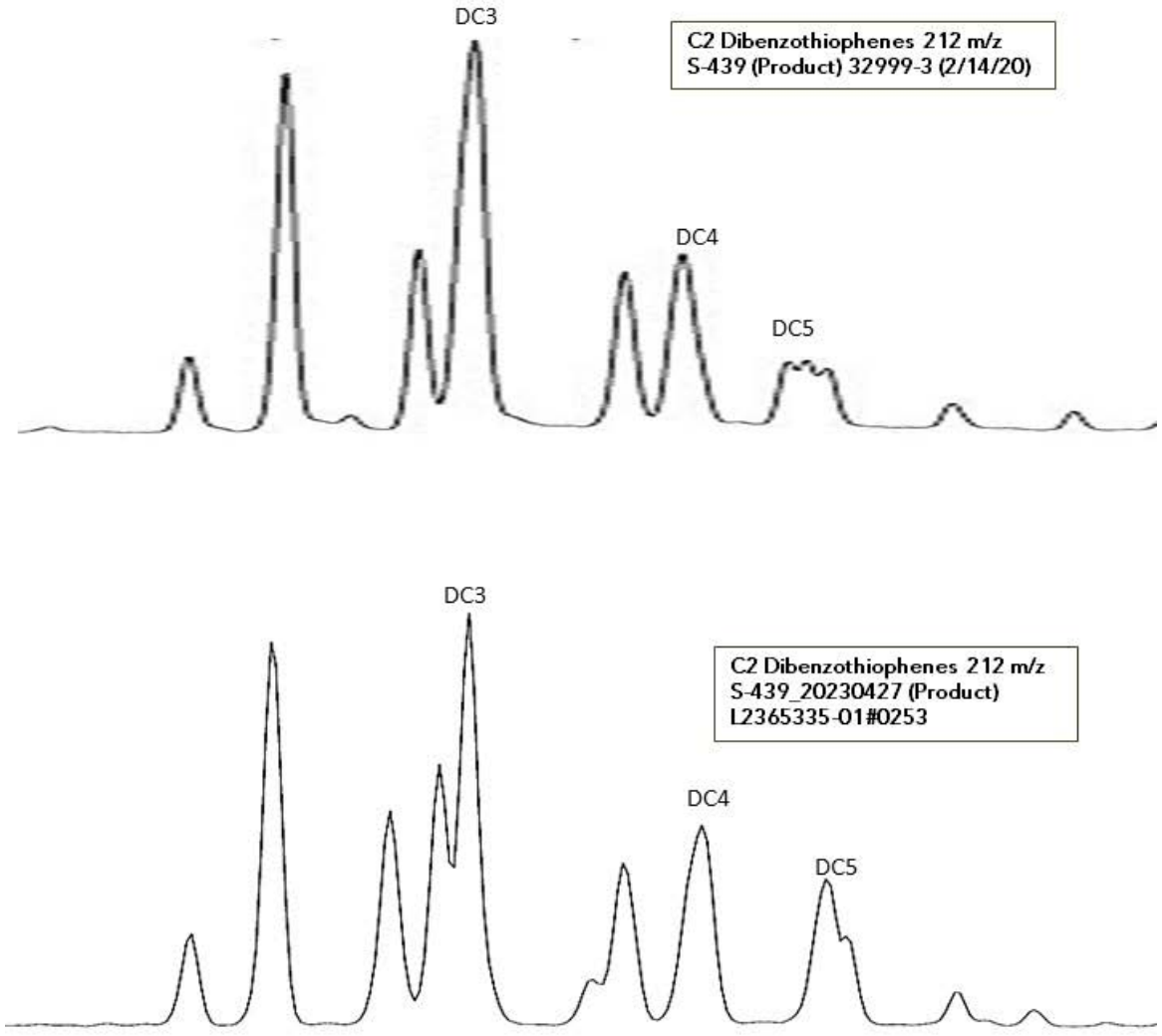


Figure 16. Ion trace fingerprints of C2 Dibenzothiophene isomers (212 m/z).

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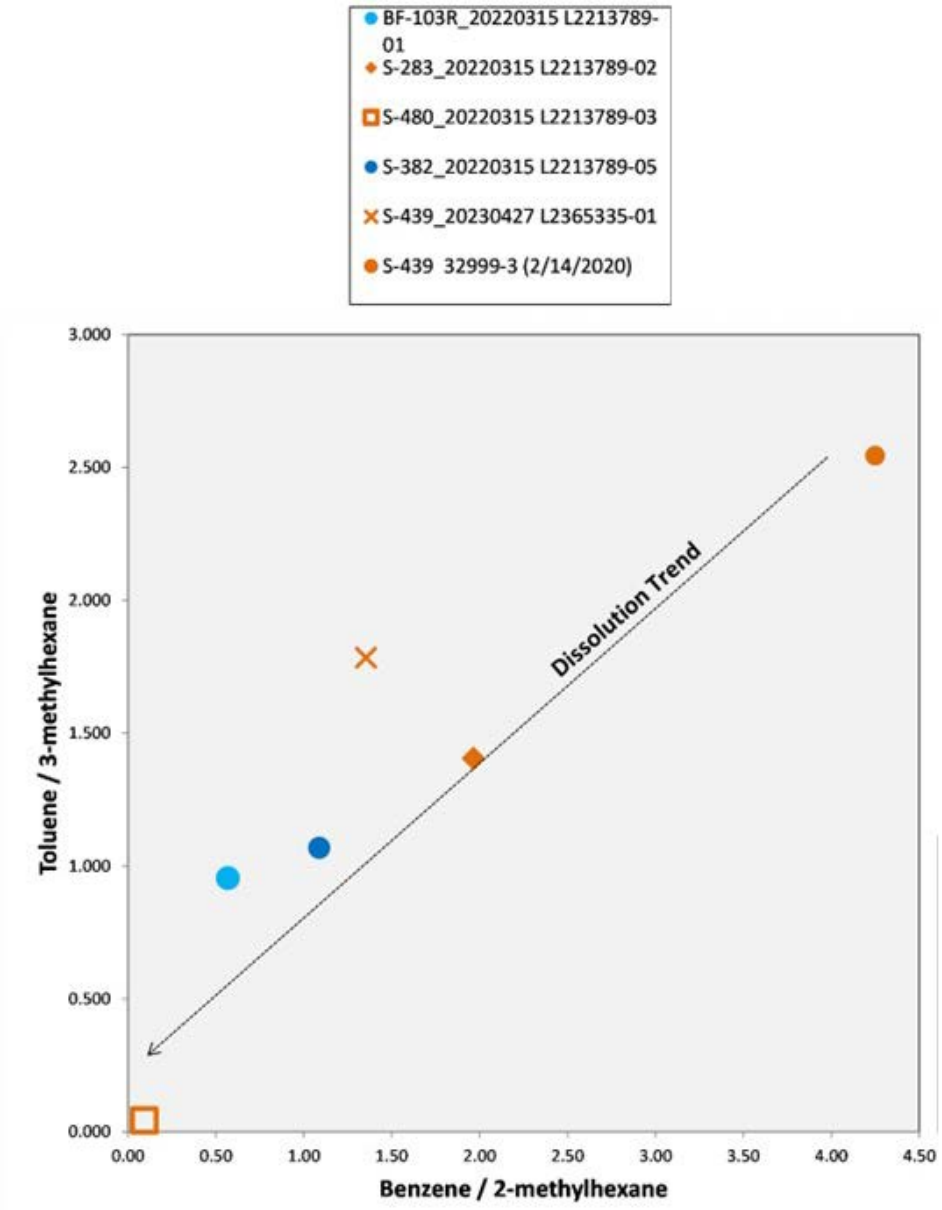


Figure 17. Scatter plot of VOC range dissolution ratios.

Appendix H Aestus ERI Documentation

Meeting Slides
Final Report Stage
UDEX Release Site

Todd Halihan, Ph.D., P.Gp.

Stuart W. McDonald, P.E.

Aestus

Aestus Hosted Web Conference
Friday, July 11, 2025

Stantec

Goals for Working Meeting
Final Report Stage

1. Executive Summary
2. Aestus' CSM+ Process / Electrical Images

3. Client's Project Objectives
4. Supporting Technical CSM Update Discussion

5. Final Report Conclusions/Deliverables

Aestus

Executive Summary: Final Report Stage
Project Objectives

1. Delineate lateral and vertical LNAPL extents
2. Locate high-permeability zones as remediation targets
3. Analyze potential for deeper (~90 ft BGS) plume near bedrock
4. Differentiate site reformate plume (~3-10 years old) from other known jet fuel release to the east (~25+ years old)
5. Assess bioactivity levels based on GeoTrax Survey™ images

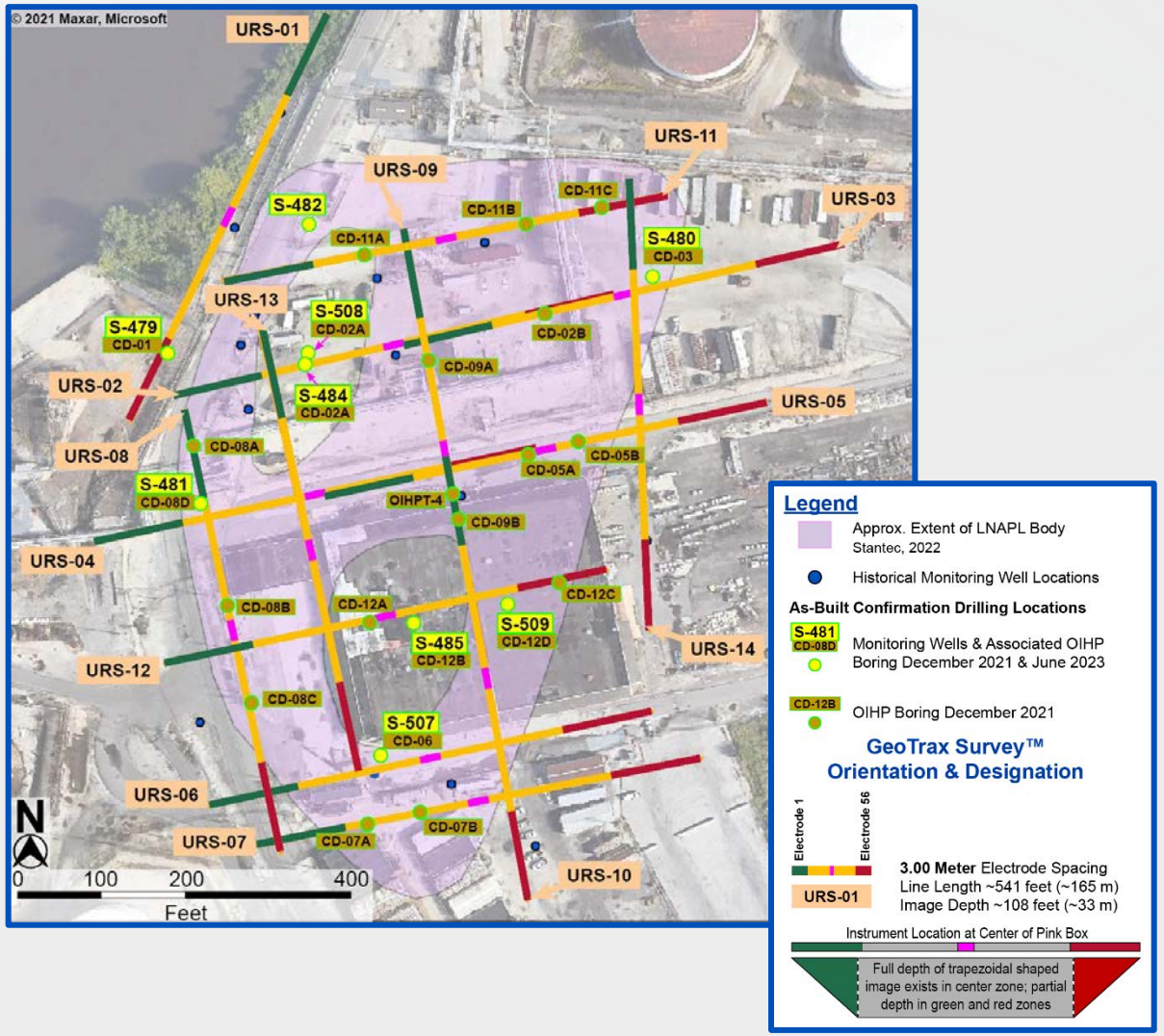
Aestus

Executive Summary: Final Report Stage
CSM+ Process Update

Achievements to date:

- ✓ Historical data in 3D (Step 1)
- ✓ **14 GeoTrax Survey™** lines (Step 2)
- ✓ Interim Report w/ CD picks (Step 3)
- ✓ **26 Targeted CD Locations** (Stantec) (Step 4)
- ✓ Updated CSM+ Conclusions (Step 5)

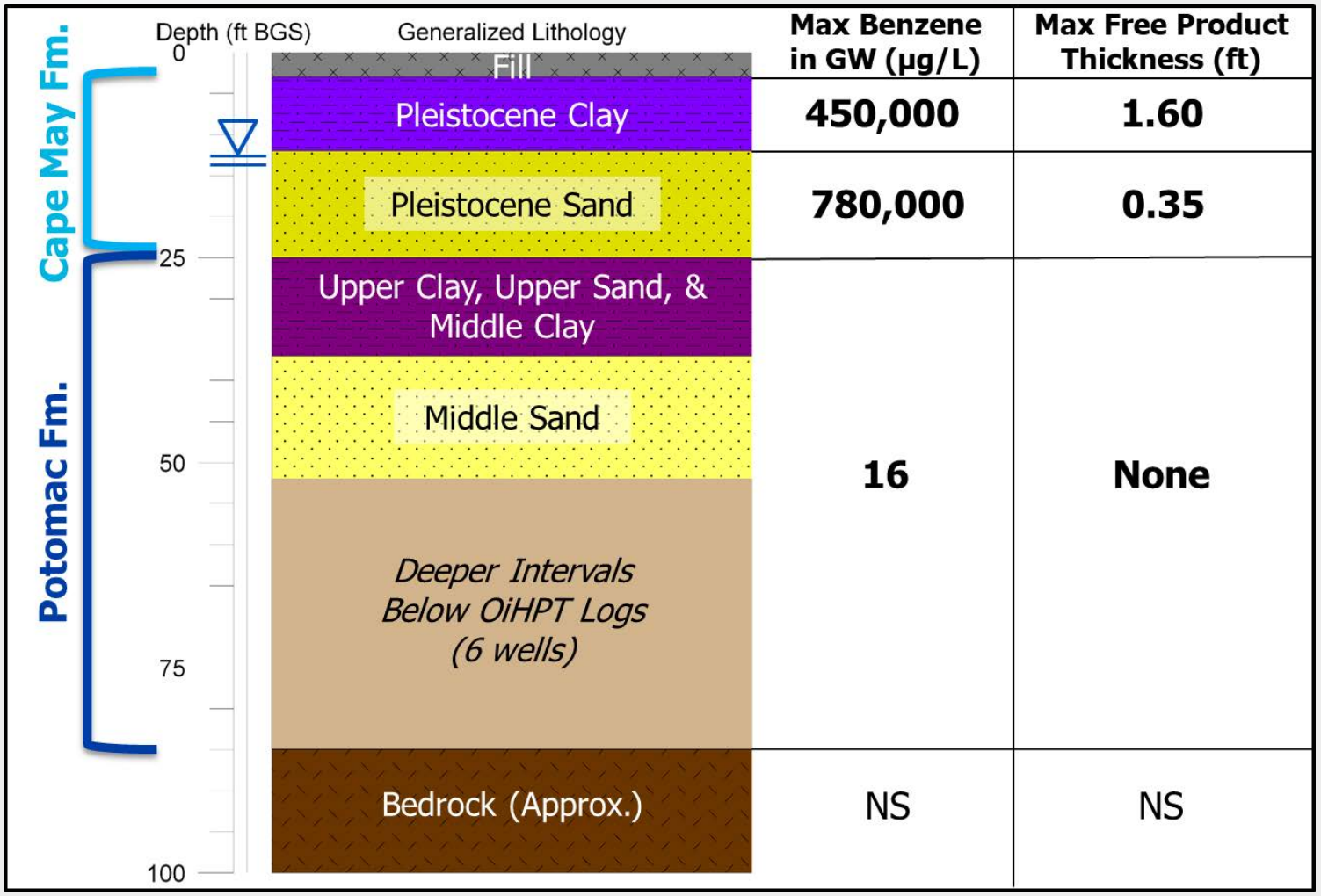
1	2	3	4	5
Data Transfer to Aestus	Ultra-High Resolution Scan	Interim Report (w/Hypotheses)	Confirmation Drilling (by Client)	Final CSM+ Report



Executive Summary: Final Report Stage
Vertical Extent of Impacts

- Lithologic contacts mapped based on confirmation drilling (CD) OiHPT logs and GeoTrax Survey™ resistivity data
- Impacts appear to have concentrated underneath the Pleistocene Clay along water table
  - Relatively minor (≤16 µg/L) impacts within Potomac Formation

July 2023 Sampling Event

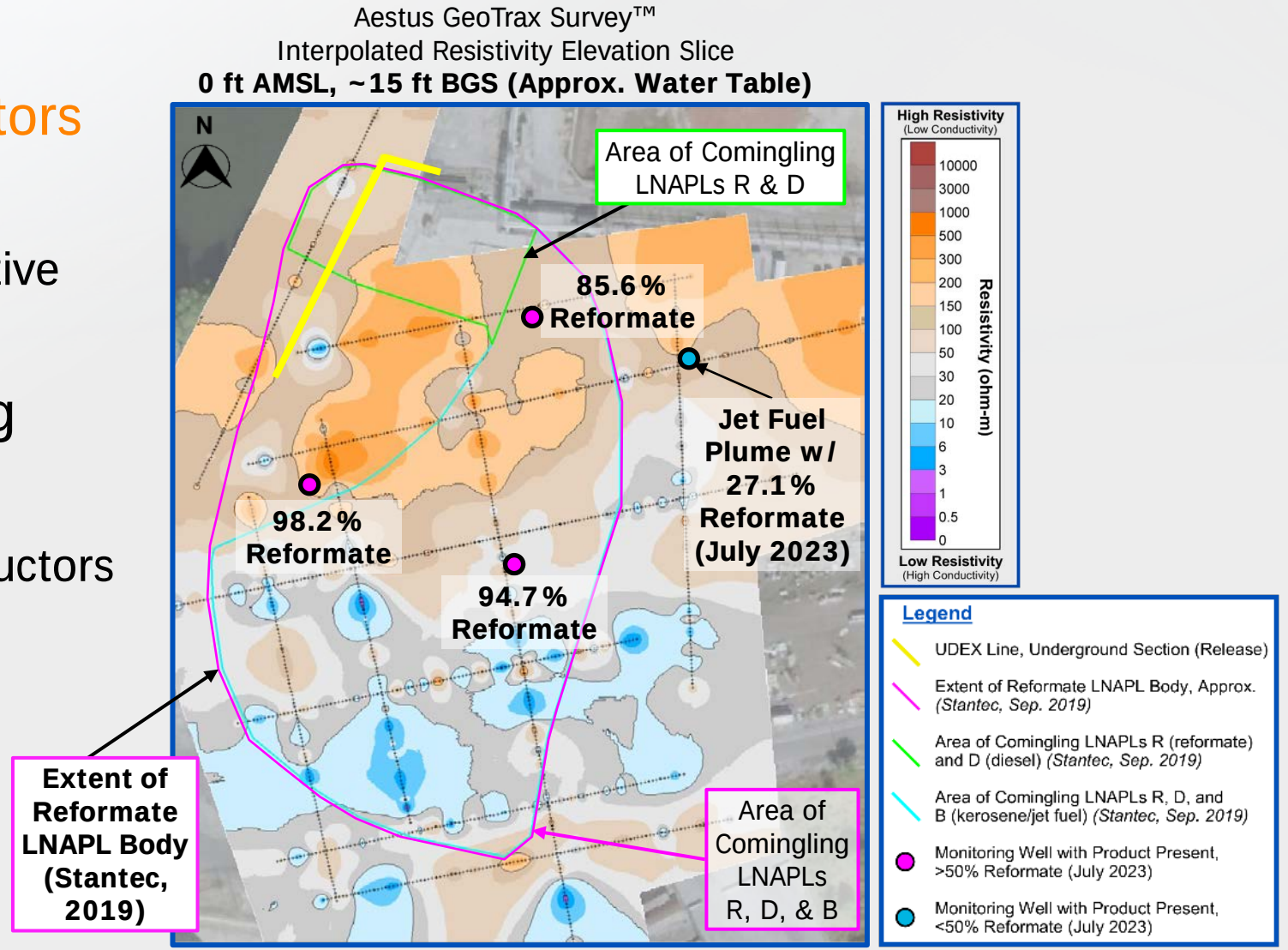


NS = Not Sampled in GeoTrax Survey™ Domain

*Benzene in GW regulatory standard: 5 µg/L

Executive Summary: Final Report Stage Horizontal Extent of Impacts

- Reformate free product corresponds to electrical resistors (~150 – 1000 Ω-m)
  - Older jet fuel is electrically resistive in eastern zone
- Biodegradation appears strong across Site
  - Strong (<3 Ω-m) electrical conductors
  - Elevated GW temps (~18 – 35 °C)
  - Significant biogenic gases (e.g., methane, CO_2)
  - Significant bacterial biomass

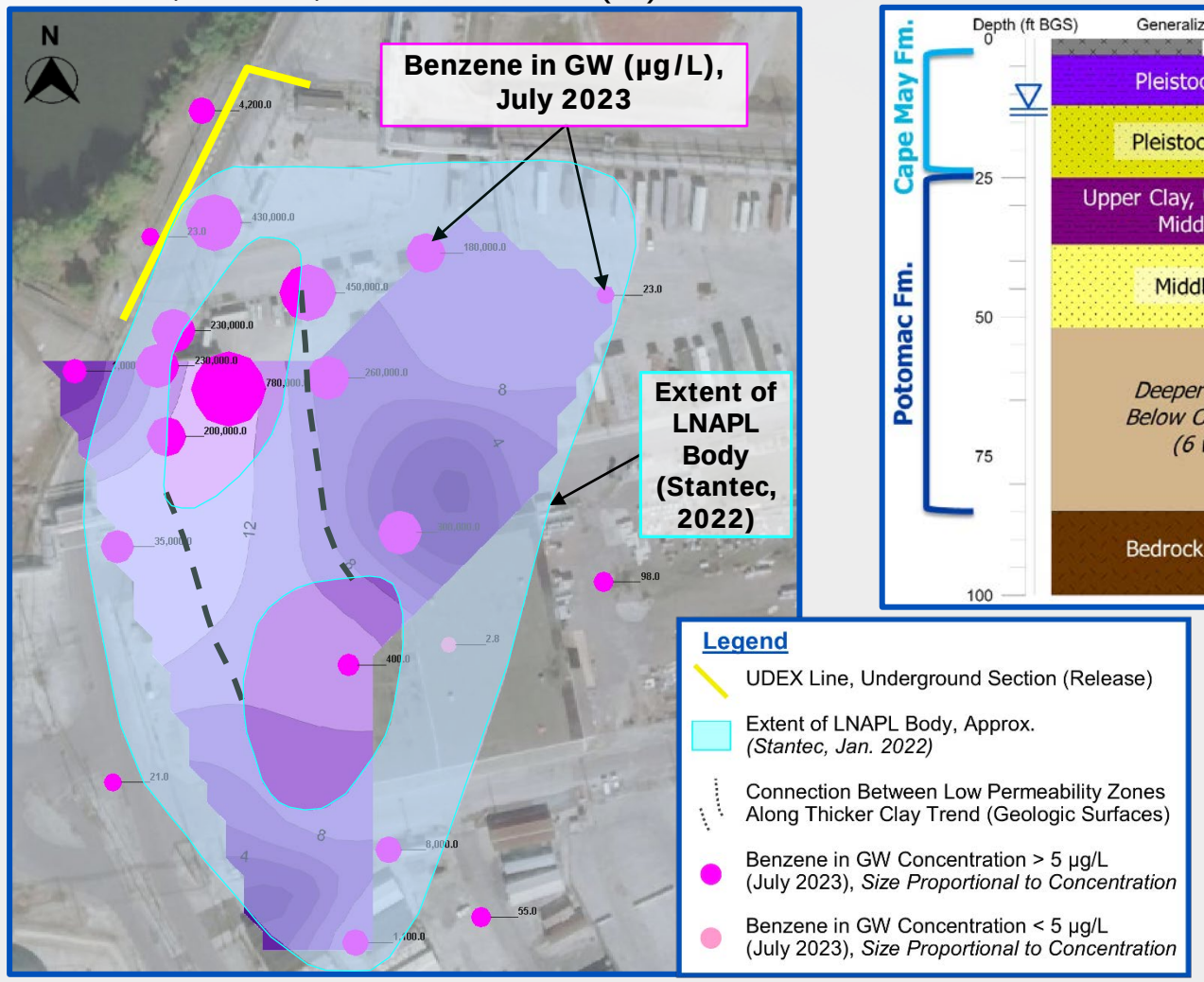


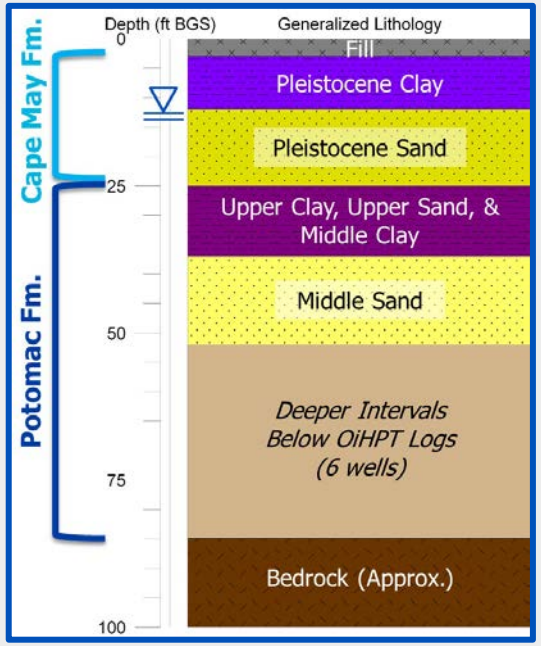
Executive Summary: Final Report Stage Horizontal Extent of Impacts

Thicker clay trend (topographic high in Top of Pleistocene Clay Surface) connecting low permeability zones ("holes") in LNAPL plume (Stantec, 2022)

- Historically minimal free phase LNAPL
- High dissolved phase impacts (780,00 µg/L benzene, July 2023)
- Residual LNAPL may be present

Top of Pleistocene Clay Modeled Surface
Aestus, ft AMSL, Contour Interval (CI): 2 ft

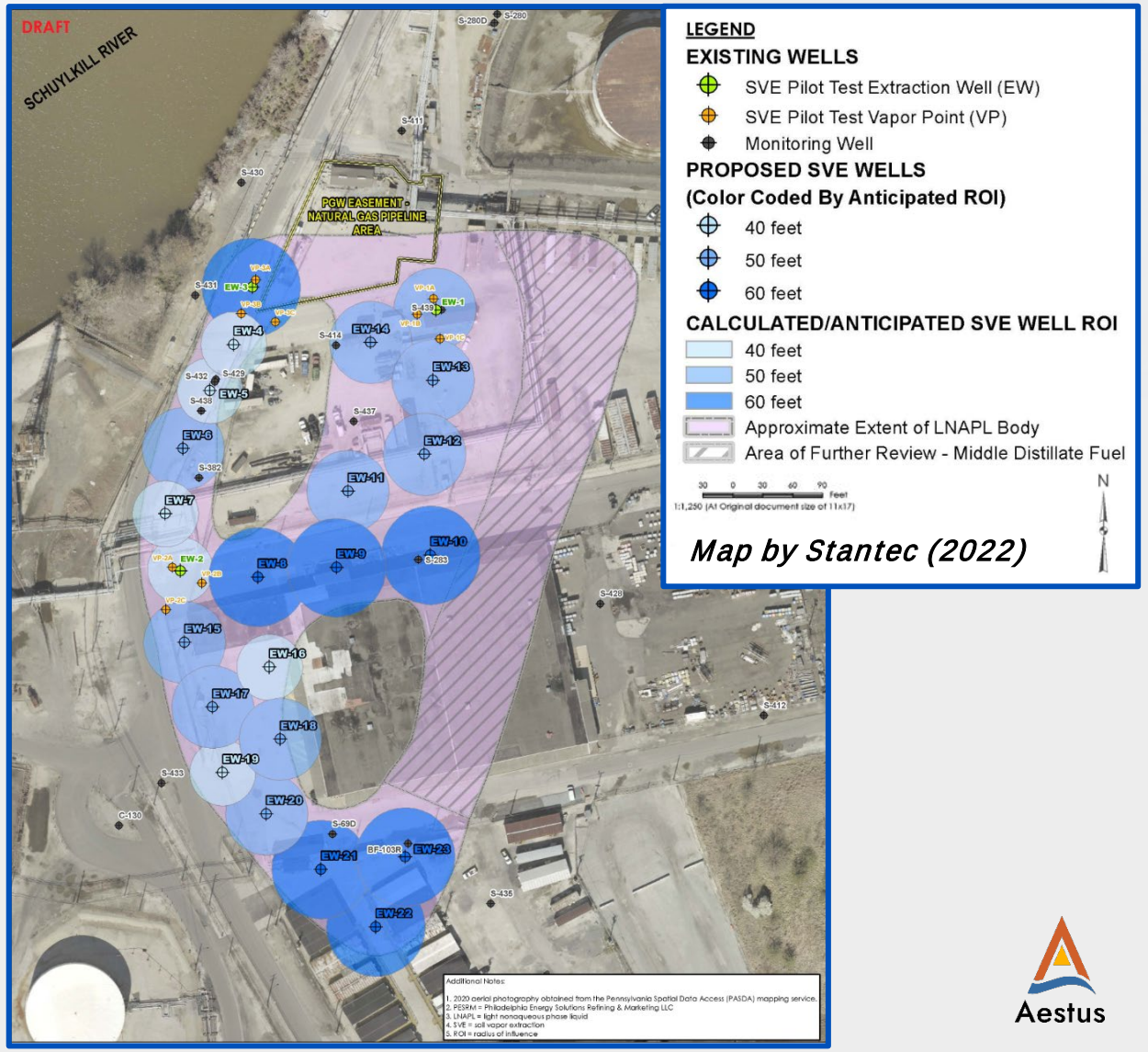




Aestus

Executive Summary: Final Report Stage Remediation Success

- Higher permeability areas identified in CD program successfully targeted with soil vapor extraction (SVE)
  - Performed at 19 extraction wells
  - 2021 – 2023: ~160,666 gallons LNAPL recovered (vapor equivalent)
- Total recovery (all methods) 2018 through 2023: ~257,000 gallons (LNAPL and vapor)



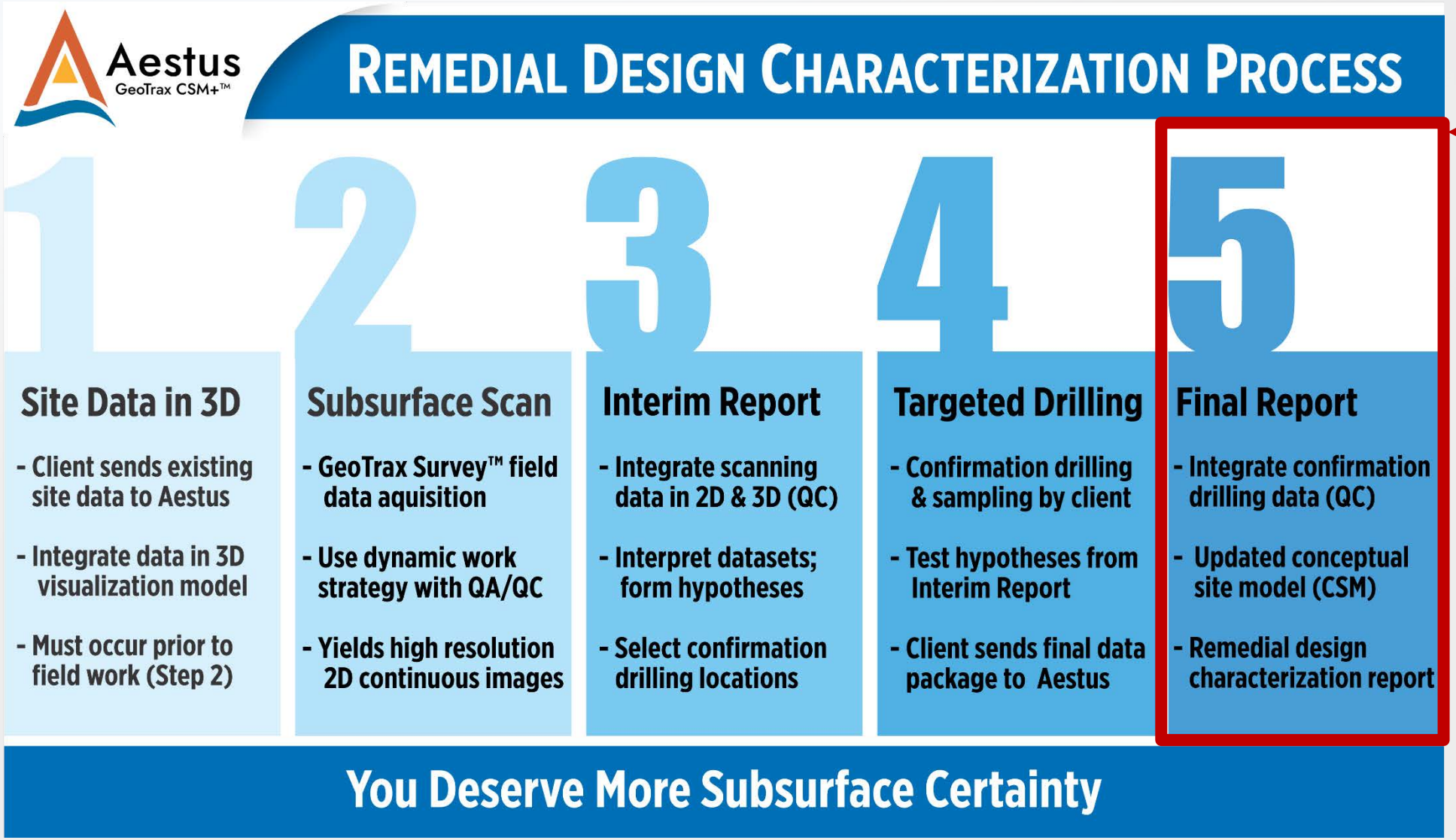
Aestus

Brief Review

CSM Update Process and Interpreting Electrical Imagery

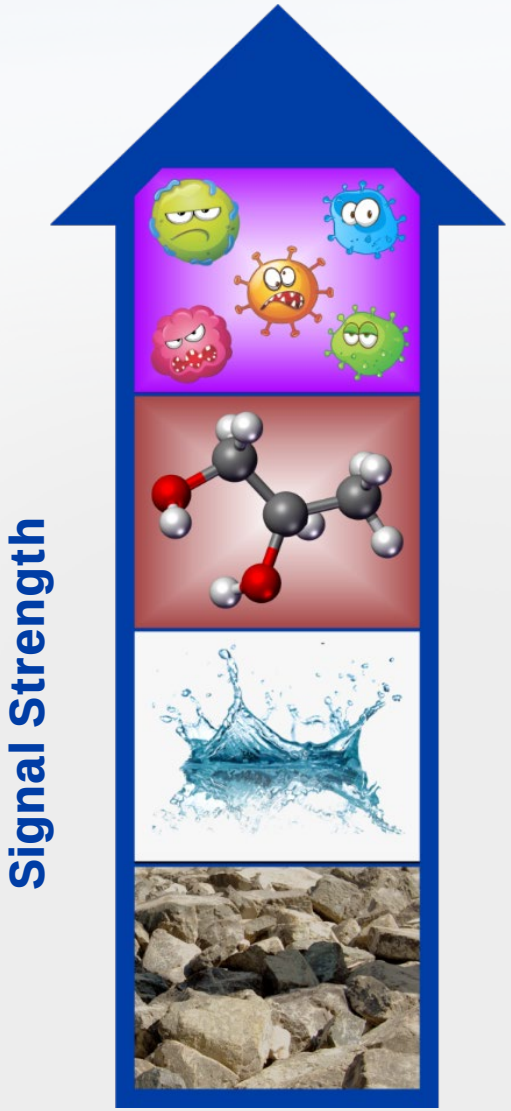
Aestus

Aestus CSM Update Process



We Are Here

What Does Aestus See?



Each data point (pixel) equals the sum of:

1. Biological activity
2. Contamination/ Injectates/etc.
3. Groundwater/Fluids
4. Soil and rocks

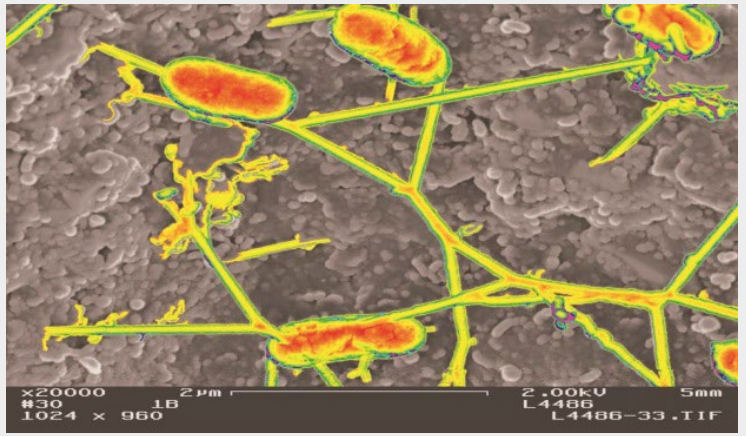
Aestus

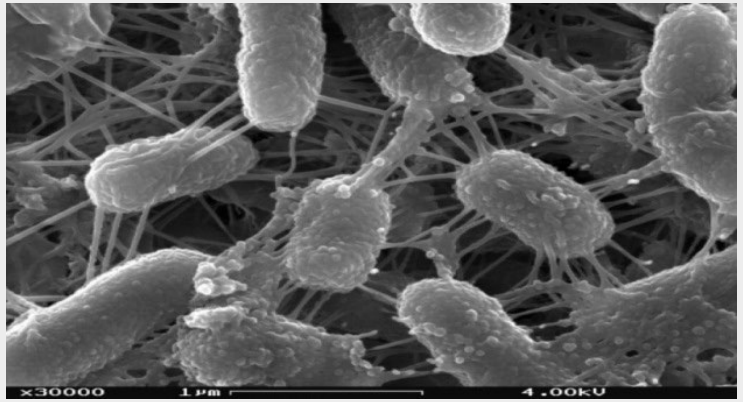
Reason for Bioactivity Detection

"Nanowires"

(Electron Microscopy)

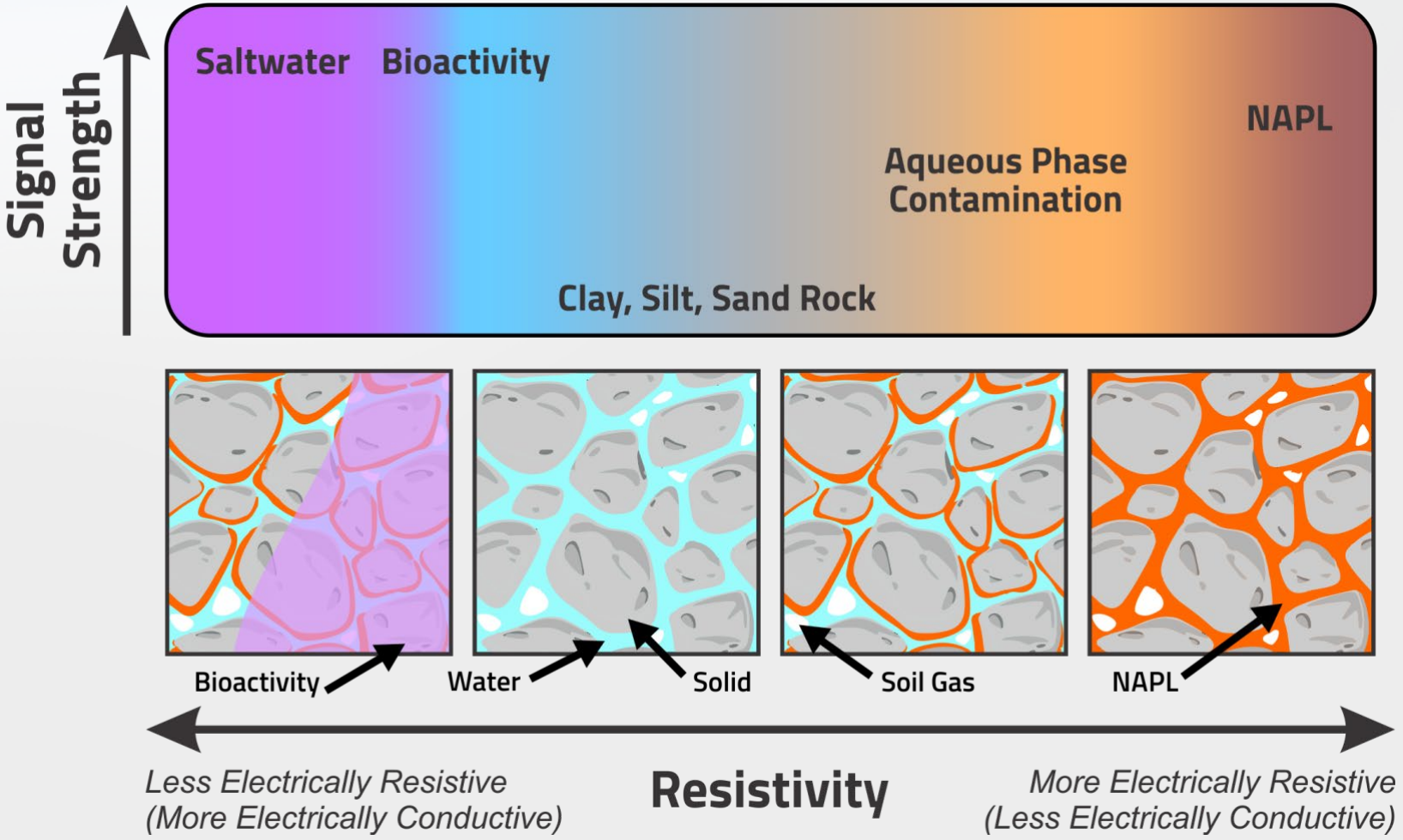






Aestus

Typical Electrical Properties



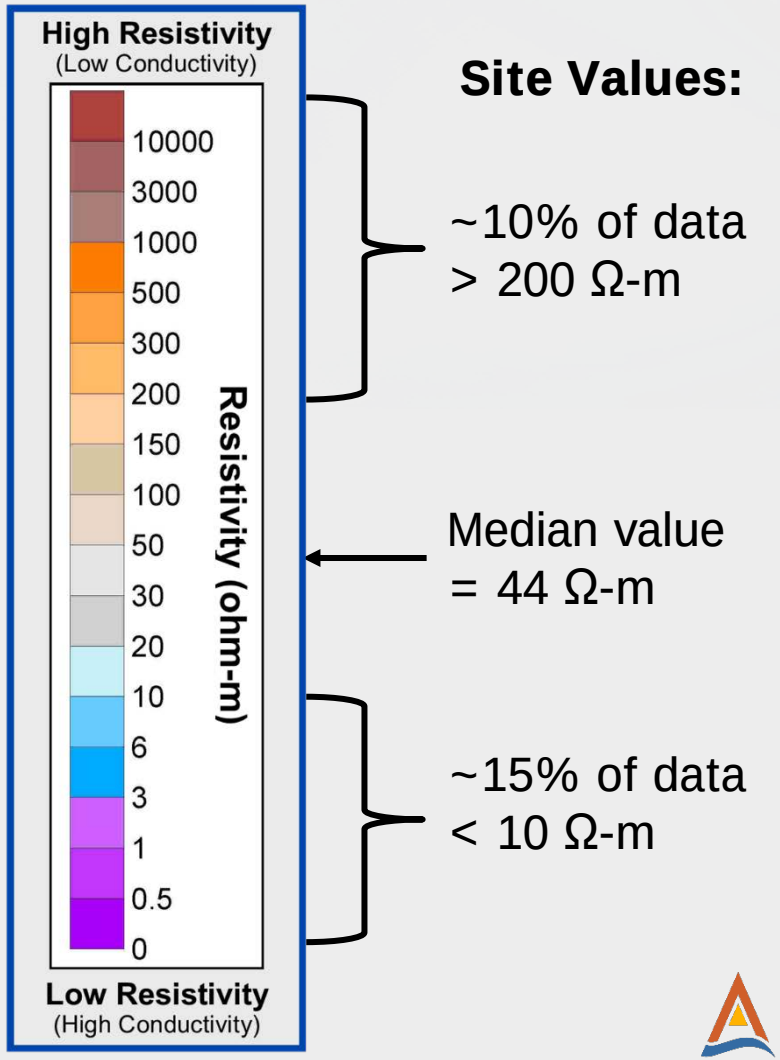
Mowder, 2019

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Site Electrical Properties
UDEX Release Site

- **Typical** resistivity values at impacted sites:
  - Unweathered: expect zones >250 Ω-m (resistive)
  - Weathered: expect zones <10 Ω-m (conductive)

- **Site** electrical resistivity values:
  - Typical of fine-grained media, LNAPL impacts, microbial activity, and possible biogenic gases
  - 10% of data > 200 Ω-m
  - Median = ~~44~~ Ω-m
  - 15% of data < 10 Ω-m



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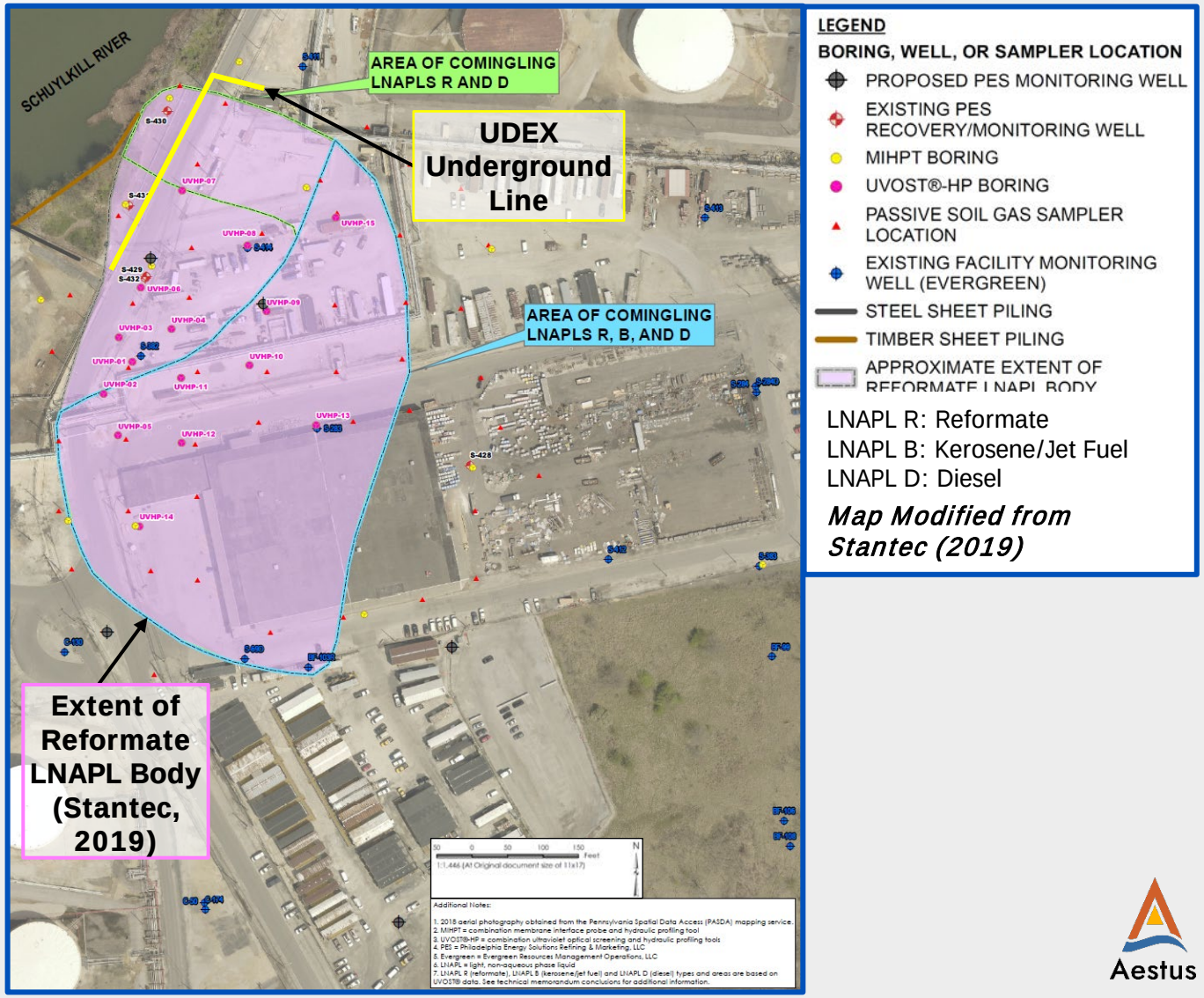
ANY QUESTIONS ON INTERPRETING ELECTRICAL SIGNATURES?

Up Next: Detailed Site Discussion

Aestus

Pre-Aestus Data Summary
UDEX Release Site

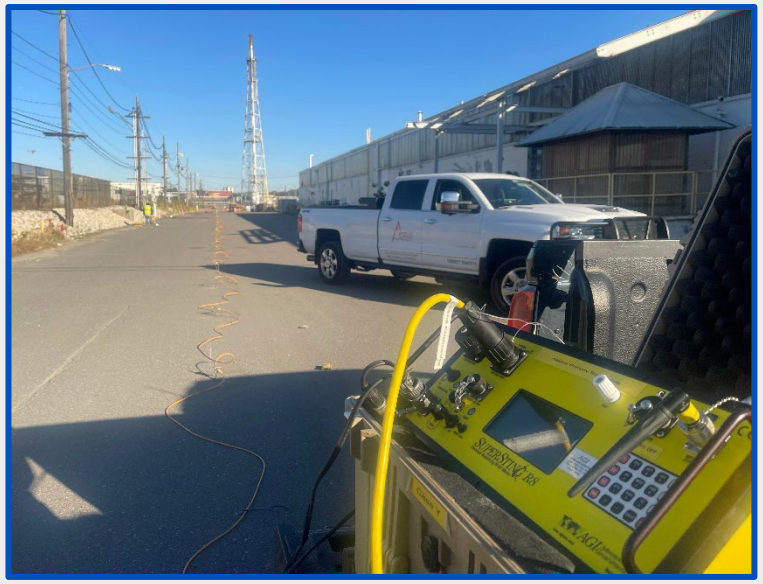
- 2018: Underground UDEX line release discovered (reformate)
  - Line depth: 4-5 ft BGS;
    Section length: ~375 ft
- Initial release volume estimate: ~200,000 – 400,000 gallons
- Comingling LNAPLs
- Characterization prior to GeoTrax Survey™:
  MiHPTs, passive soil gas survey, UVOST investigation, petroleum forensics, GW/soil sampling



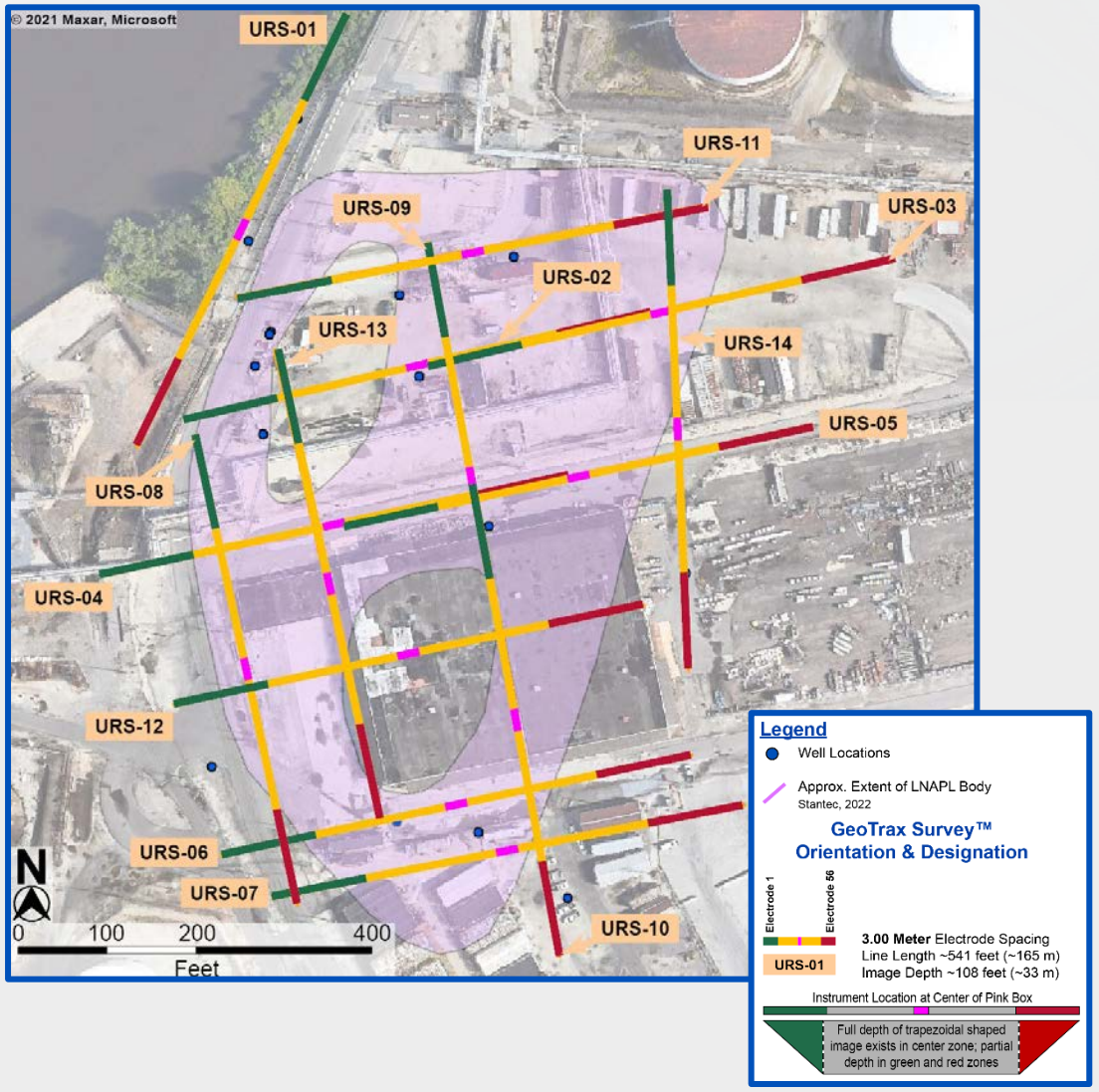
Aestus

GeoTrax Survey™ Field Data Acquisition

- Field work completed November 2021
- 14 GeoTrax Surveys™ performed
  - 4 surveys collected partially indoors



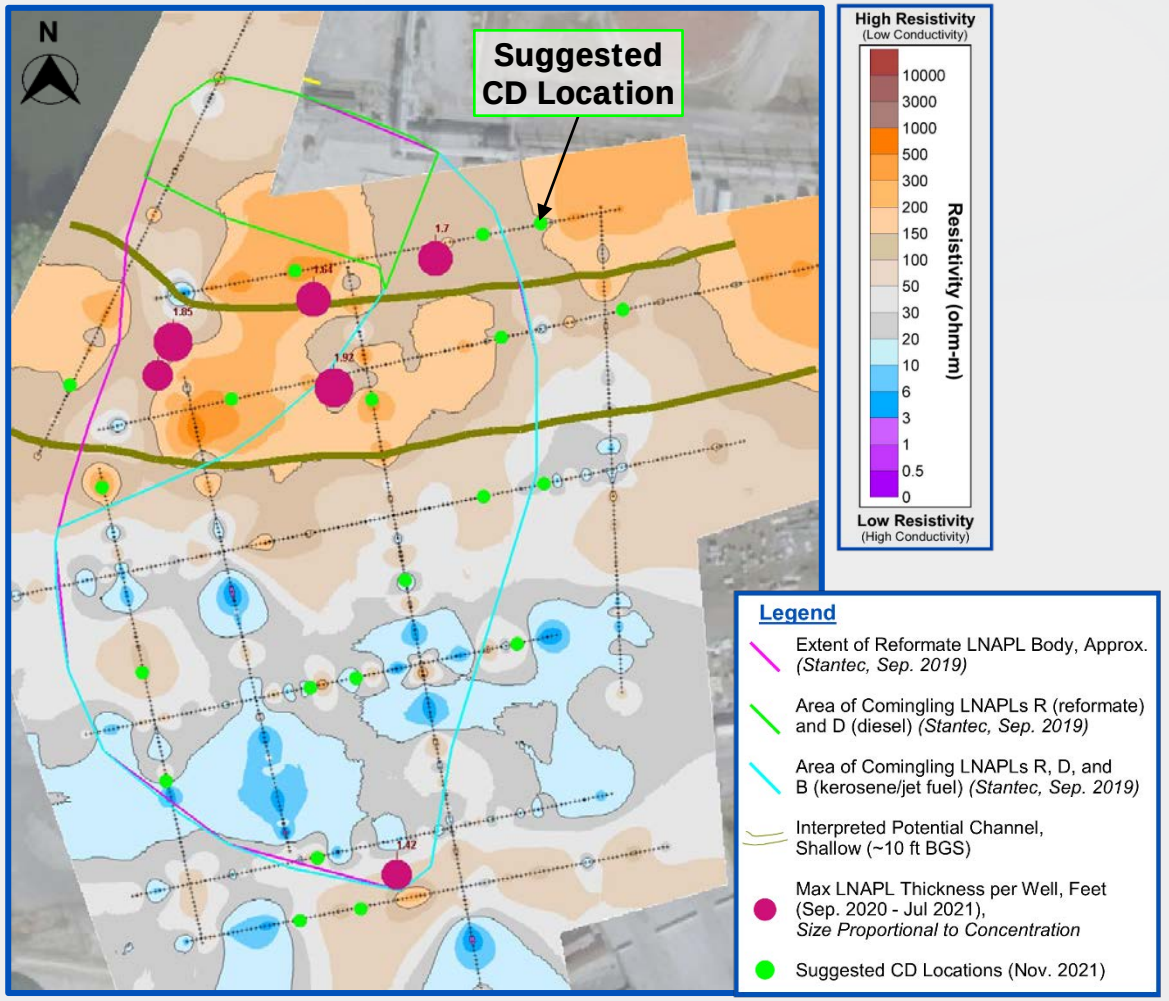




Interim Report Recap Submitted November 2021

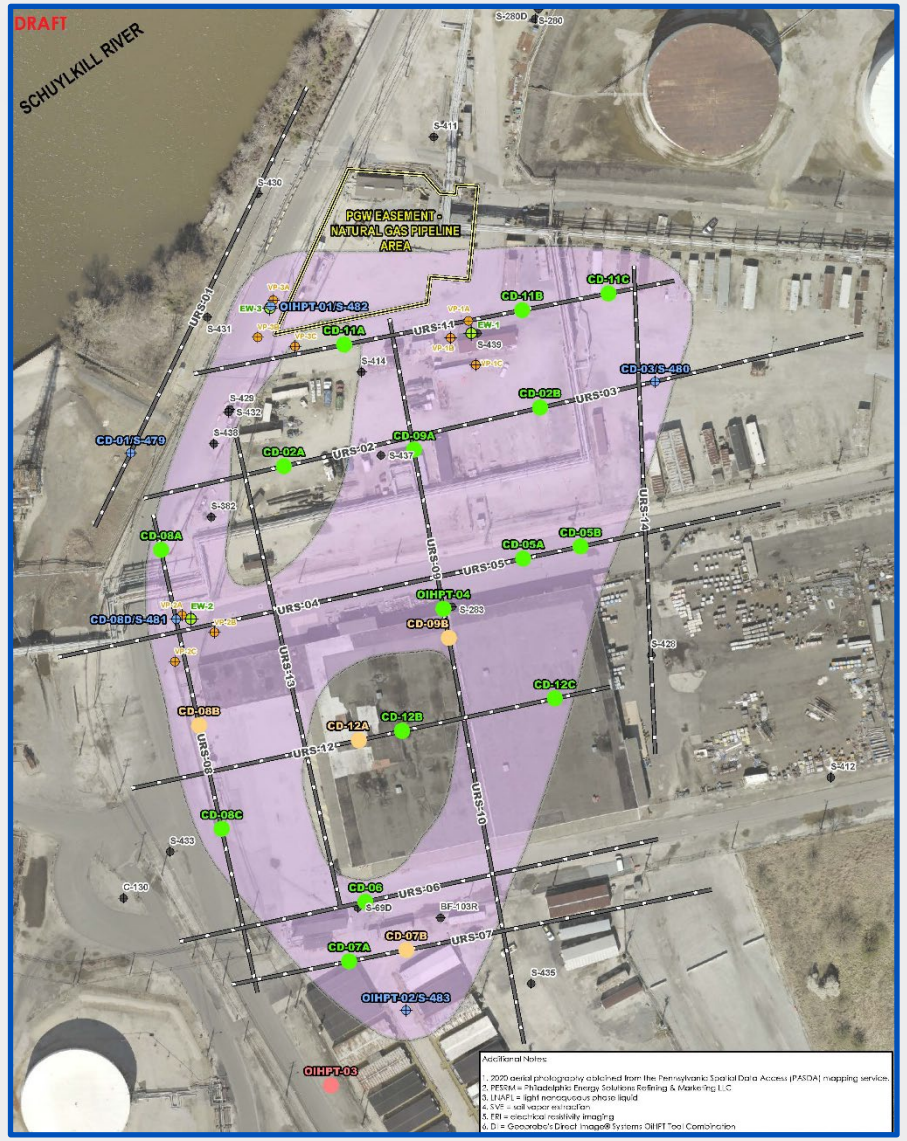
- Reformate plume in electrical resistivity range of ~150-1000 Ω-m
- Potential channels identified at range of depths from ~10 ft AMSL (surface) to ~60 ft AMSL controlling plume migration
- Bioactivity appears strong on Site
- 20 priority-ranked suggested CD locations to:
  - Confirm flowpaths (assess potential channels)
  - Determined by 2021-2023 CD program not to be channel structures
  - Delineate plume extents

Aestus GeoTrax Survey™
Interpolated Resistivity Elevation Slice
0 ft AMSL, ~15 ft BGS (Approx. GW Table)



Summary of Integrated CD Data

- 26 confirmation drilling (CD) locations
  - 15/26 borings completed (OiHPT); 4/15 hit refusal ~10 – 20 ft BGS
  - 10/26 converted to monitoring wells (sampled/gauged)
  - 1/26 not completed (possible utility)
- 16 existing wells sampled/gauged
- Data integrated in 2D & 3D



LEGEND

EXISTING WELLS

- SVE Pilot Test Extraction Well (EW)
- SVE Pilot Test Vapor Point (VP)
- Monitoring Well

AESTUS GEOTRAX SURVEY™ LOCATIONS

- ERI Profile

CONFIRMATION DRILLING LOCATIONS

- DI Boring Completed - Well Installed
- DI Boring Completed
- DI Boring Completed - Refusal Encountered
- DI Boring Not Completed - Possible Utility
- Approximate Extent of LNAPL Body

N

30 0 30 60 90 Feet
1:1,250 (At Original document size of 11x17)

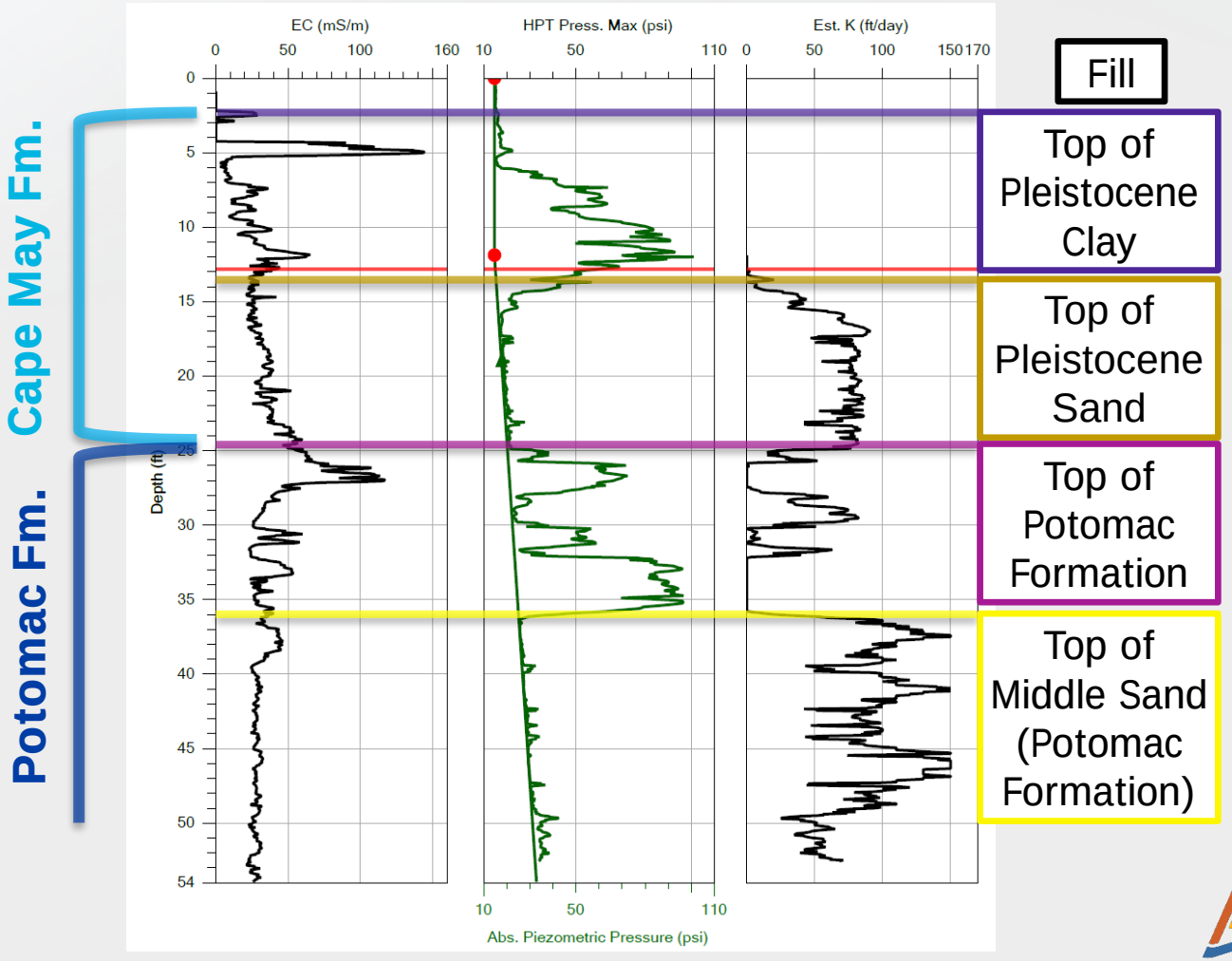
Map by Stantec (2022)

Geology CSM
Site Lithologic Units

OIHPT logs from CD borings used to identify and map lithologic unit surfaces observable in GeoTrax Survey™ data

- Correlated to CD boring logs
- Nomenclature from existing Site cross sections (Stantec, 2018)
- Potomac Fm. above Middle Sand Unit contains Upper Clay, Upper Sand, and Upper Clay Units (not identifiable on GeoTrax Survey™)

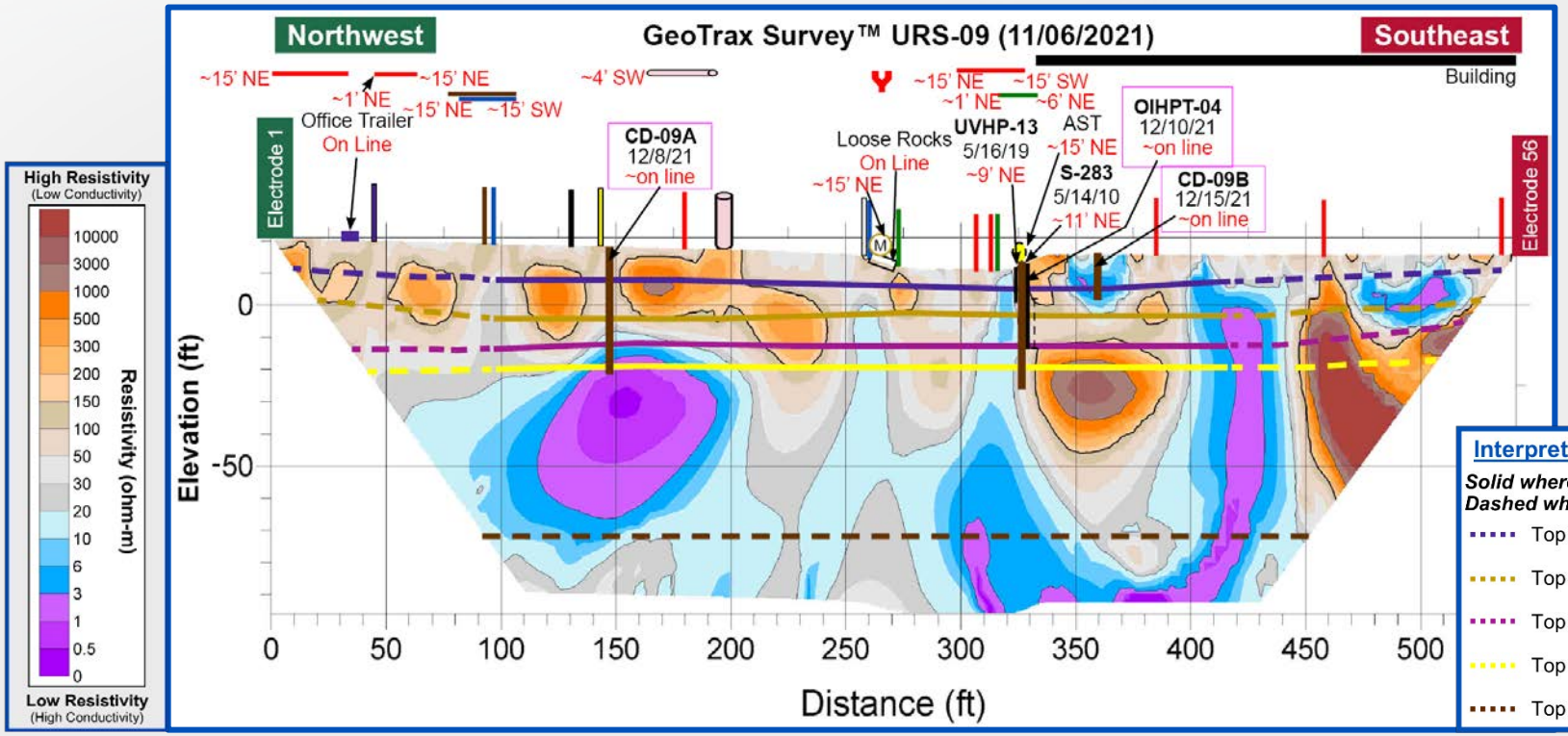
Type Log: CD-06



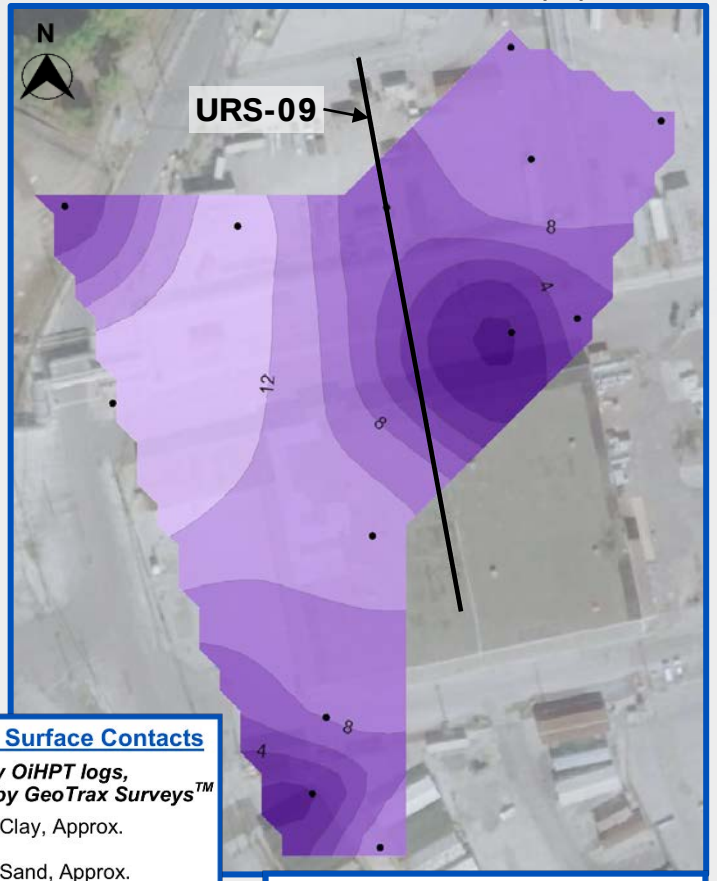
Aestus

Geology CSM
Site Lithology in Electrical Imagery

- Lithologic unit surfaces (solid lines) further informed by GeoTrax Survey™ electrical imagery (dashed)
- Top of bedrock surface described by Stantec (2017) at ~70 – 85 ft BGS identifiable in electrical imagery



Top of Pleistocene Clay Modeled Surface
Aestus, ft AMSL, Contour Interval (CI): 2 ft



Interpreted Geologic Surface Contacts
Solid where controlled by OiHPT logs, Dashed where informed by GeoTrax Surveys™
- Top of Pleistocene Clay, Approx.
- Top of Pleistocene Sand, Approx.
- Top of Potomac Formation, Approx.
- Top of Middle Sand Unit, Approx.
- Top of Bedrock, Approx.

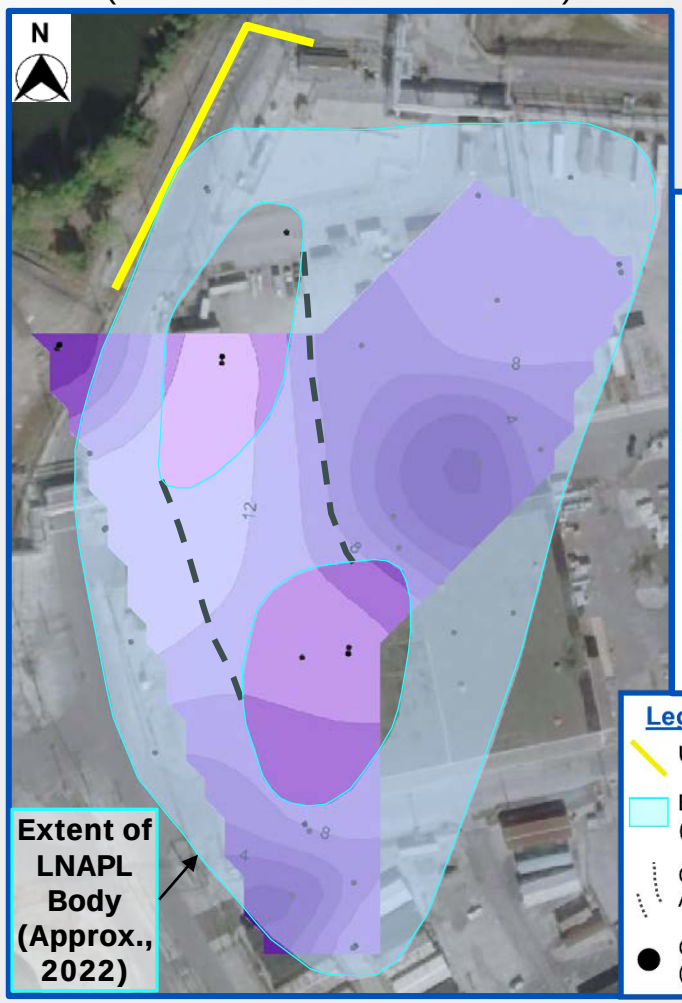
Legend
- Geologic Surface Modeling Points (CD Boring OiHPT Logs)

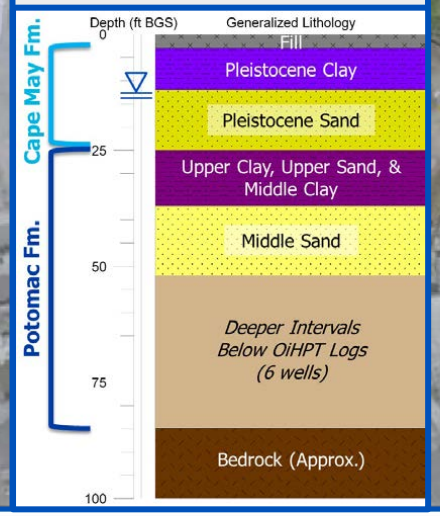
Geology CSM
Low Permeability Zone

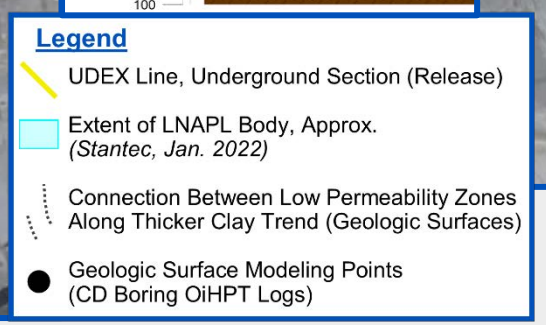
Topographic high in top of Pleistocene Clay surface supports presence of low permeability zones ("holes") in LNAPL distribution

- Thicker clay trend coincident with lower elevation of top of Pleistocene Sand
- Supports connection (grey dash) between low permeability zones

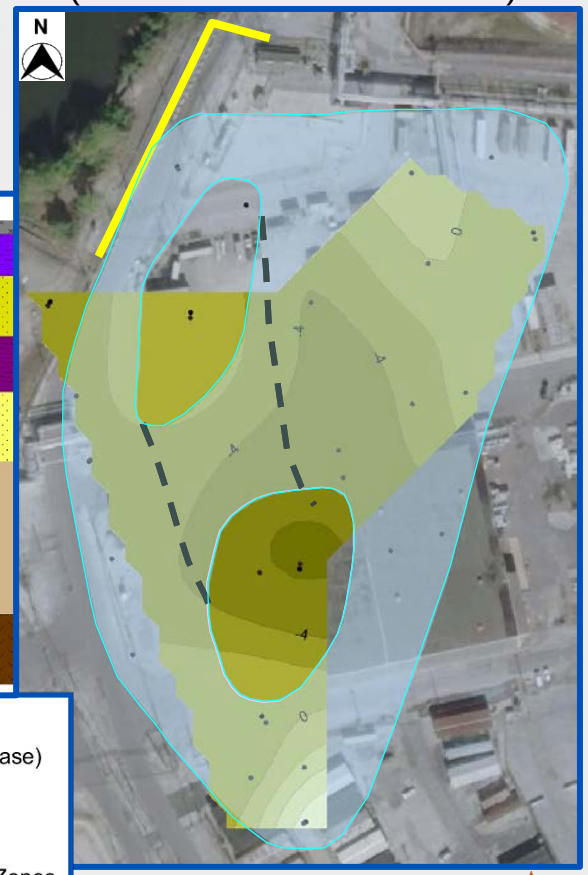
Top of Pleistocene Clay Modeled Surface
Aestus, ft AMSL, CI: 2 ft
(3 – 13 ft BGS/~-1 – 14 ft AMSL)







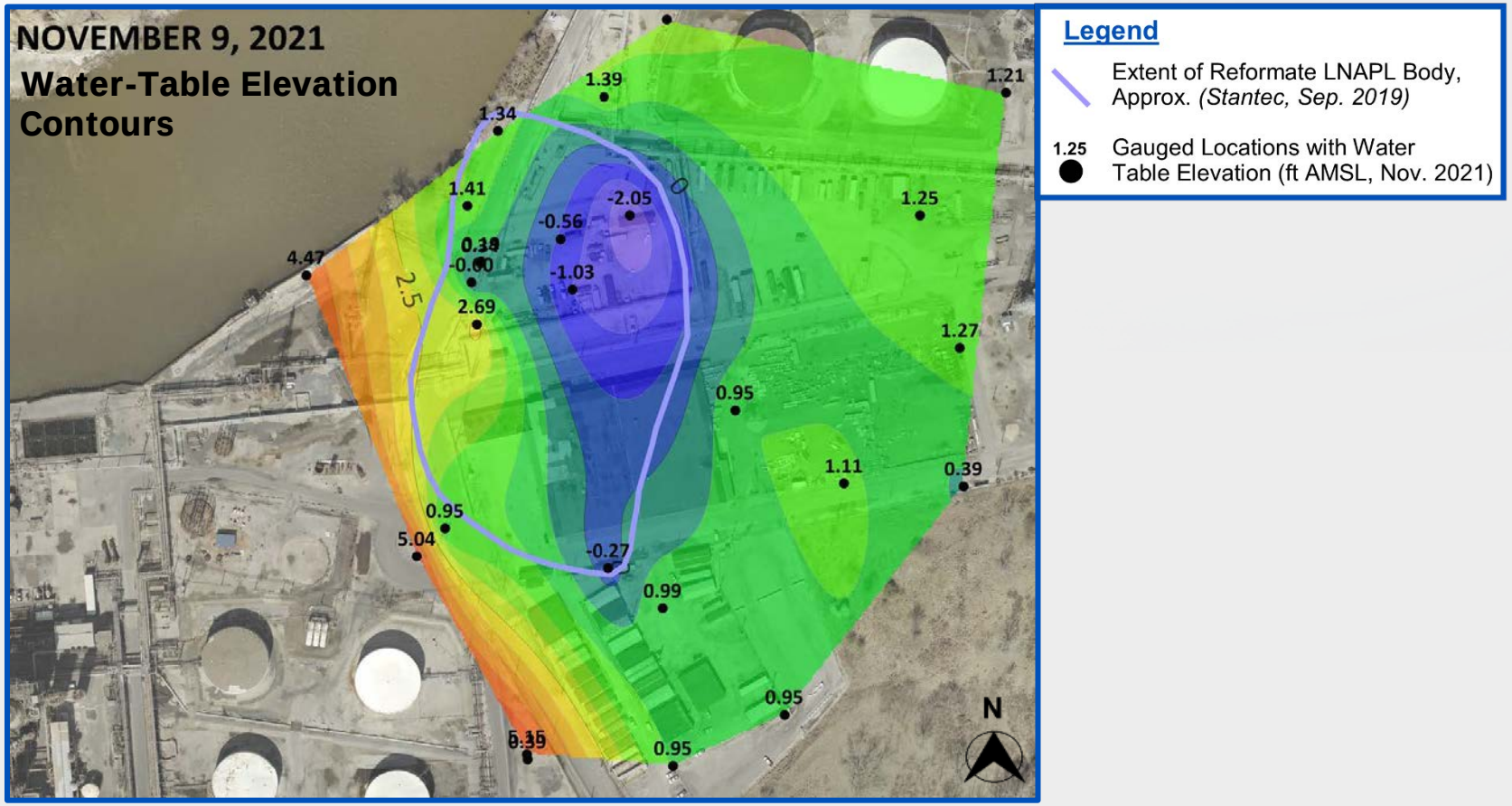
Top of Pleistocene Sand Modeled Surface
Aestus, ft AMSL, CI: 2 ft
(4 – 23 ft BGS/~-6 – 9 ft AMSL)



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Hydrogeology CSM
Hydrogeologic Conditions

- Complicated flow pattern (utilities; bulkheads)
- GW table varies from ~10 to 20 ft BGS (~-2 to 5 ft AMSL)
- Groundwater contour highs largely mirror LNAPL body
- Middle Clay Unit (~25- 30 ft BGS) aquitard (Stantec, 2017) within Potomac Formation hydraulically separates water table from deeper water-bearing unit

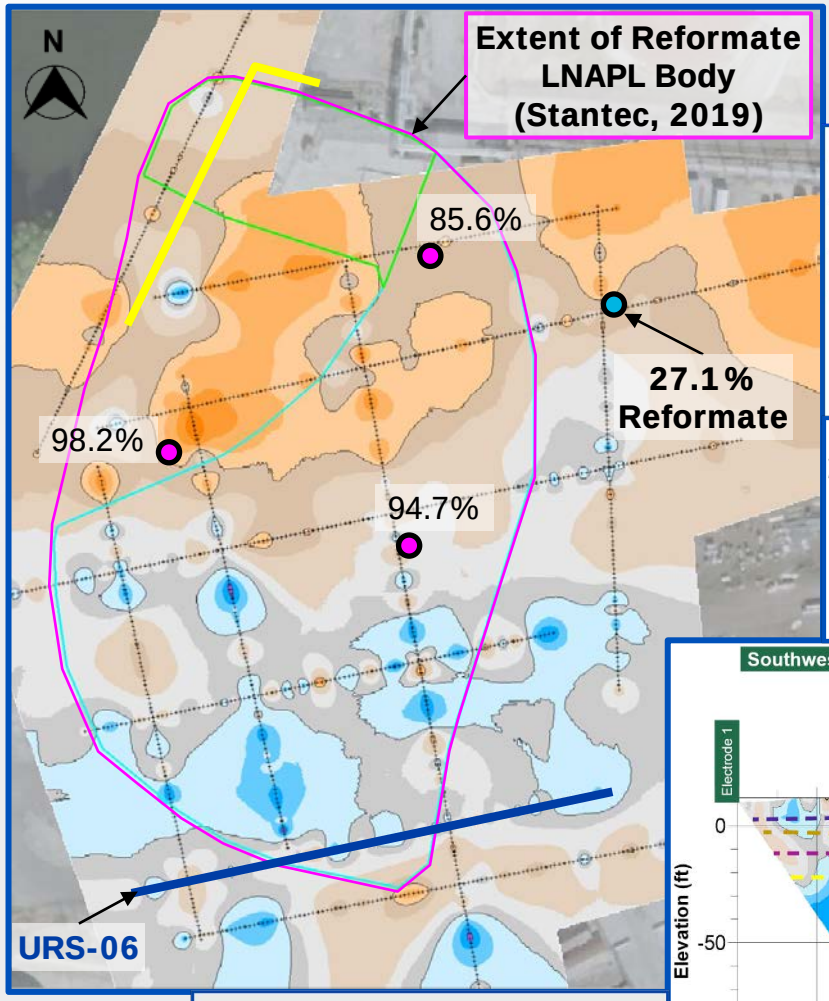


Groundwater Elevation Contour Map
ft AMSL, Provided by Stantec (2021)

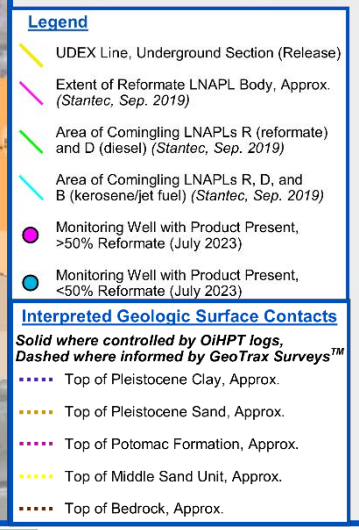
Aestus

Contaminant CSM
Lateral Trends: Electrical Resistors

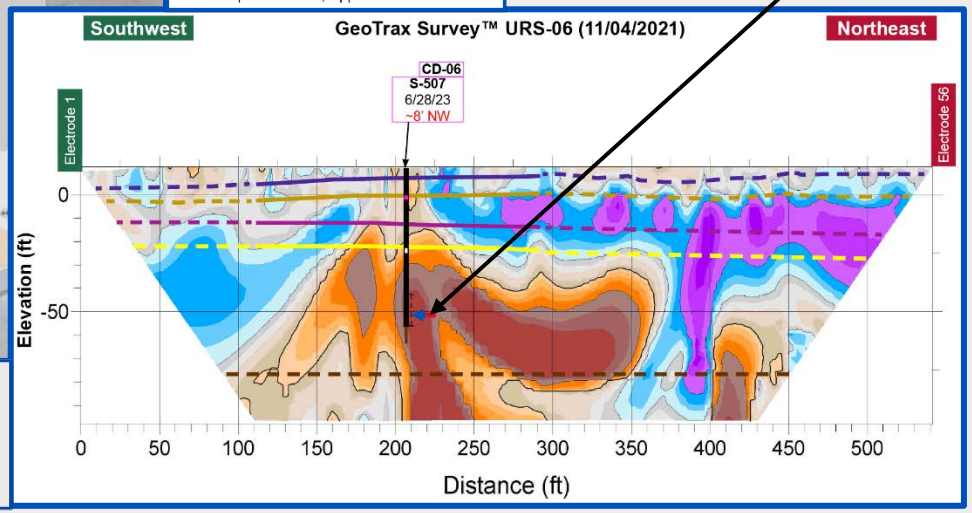
- Reformate free product plume corresponds to western electrical resistors (~150 – 1000 Ω-m)
- Older jet fuel is electrically resistive in eastern zone
- Strong (>1000 Ω-m) electrical resistors likely biogenic gas pockets
  - Correspond with high concentrations of biogenic gases (particularly CO_2)



Aestus GeoTrax Survey™
Interpolated Resistivity Elevation Slice
0 ft AMSL, ~15 ft BGS (Approx. Water Table)

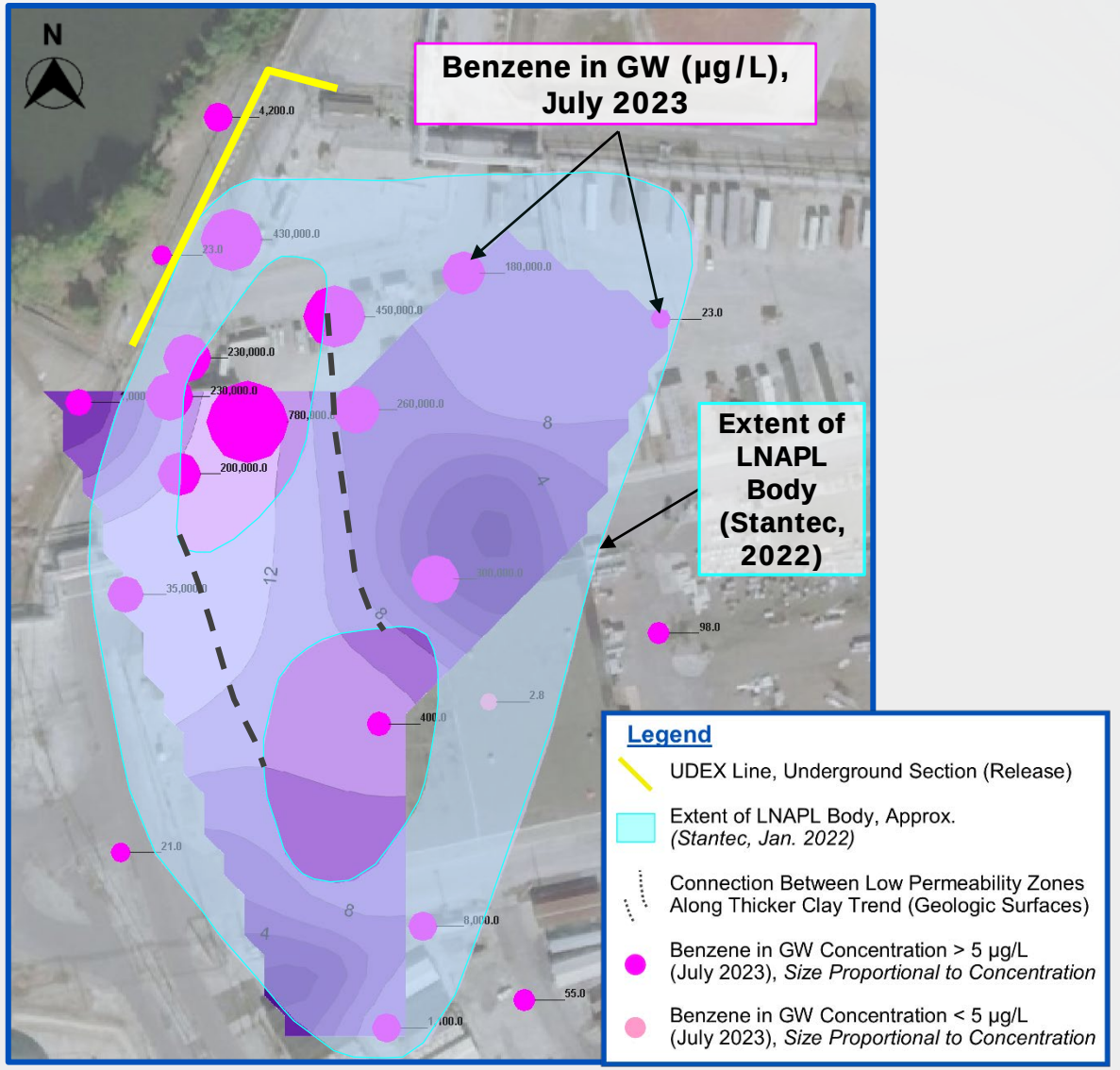


S-507 July 2023 GW (µg/L)	
Benzene	16
Diss. O_2	0
Methane	33.9
CO_2	**124,000**



Contaminant CSM
Lateral Trends: Thicker Clay

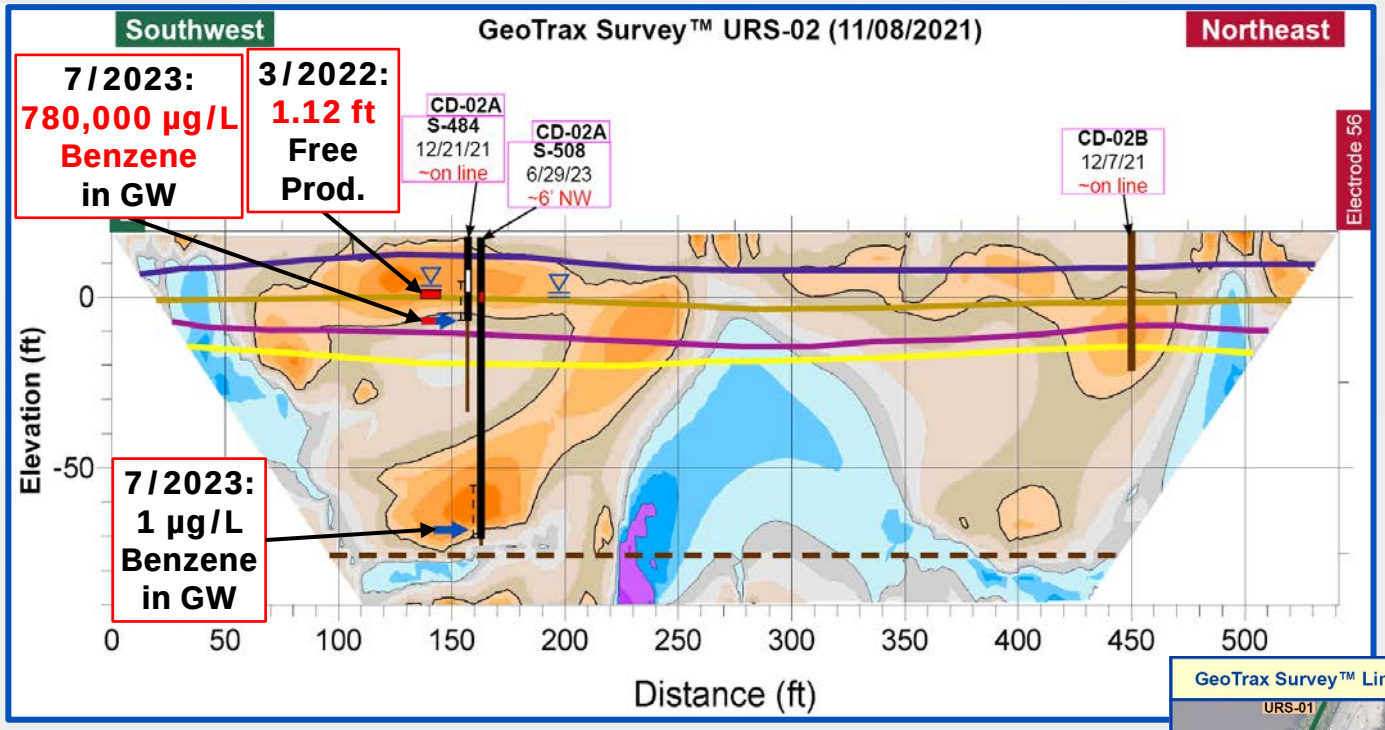
- Correspond with Stantec's interpreted low perm zones within LNAPL plume
- Historically minimal free phase LNAPL
- High dissolved phase impacts (780,000 µg/L benzene, July 2023)
- Indicates residual LNAPL may be present along trend

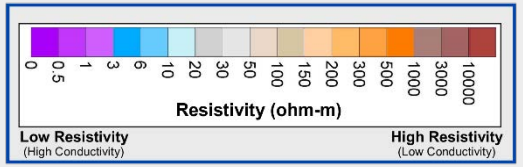


Top of Pleistocene Clay
Modeled Surface
Aestus, ft AMSL,
Contour Interval (CI): 2 ft

Contaminant CSM Vertical Trends

- Impacts appear to have concentrated in the Pleistocene Sand (underneath Pleistocene Clay) along water table (~10 – 20 ft BGS)
  - Majority of free product/BTEX impacts observed at this depth
  - Fluorescence peaks
  - Electrically resistive zones
  - Groundwater contour highs largely mirror LNAPL body

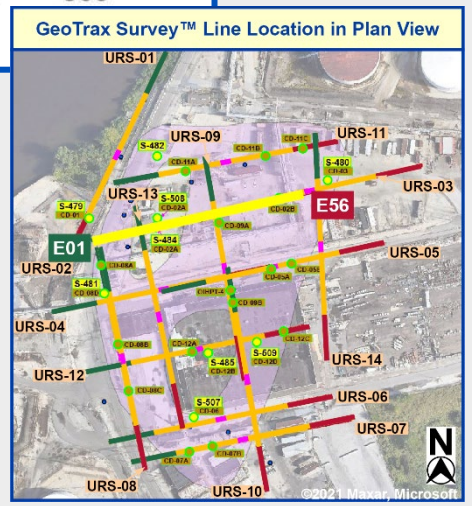




Interpreted Geologic Surface Contacts

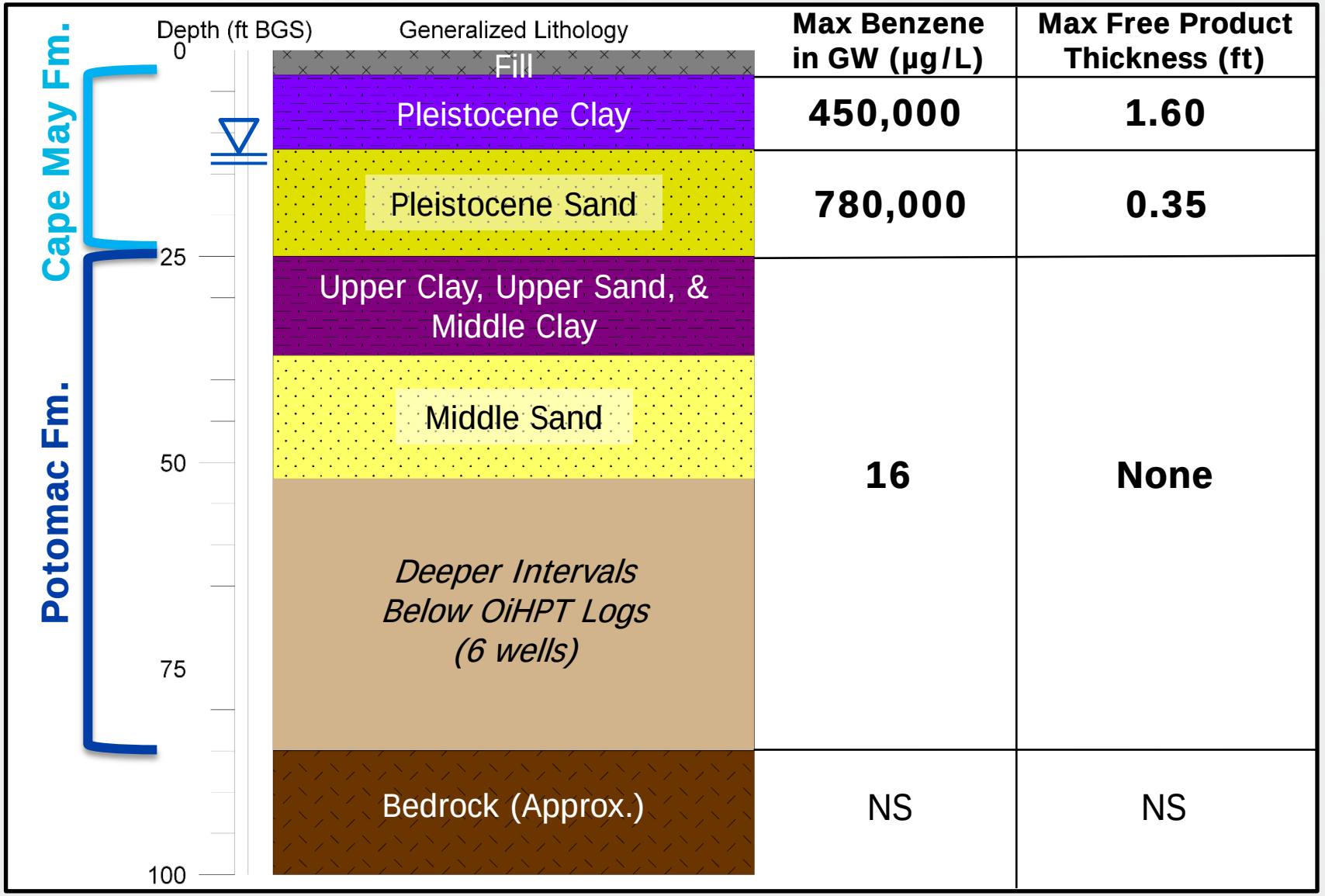
Solid where controlled by OiHPT logs, Dashed where informed by GeoTrax Surveys™

- Top of Pleistocene Clay, Approx.
- Top of Pleistocene Sand, Approx.
- Top of Potomac Formation, Approx.
- Top of Middle Sand Unit, Approx.
- Top of Bedrock, Approx.



Contaminant CSM
Vertical Extent of Impacts: July 2023

Only relatively minor (≤16 µg/L) benzene impacts observed within Potomac Formation in recent sampling

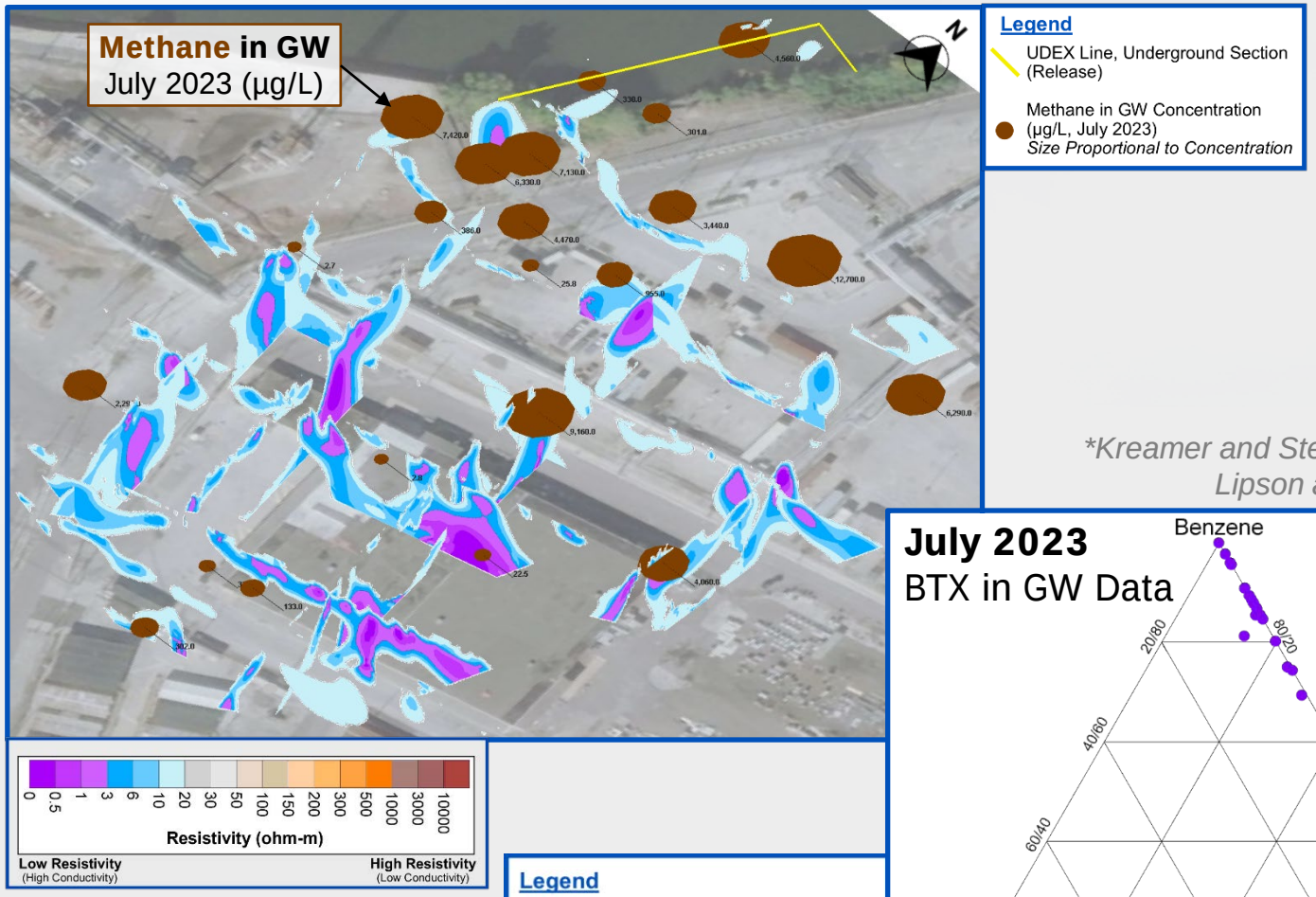


Max Benzene in GW (µg/L)	Max Free Product Thickness (ft)
450,000	1.60
780,000	0.35
16	None
NS	NS

*Benzene in GW regulatory standard: 5 µg/L
**NS: Not Sampled in GeoTrax Survey™ Imaging Domain

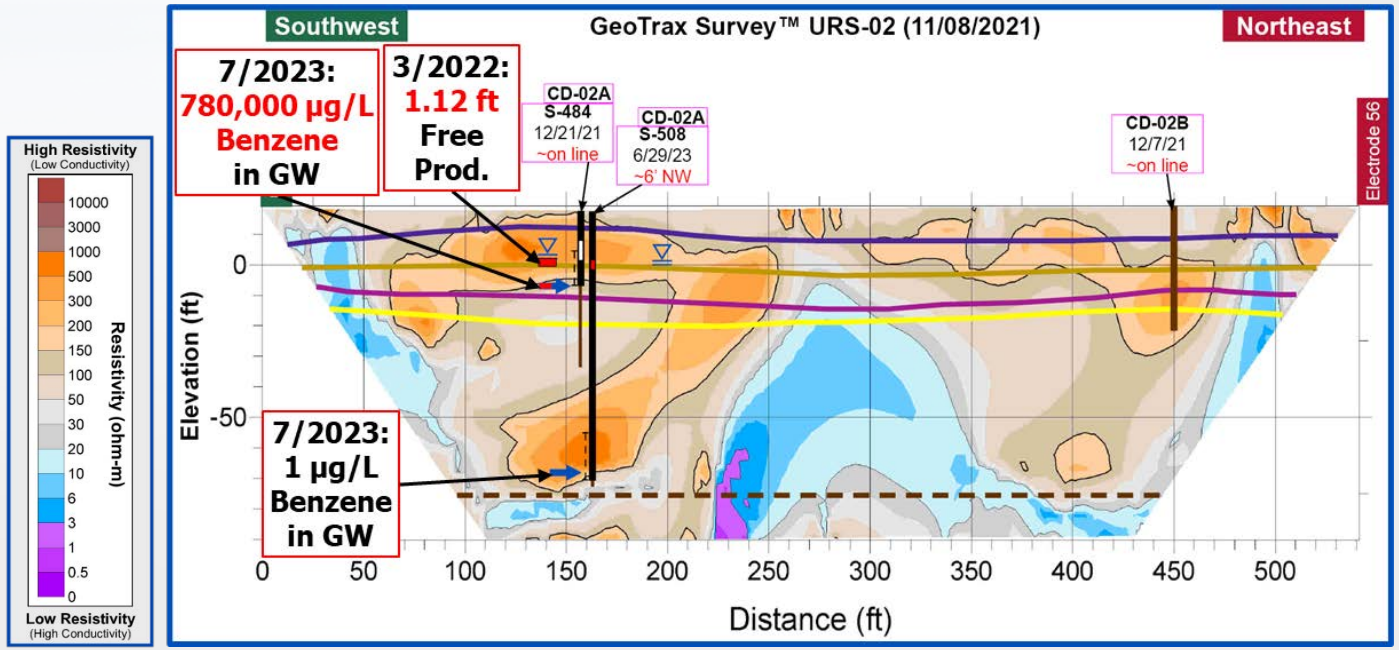
Bioactivity CSM

- Bioactivity strong across Site
  - Strong (<3 Ω-m) electrical conductors
  - High methane (12,500 µg/L) and CO_2 (131,000 µg/L)
  - Significant bacterial biomass (32.5 billion gc/L)
  - Elevated GW temps (~18 – 35 °C)
- Dissolved phase BTEX impacts dominantly benzene-rich



*Kreamer and Stetzenbach (1990); Lipson and Siegel (2000)

Final Report Phase
CSM Update Summary (Recap)



July 2023

Depth (ft BGS)	Generalized Lithology	Max Benzene in GW (µg/L)	Max Free Product Thickness (ft)
	Fill		
Cape May Fm.	Pleistocene Clay	450,000	1.60
	Pleistocene Sand	780,000	0.35
Potomac Fm.	Upper Clay, Upper Sand, & Middle Clay	16	None
	Middle Sand		
	Deeper Intervals Below OiHPT Logs (6 wells)		
	Bedrock (Approx.)	NS	NS

- High saturation areas are electrically resistive in Pleistocene Clay and Pleistocene Sand (approx. GWE)
- Only minor (≤16 µg/L) impacts within Potomac Formation
- Integrated data support active biodegradation
- Remedial activities demonstrate significant reduction of LNAPL mass
- Expect ongoing biodegradation to continue

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ANY QUESTIONS ON CSM UPDATES?

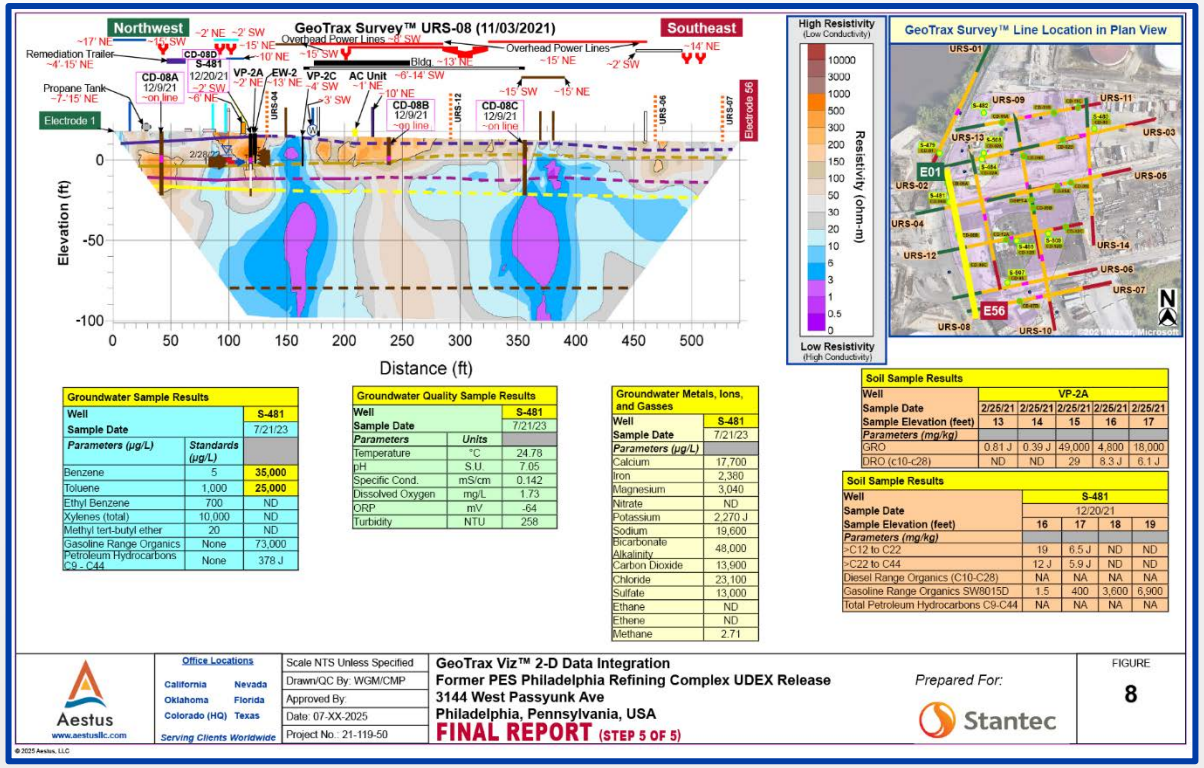
Up Next: Final Report Stage Deliverables from Aestus

Aestus

Final Report Components

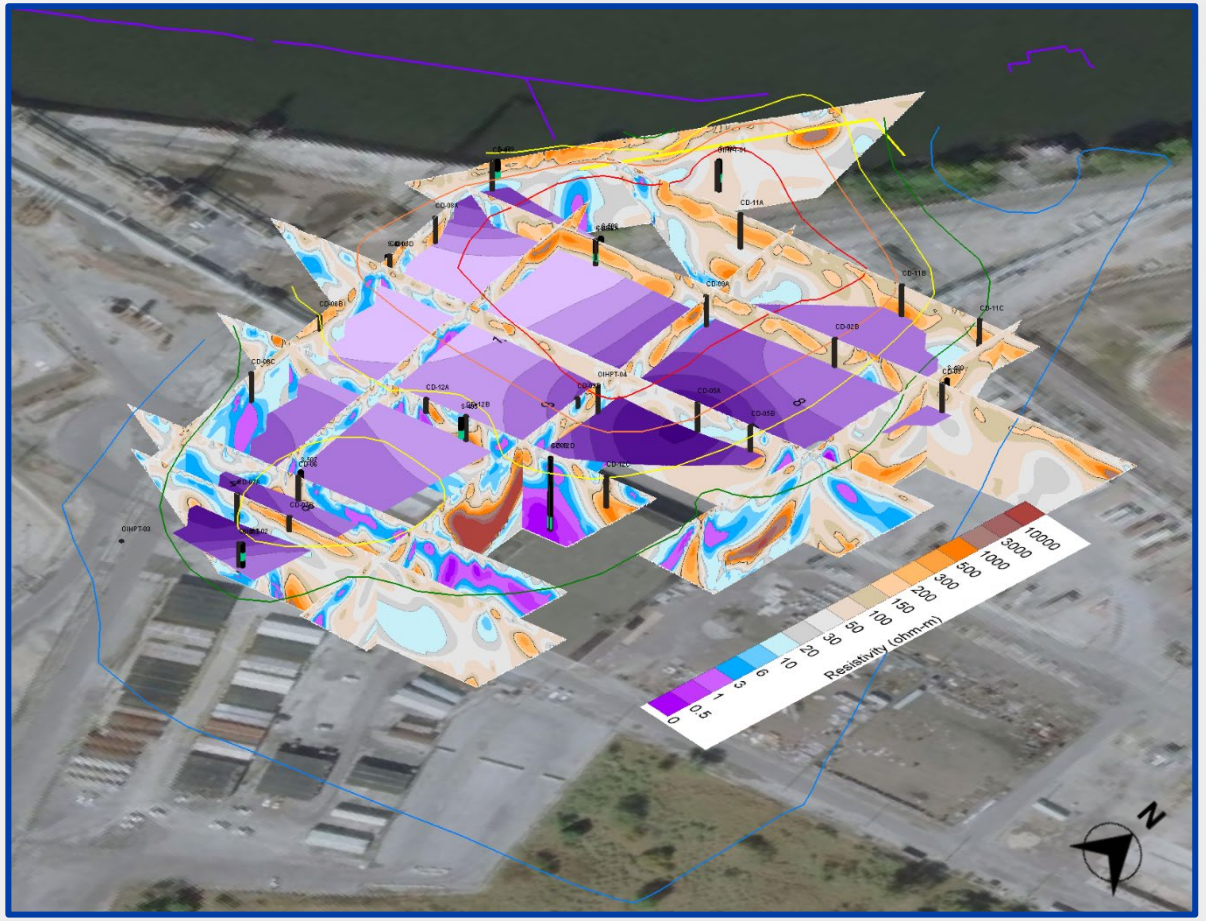
- This PowerPoint presentation summarizes CSM updates; no text section planned
- Figures: 2D images of each GeoTrax Survey™ line with historical MW data, site features, and as-built CD locations shown
- 3-D Visualization Model: GeoTrax Survey™ Images, client boring data, site features, CD results
- Table: geospatial data from GeoTrax Survey™ investigation
- Additional materials available upon request
  - Field notes/site photos
  - XYZR image data files

Deliverables – 2D & 3D



2D Figures in Bookmarked / Layered PDF

3D RockWorks Model



Aestus

Additional Questions?

Thank you for your time!

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Aestus



GeoTrax CSM+™
Conceptual Site Model Update
Final Report
Former PES UDEX Release
Philadelphia, PA, USA

Aestus
GeoTrax CSM+™

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Office Locations

California Nevada
Oklahoma Florida
Colorado (HQ) Texas

Serving Clients Worldwide

Scale NTS Unless Specified
Drawn/QC By: AML/MLC
Approved By: SMF
Date: 07-11-2025
Project No.: 21-119-50

GeoTrax CSM+™ Development Results
Former PES Philadelphia Refining Complex UDEX Release
3144 West Passyunk Ave
Philadelphia, Pennsylvania, USA
FINAL REPORT (STEP 5 OF 5)

Prepared For:
Stantec

FIGURE
Title Page

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Aestus' Contaminant Electrical Hydrogeology Mapping & Conceptual Site Model Update Process

We are Here

1 Site Data in 3D

- Client sends existing site data to Aestus
- Integrate data in 3D visualization model
- Must occur prior to field work (Step 2)

2 Subsurface Scan

- GeoTrax Survey™ field data aquisition
- Use dynamic work strategy with QA/QC
- Yields high resolution 2D continuous images

3 Interim Report

- Integrate scanning data in 2D & 3D (QC)
- Interpret datasets; form hypotheses
- Select confirmation drilling locations

4 Targeted Drilling

- Confirmation drilling & sampling by client
- Test hypotheses from Interim Report
- Client sends final data package to Aestus

5 Final Report

- Integrate confirmation drilling data (QC)
- Updated conceptual site model (CSM)
- Remedial design characterization report

Aestus
www.aestusllc.com

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California Nevada
Oklahoma Florida
Colorado (HQ) Texas
Serving Clients Worldwide

Scale	NTS Unless Specified
Drawn/QC By:	AML/MLC
Approved By:	SMF
Date:	07-11-2025
Project No.:	21-119-50

GeoTrax CSM+™ Development Results
Former PES Philadelphia Refining Complex UDEX Release
3144 West Passyunk Ave
Philadelphia, Pennsylvania, USA
FINAL REPORT (STEP 5 OF 5)

Prepared For: Stantec

FIGURE
CSM+ Process

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Legend and Symbols

(for reference when reviewing all Figures)

Site Features and Geologic Surface Contacts

Indicates various site features which are labeled accordingly on the figures

URS-01 Indicates areas where GeoTrax Surveys™ intersect

Pipeline

Groundwater sample from a specific interval/screen interval

Water sample where one or more constituents are above standards

Soil sample from a specific interval

Soil sample where one or more constituents are above standards

Interpreted Geologic Surface Contacts

Solid where controlled by OiHPT logs, dashed where informed by GeoTrax Surveys™

- Top of Pleistocene Clay (Cape May Fm.) / Base of Fill, Approx.
- Top of Pleistocene Sand (Cape May Fm.), Approx.
- Top of Potomac Formation, Approx.
- Top of Middle Sand Unit (Potomac Fm.), Approx.
- Top of Bedrock, Approx.

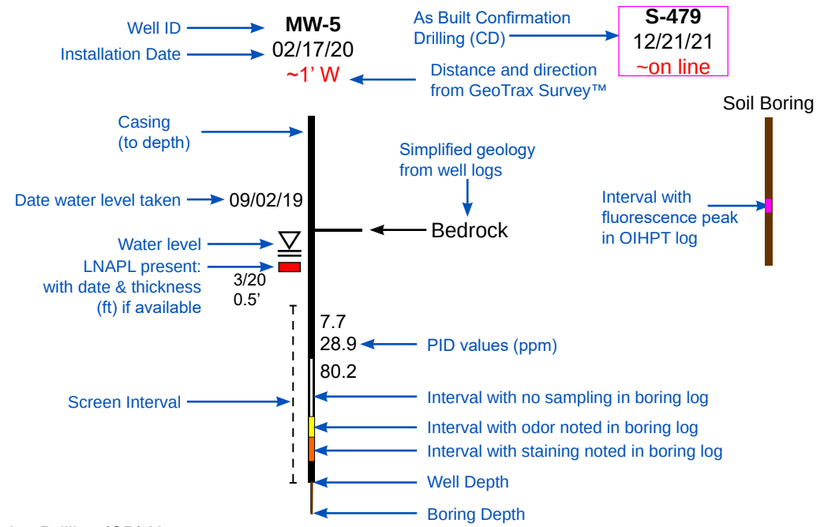
Analytical Data

Analytical soil and groundwater data and regulatory stanadards for wells near GeoTrax Surveys™ provided by Stantec.

Groundwater: Non-Res GW Used Aquifer (TDS ≤ 2500)
Soil: Non-Res Direct Contact with Soil MSC & Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC

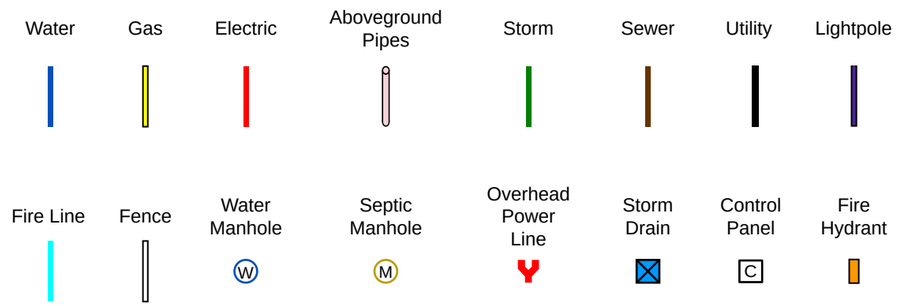
Bold: Constituent concentration exceeds standards
J: Detected but below the reporting limit
NA: Not Analyzed
ND: Non-detect for given analyte
NS: Not Sampled

Monitoring Well Explanation



Confirmation Drilling (CD) Notes:
- CD Borings are included when within 10 feet of a GeoTrax Survey™
- CD Wells are included when within 15 feet of a GeoTrax Survey™
- CD Wells with an associated boring are posted at the same location (though the actual locations may be a few feet apart in the field)
- Date for well construction is shown for CD wells with an associated boring. Total depth is based on the boring.

Utilities



General Notes: *Locations of site features (e.g. utilities, wells, etc) are approximate.*

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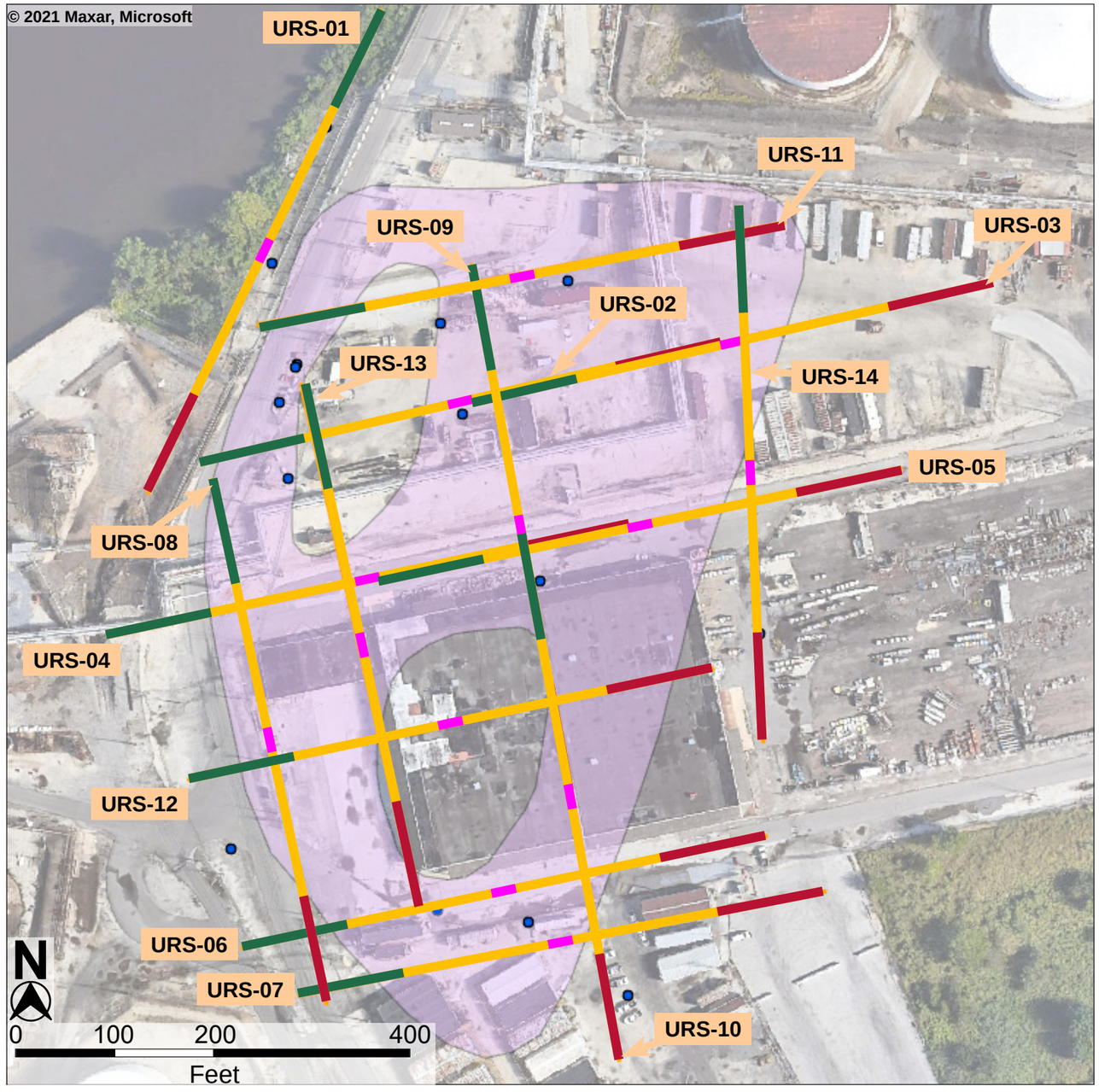
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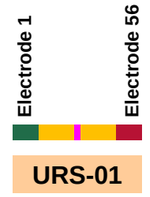
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FIGURE
Legend/ Symbols

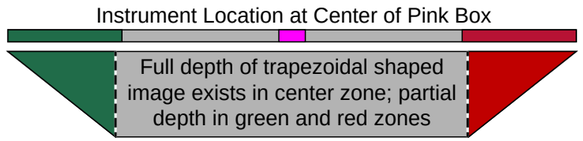
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GeoTrax Survey™ Orientation & Designation



3.00 Meter Electrode Spacing
Line Length ~541 feet (~165 m)
Image Depth ~108 feet (~33 m)



Legend

- Historical Monitoring Well Locations
- Approx. Extent of LNAPL Body
  Stantec, 2022

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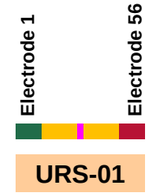
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FIGURE
PV-1

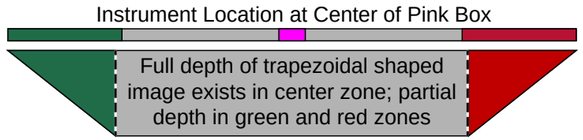
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GeoTrax Survey™ Orientation & Designation



3.00 Meter Electrode Spacing
Line Length ~541 feet (~165 m)
Image Depth ~108 feet (~33 m)



Legend

Approx. Extent of LNAPL Body
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Historical Monitoring Well Locations

As-Built Confirmation Drilling Locations

S-481 / CD-08D — Monitoring Wells & Associated OIHPT Boring
December 2021 & June 2023

CD-12B — OIHPT Boring
December 2021

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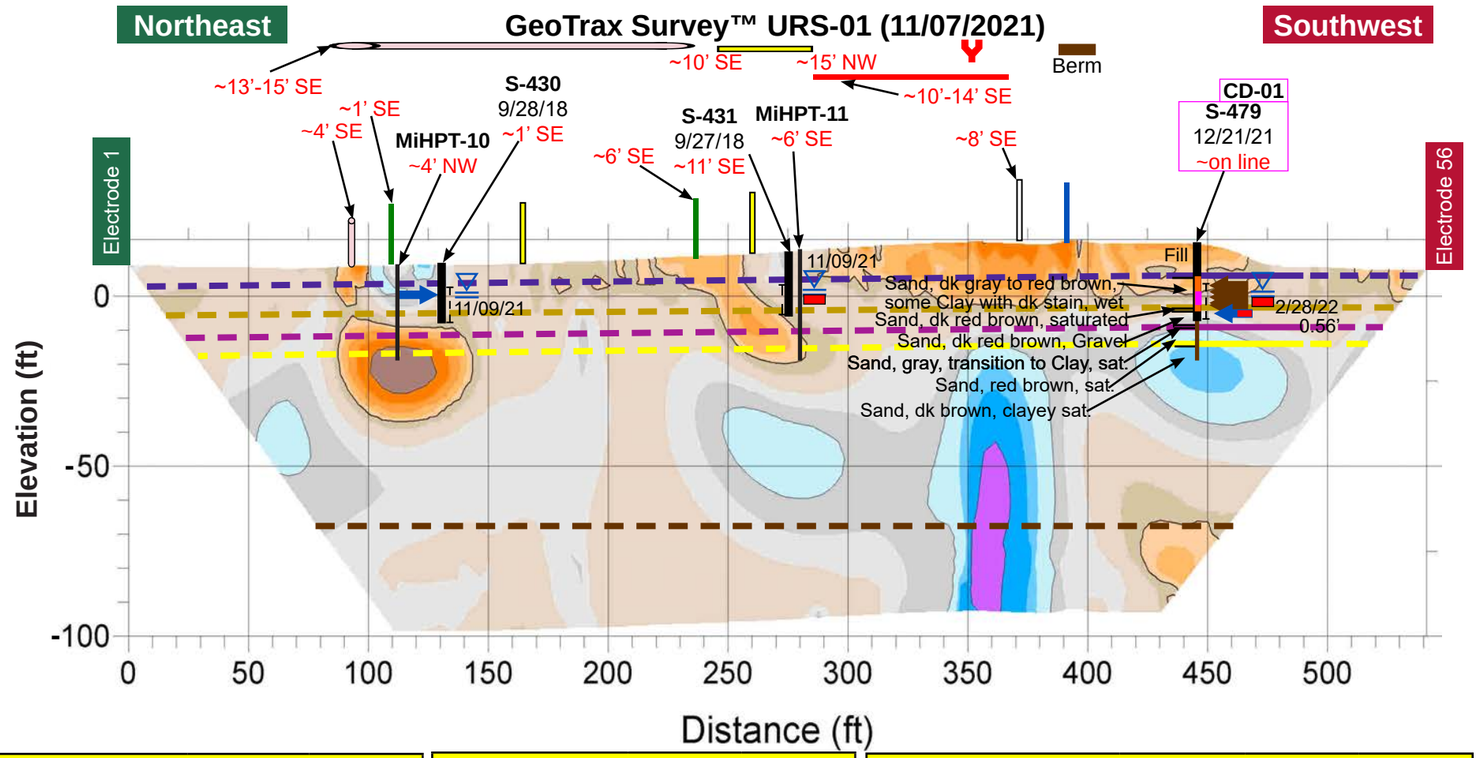
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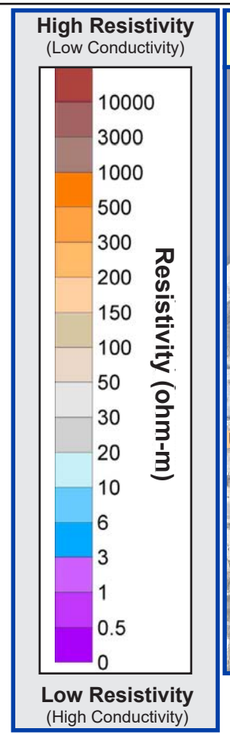
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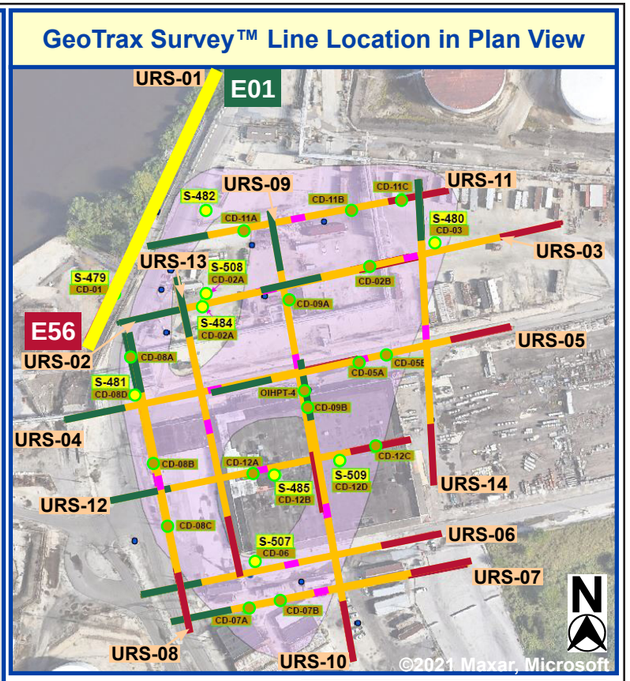
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FIGURE
PV-2

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Groundwater Sample Results

Well		S-479
Sample Date		7/25/23
Parameters (µg/L)	*Standards (µg/L)*	
Benzene	5	**1,000**
Toluene	1,000	160
Ethyl Benzene	700	1.9 J
Xylenes (total)	10,000	10.2 J
Methyl tert-butyl ether	20	ND
Gasoline Range Organics	None	5,600
Petroleum Hydrocarbons C9 - C44	None	156 J

Groundwater Quality Sample Results

Well		S-479
Sample Date		7/25/23
Parameters	*Units*	
Temperature	°C	26.77
pH	S.U.	6.08
Specific Cond.	mS/cm	0.515
Dissolved Oxygen	mg/L	0
ORP	mV	-94
Turbidity	NTU	31.6

Groundwater Sample Results

Well		S-430	S-431
Sample Date			
Parameters (µg/L)	*Standards (µg/L)*		
Benzene	5	NS	NS
Toluene	1,000	NS	NS
Ethylbenzene	700	NS	NS
Xylenes	10,000	NS	NS
Methyl Tertiary Butyl Ether	20	NS	NS

Groundwater Metals and Ions

Well		S-430	S-431
Sample Date			
Parameters	*Units*		
Calcium	µg/L	NS	NS
Ethane	µg/L	NS	NS
Ethene	µg/L	NS	NS
Fluorene	µg/L	NS	NS
Iron	µg/L	NS	NS
Lead	µg/L	NS	NS
Methane	µg/L	NS	NS
Sulfate (as SO4)	µg/L	NS	NS
Total Carbon	µg/L	NS	NS

Groundwater Metals, Ions, and Gasses

Well	S-479
Sample Date	7/25/23
Parameters (µg/L)	
Calcium	61,700
Iron	3,840
Magnesium	9,070
Nitrate	ND
Potassium	4,160
Sodium	29,800
Bicarbonate Alkalinity	182,000
Carbon Dioxide	53,000
Chloride	65,800
Sulfate	6,260
Ethane	ND
Ethene	ND
Methane	7,420

Groundwater Sample Results

		S-479						
		12/21/21					S-430	S-431
Sample Depth (feet BGS)		14	15	16	17	18		
Parameters (mg/kg)								
>C12 to C22		34	ND	180	ND	ND	NS	NS
>C22 to C44		ND	7.8 J	110	ND	ND	NS	NS
Diesel Range Organics (C10-C28)		NA	NA	NA	NA	NA	NS	NS
Gasoline Range Organics SW8015D		1.1 J	3,400	2,000	43	0.66 J	NS	NS
Total Petroleum Hydrocarbons C9-C44		NA	NA	NA	NA	NA	NS	NS

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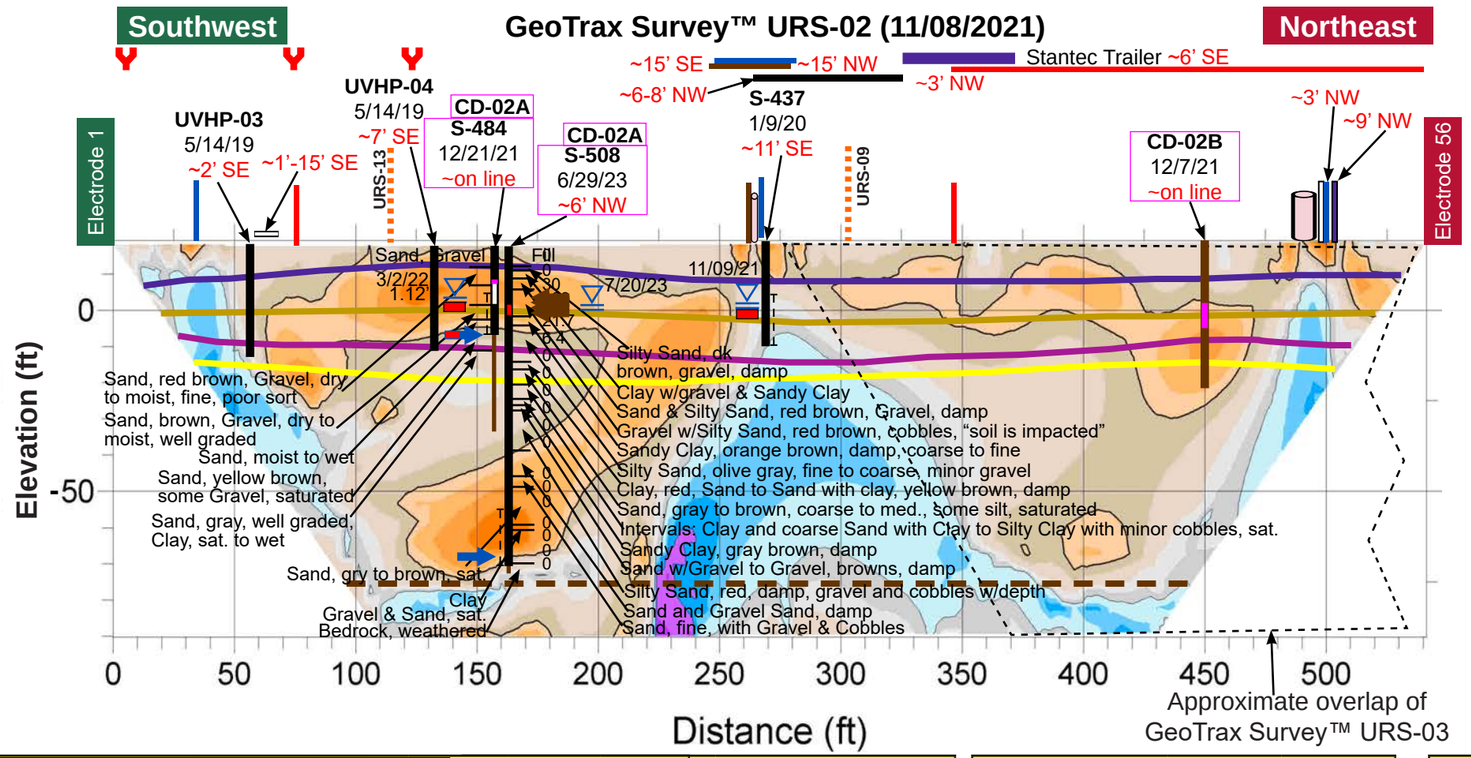
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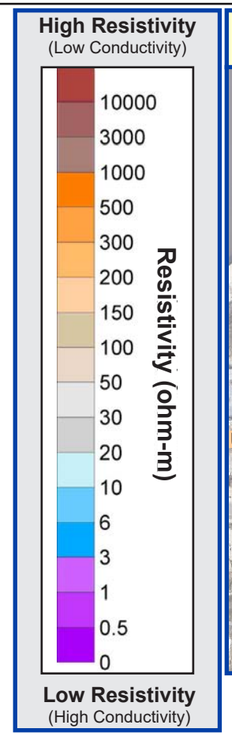
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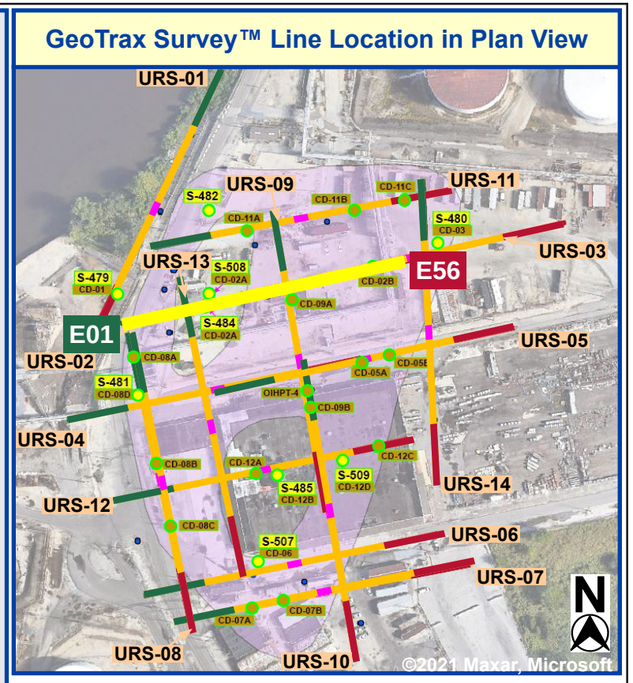
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FIGURE
1

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Groundwater Sample Results

Well		S-484	S-508
Sample Date		7/19/23	7/20/23
Parameters (µg/L)	*Stds (µg/L)*		
Benzene	5	**780,000**	1
Toluene	1,000	**18,000**	ND
Ethyl Benzene	700	ND	ND
Xylenes (total)	10,000	ND	ND
Methyl tert-butyl ether	20	ND	1.4
Gasoline Range Organics	None	790,000	23 J
Petroleum Hydrocarbons C9 - C44	None	616	160 J

Results

S-508			Results	S-437
12/21/21				
16	18	20	*Standards (µg/L)*	
				Free Product Present
NA	ND	ND	5	
NA	ND	ND	1,000	
NA	NA	NA	700	
.66	2,600	11,000	10,000	
.15	NA	NA	20	

Methyl Tertiary Butyl Ether

Groundwater Quality Sample Results

Well		S-437
Sample Date		
Parameters	*Units*	
Temperature	°C	Free Product Present
pH	S.U.	
Specific Cond.	mS/cm	
Dissolved Oxygen	mg/L	
ORP	mV	

Groundwater Quality Sample Results

Well		S-484	S-508
Sample Date		7/19/23	7/20/23
Parameters	*Units*		
Temperature	°C	19.67	18.17
pH	S.U.	6.77	5.96
Specific Cond.	mS/cm	1.09	1.33
Dissolved Oxygen	mg/L	0	0
ORP	mV	-136	-29
Turbidity	NTU	9	7.9

Groundwater Metals and Ions

Well		S-437
Sample Date		
Parameters	*Units*	
Calcium	µg/L	Free Product Present
Ethane	µg/L	
Ethene	µg/L	
Fluorene	µg/L	
Iron	µg/L	
Lead	µg/L	
Methane	µg/L	
Sulfate (as SO4)	µg/L	
Total Carbon	µg/L	

Groundwater Metals, Ions, and Gasses

Well	S-484	S-508
Sample Date	7/19/23	7/20/23
Parameters (µg/L)		
Calcium	132,000	47,800
Iron	20,900	6,430
Magnesium	19,000	53,800
Nitrate	ND	ND
Potassium	8,520	5,780
Sodium	57,100	57,200
Bicarbonate Alkalinity	224,000	312,000
Carbon Dioxide	45,200	115,000
Chloride	215,000	66,400
Sulfate	14,600	121,000
Ethane	ND	1.5
Ethene	ND	0.847
Methane	4,470	25.8

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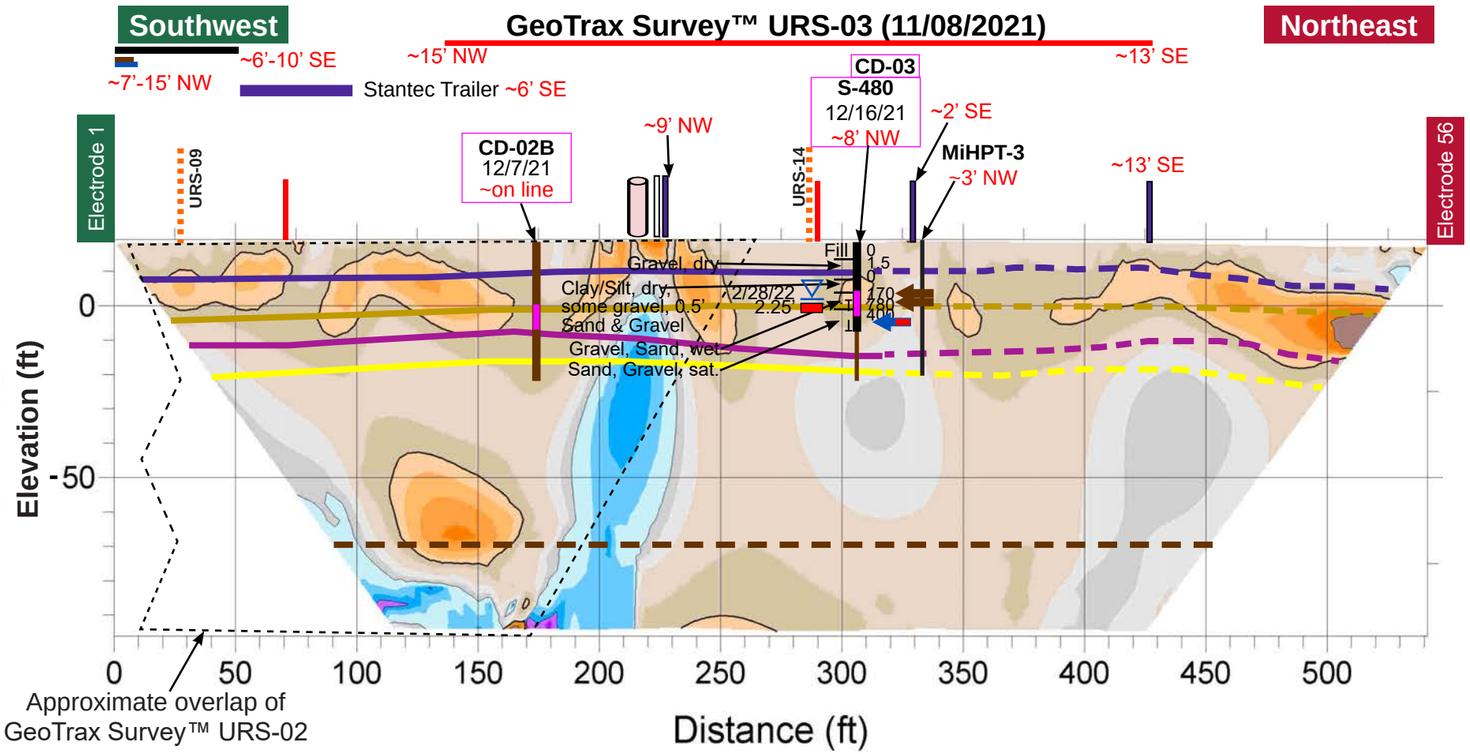
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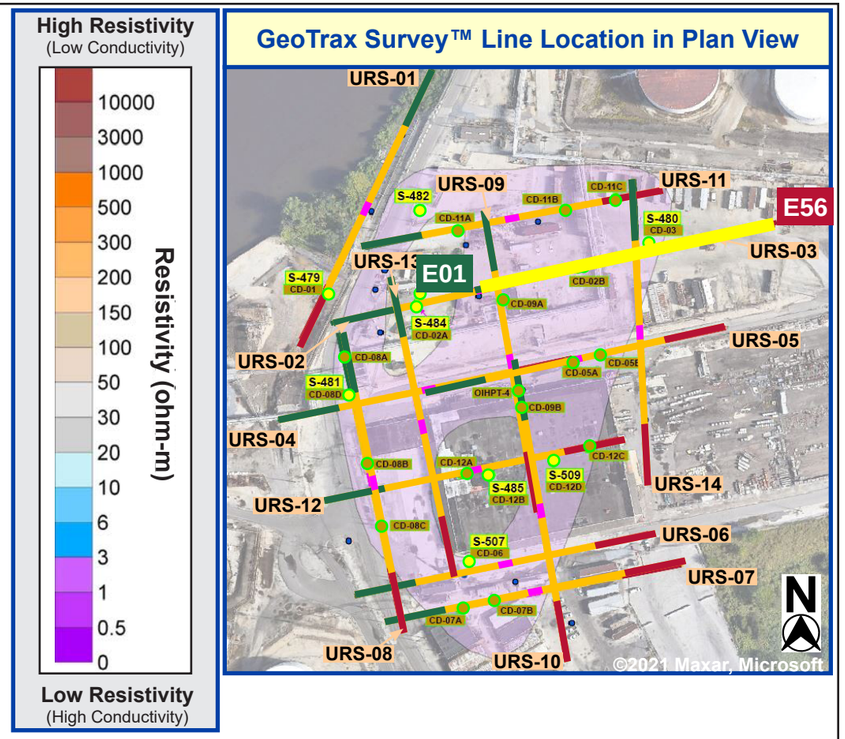
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FIGURE
2

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Groundwater Sample Results		
Well		**S-480**
Sample Date		7/21/23
Parameters (µg/L)	***Standards (µg/L)***	
Benzene	5	**23**
Toluene	1,000	0.92
Ethyl Benzene	700	31
Xylenes (total)	10,000	110.69 J
Methyl tert-butyl ether	20	6.2
Gasoline Range Organics	None	1,500
Petroleum Hydrocarbons C9 - C44	None	3,210

Groundwater Quality Sample Results		
Well		**S-480**
Sample Date		7/21/23
Parameters	***Units***	
Temperature	°C	24.99
pH	S.U.	6.33
Specific Cond.	mS/cm	1.12
Dissolved Oxygen	mg/L	0
ORP	mV	-159
Turbidity	NTU	42.7

Groundwater Metals, Ions, and Gasses	
Well	**S-480**
Sample Date	7/21/23
Parameters (µg/L)	
Calcium	23,400
Iron	49,200
Magnesium	43,100
Nitrate	58.6
Potassium	35,700
Sodium	93,600
Bicarbonate Alkalinity	178,000
Carbon Dioxide	59,800
Chloride	204,000
Sulfate	511 J
Ethane	ND
Ethene	ND
Methane	6,290

Soil Sample Results		
Well	**S-480**	
Sample Date	12/16/21	
Sample Depth (feet BGS)	**17**	**19**
Parameters (mg/kg)		
>C12 to C22	3,200	18,000
>C22 to C44	180	880
Diesel Range Organics (C10-C28)	NA	NA
Gasoline Range Organics SW8015D	73	8,400
Total Petroleum Hydrocarbons C9-C44	NA	NA

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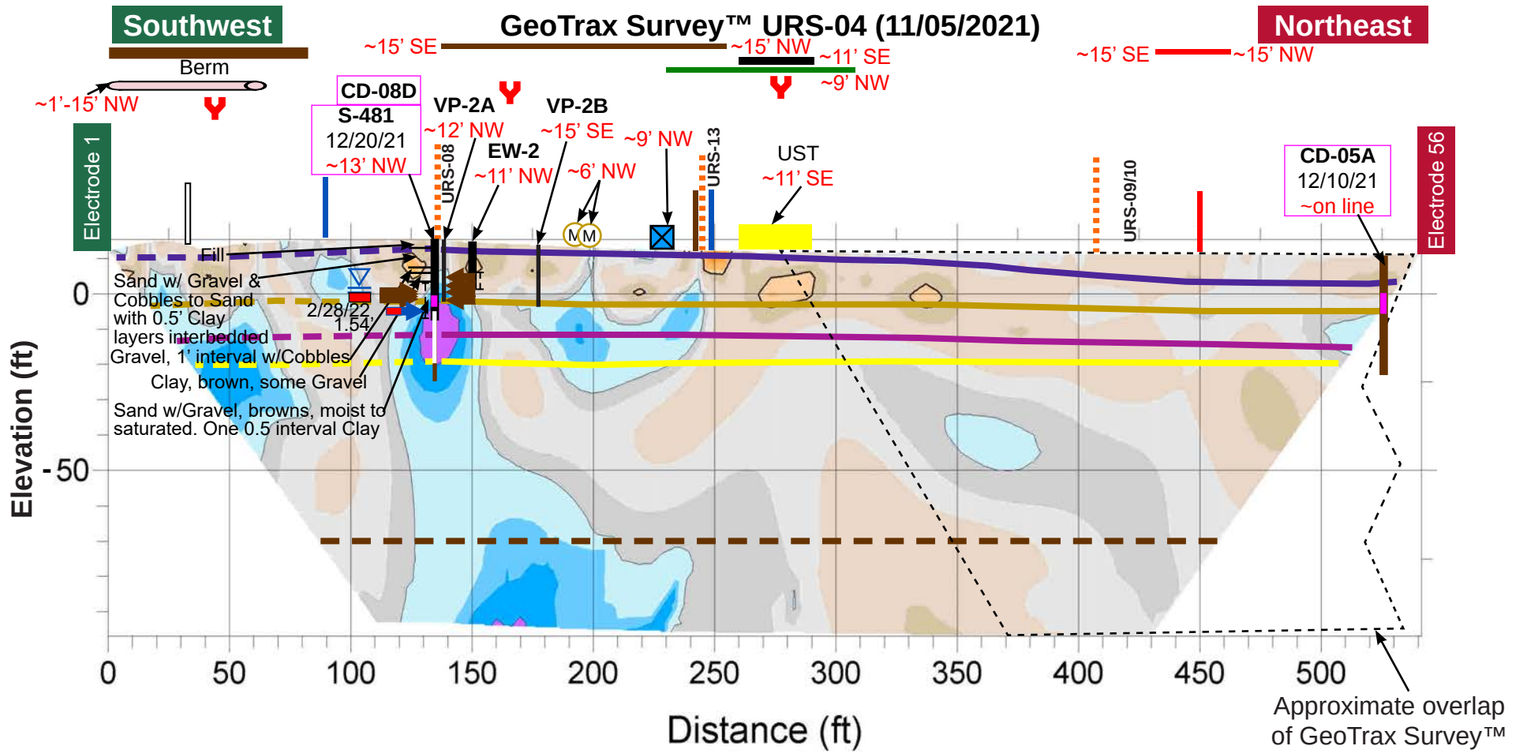
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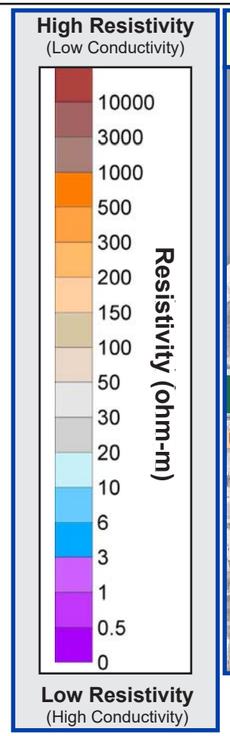
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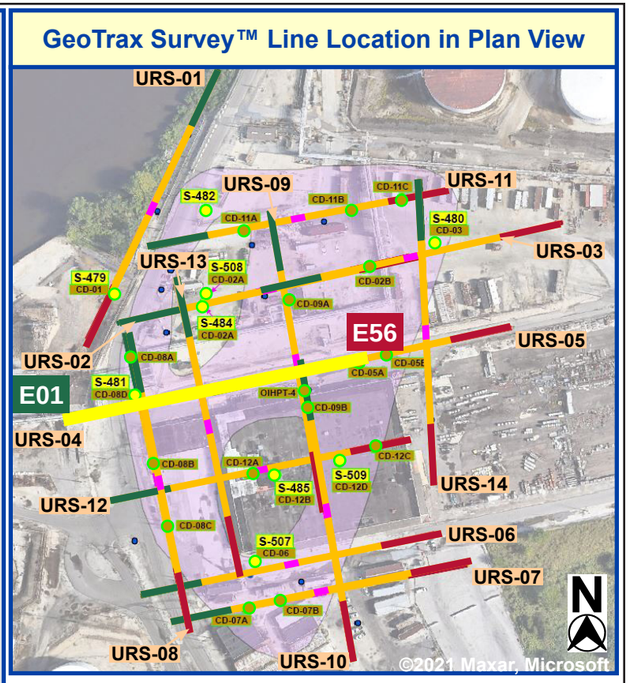
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FIGURE
3

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Groundwater Sample Results

Well		S-481			
Sample Date		7/21/23	12/20/21		
Parameters (µg/L)	*Standards (µg/L)*				
Benzene	5	**35,000**	4,[illegible]		
Toluene	1,000	**25,000**	8[illegible]		
Ethyl Benzene	700	ND			
Xylenes (total)	10,000	ND			
Methyl tert-butyl ether	20	ND			
Gasoline Range Organics	None	73,000	[illegible]7	18	19
Petroleum Hydrocarbons C9 - C44	None	378 J			
>C12 to C22		19	6.5 J	ND	ND
>C22 to C44		12 J	5.9 J	ND	ND
Diesel Range Organics (C10-C28)		NA	NA	NA	NA
Gasoline Range Organics SW8015D		1.5	400	3,600	6,900
Total Petroleum Hydrocarbons C9-C44		NA	NA	NA	NA

Groundwater Quality Sample Results

Well		S-481
Sample Date		7/21/23
Parameters	*Units*	
Temperature	°C	24.78
pH	S.U.	7.05
Specific Cond.	mS/cm	0.142
Dissolved Oxygen	mg/L	1.73
ORP	mV	-64
Turbidity	NTU	258

Groundwater Metals, Ions, and Gasses

Well	S-481
Sample Date	7/21/23
Parameters (µg/L)	
Calcium	17,700
Iron	2,380
Magnesium	3,040
Nitrate	ND
Potassium	2,270 J
Sodium	19,600
Bicarbonate Alkalinity	48,000
Carbon Dioxide	13,900
Chloride	23,100
Sulfate	13,000
Ethane	ND
Ethene	ND
Methane	2.71

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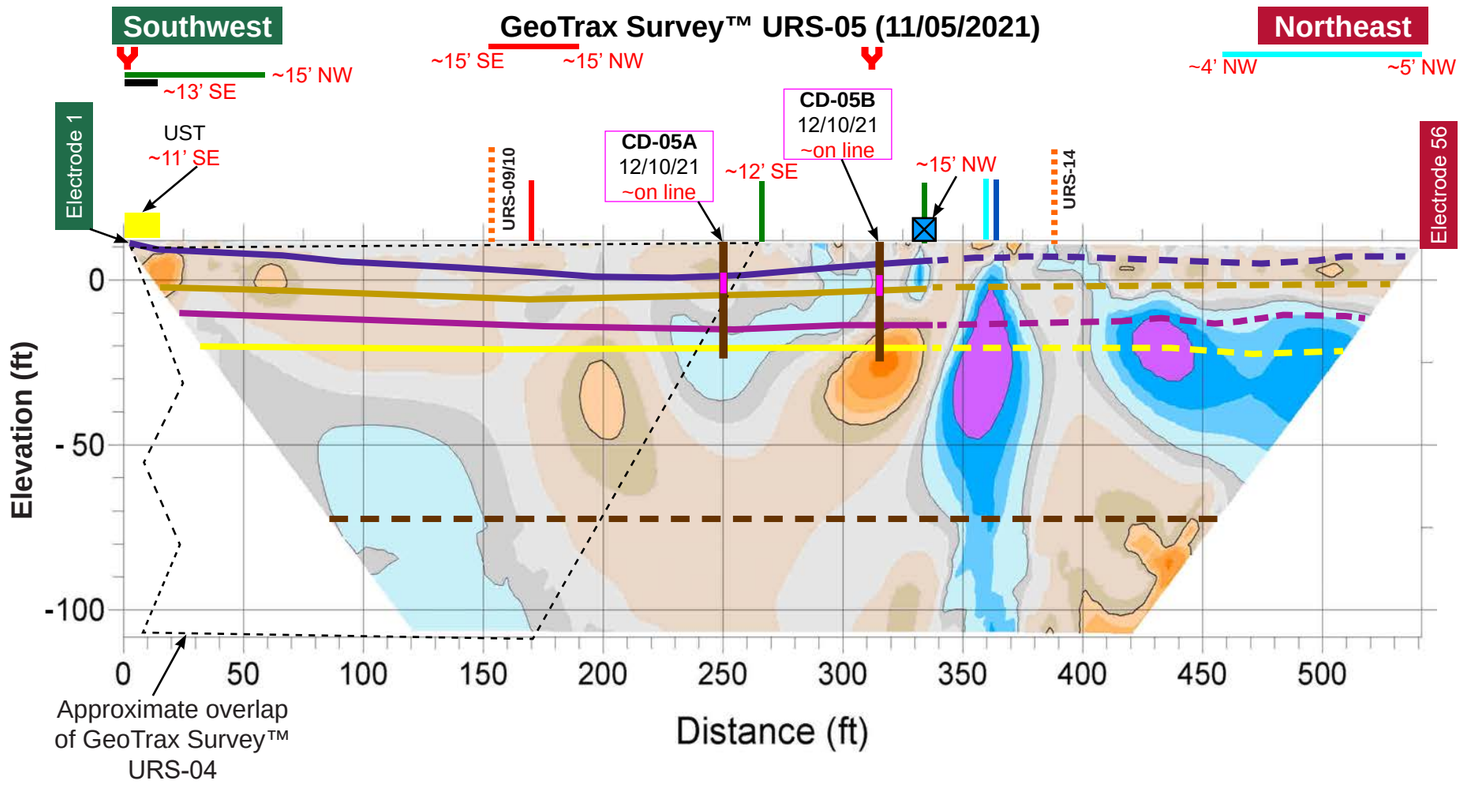
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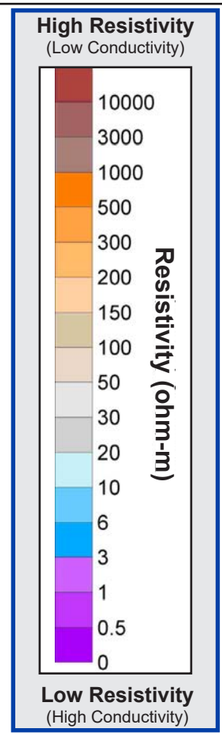
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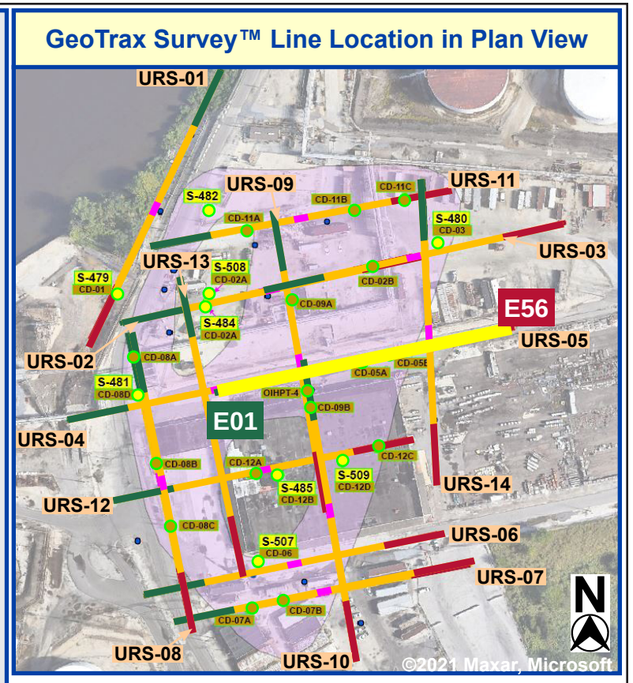
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FIGURE
4

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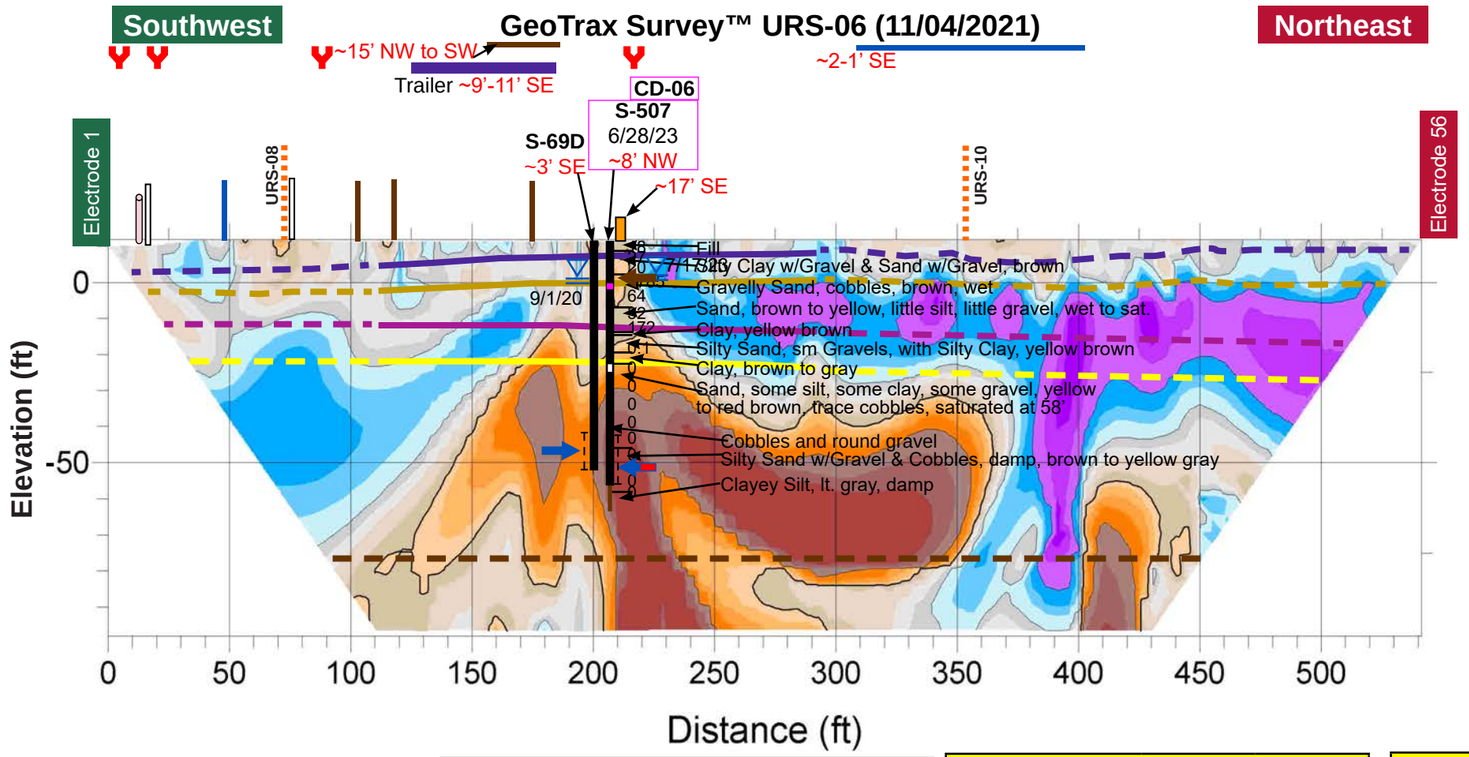


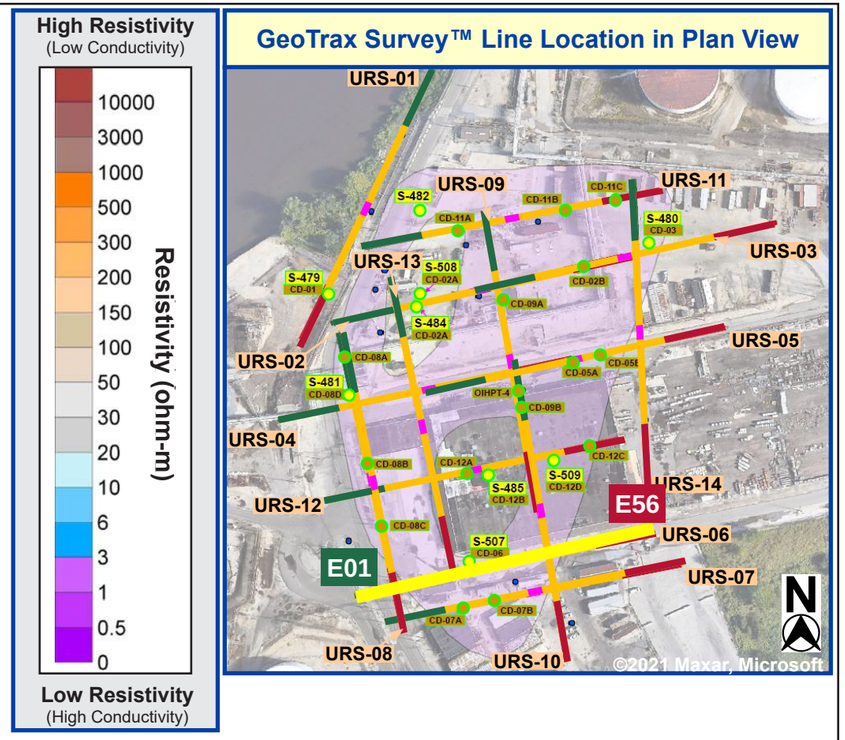


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FIGURE
5

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Groundwater Sample Results

Well	S-507
Sample Date	7/17/23
Parameters (µg/L)	*Standards (µg/L)*	
Benzene	5	**16**
Toluene	1,000	1.9
Ethyl Benzene	700	ND
Xylenes (total)	10,000	ND
Methyl tert-butyl ether	20	2.5
Gasoline Range Organics	None	84
Petroleum Hydrocarbons C9 - C44	None	376 J
Parameters (mg/kg)	
>C12 to C22	NA
>C22 to C44	NA
Diesel Range Organics (C10-C28)	NA
Gasoline Range Organics SW8015D	520
Total Petroleum Hydrocarbons C9-C44	158

Groundwater Sample Results

Well	S-69D
Sample Date	9/1/20
Parameters (µg/L)	*Standards (µg/L)*	
Benzene	5	ND
Toluene	1,000	ND
Ethylbenzene	700	ND
Xylenes	10,000	ND
Methyl Tertiary Butyl Ether	20	1.7

Groundwater Quality Sample Results

Well	S-507
Sample Date	7/17/23
Parameters	*Units*	
Temperature	°C	19.16
pH	S.U.	6.22
Specific Cond.	mS/cm	1.09
Dissolved Oxygen	mg/L	0
ORP	mV	-24
Turbidity	NTU	71.9

Groundwater Quality Sample Results

Well	S-69D
Sample Date	9/1/20
Parameters	*Units*	
Temperature	°C	19.73
pH	S.U.	6.26
Specific Cond.	mS/cm	0.914
Dissolved Oxygen	mg/L	0
ORP	mV	NS

Groundwater Metals and Ions

Well	S-69D
Sample Date	4/26/21
Parameters	*Units*	
Calcium	µg/L	63,000
Ethane	µg/L	ND
Ethene	µg/L	ND
Fluorene	µg/L	ND
Iron	µg/L	1,800
Lead	µg/L	ND
Methane	µg/L	47
Sulfate (as SO4)	µg/L	92,000
Total Carbon	µg/L	57,000

Groundwater Metals, Ions, and Gasses

Well	S-507
Sample Date	7/17/23
Parameters (µg/L)	
Calcium	62,700
Iron	750
Magnesium	46,200
Nitrate	ND
Potassium	10,200
Sodium	85,900
Bicarbonate Alkalinity	306,000
Carbon Dioxide	124,000
Chloride	123,000
Sulfate	77,000
Ethane	ND
Ethene	ND
Methane	33.9

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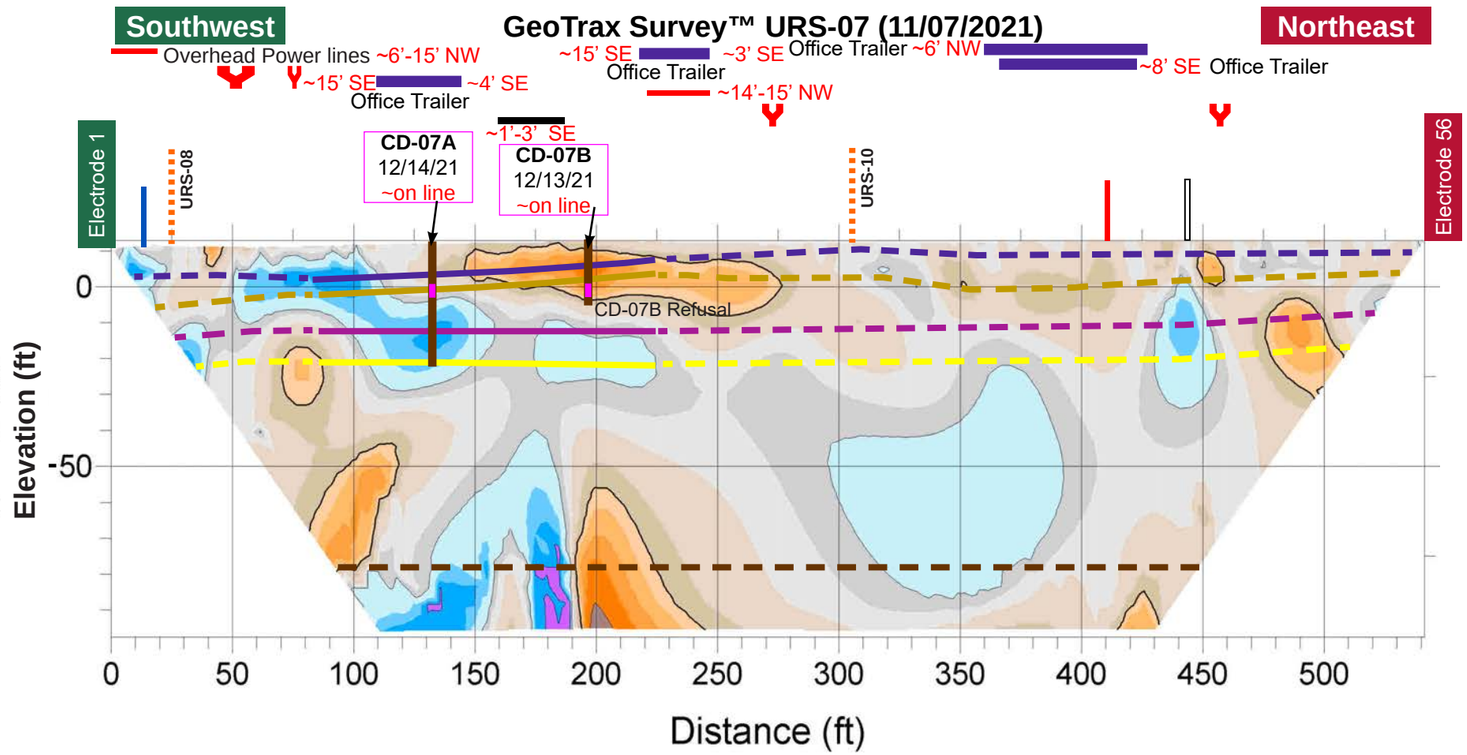
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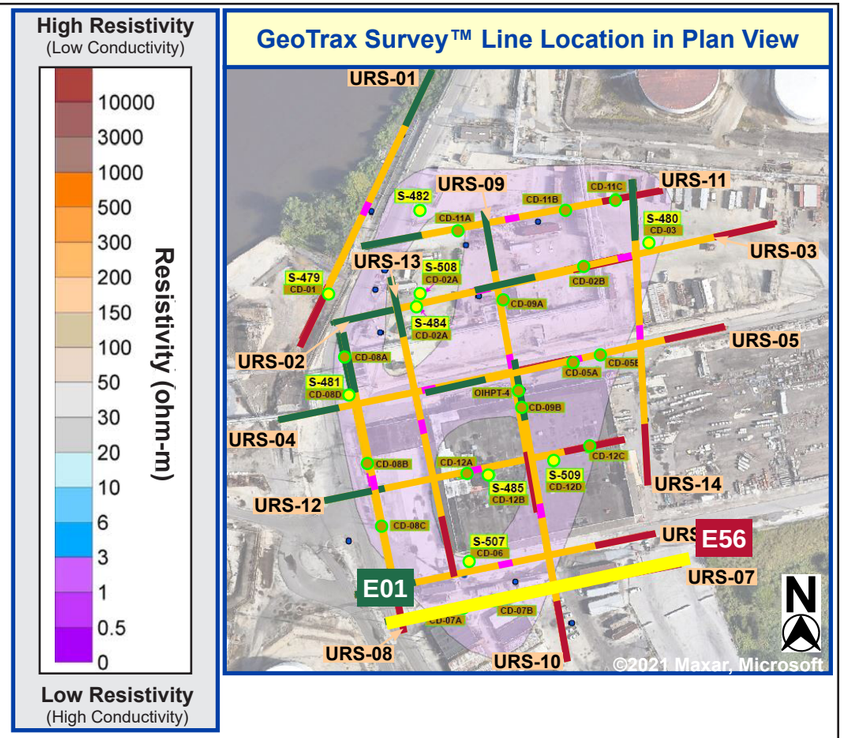
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FIGURE
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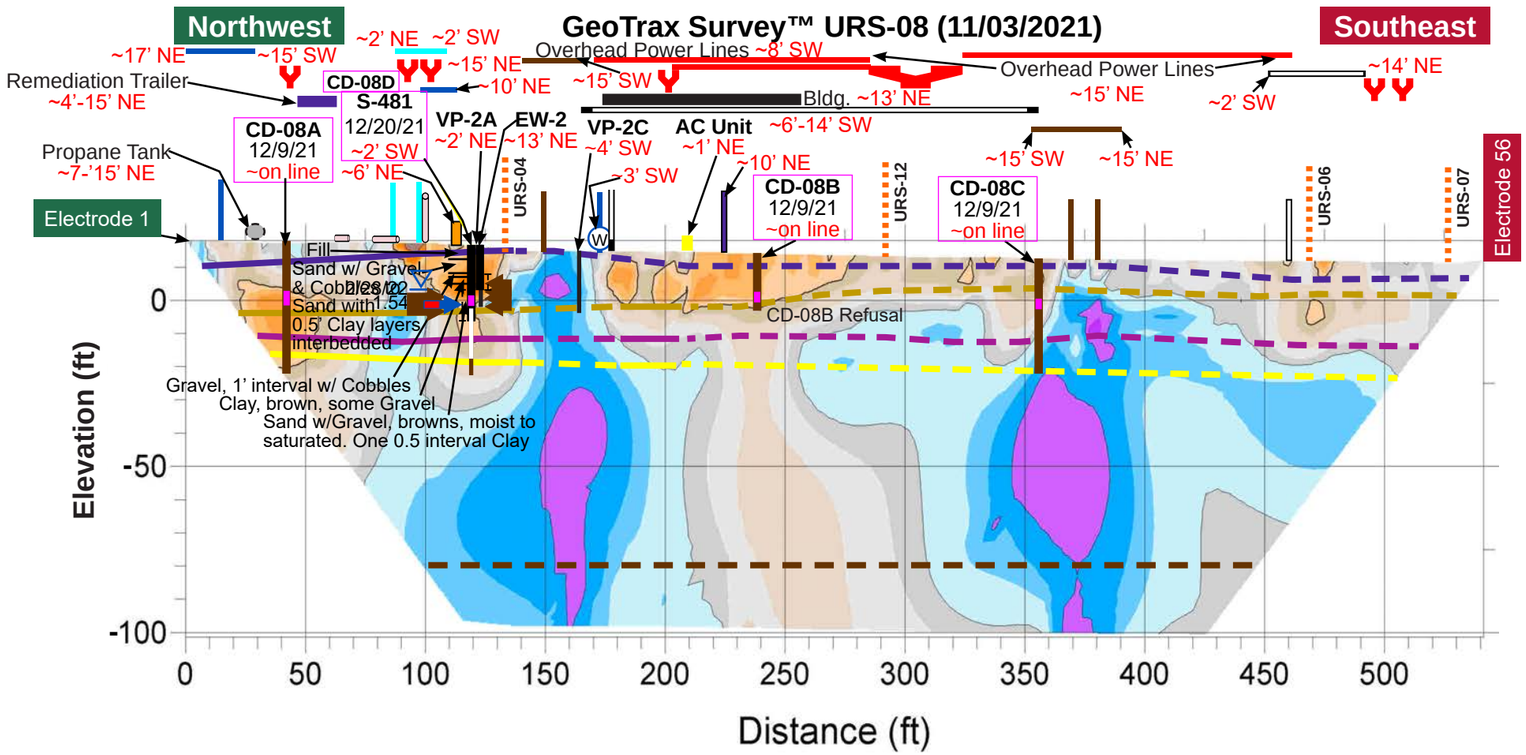
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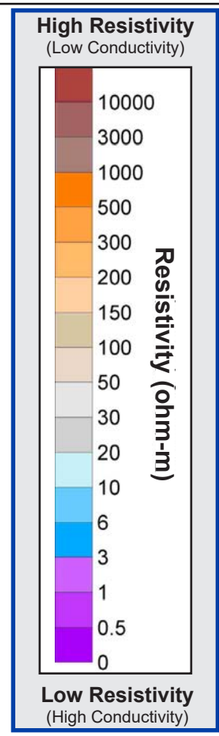


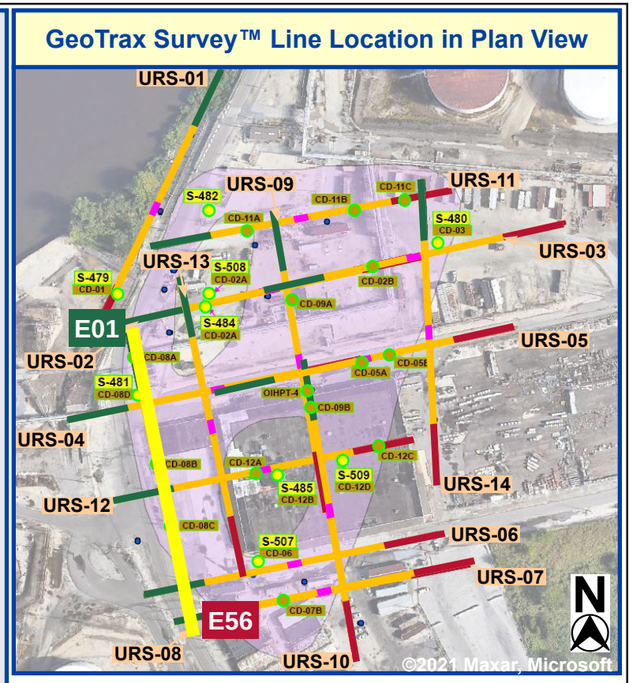


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Groundwater Sample Results		
Well		**S-481**
Sample Date		7/21/23
Parameters (µg/L)	***Standards (µg/L)***	
Benzene	5	**35,000**
Toluene	1,000	**25,000**
Ethyl Benzene	700	ND
Xylenes (total)	10,000	ND
Methyl tert-butyl ether	20	ND
Gasoline Range Organics	None	73,000
Petroleum Hydrocarbons C9 - C44	None	378 J

Groundwater Quality Sample Results		
Well		**S-481**
Sample Date		7/21/23
Parameters	***Units***	
Temperature	°C	24.78
pH	S.U.	7.05
Specific Cond.	mS/cm	0.142
Dissolved Oxygen	mg/L	1.73
ORP	mV	-64
Turbidity	NTU	258

Groundwater Metals, Ions, and Gasses	
Well	**S-481**
Sample Date	7/21/23
Parameters (µg/L)	
Calcium	17,700
Iron	2,380
Magnesium	3,040
Nitrate	ND
Potassium	2,270 J
Sodium	19,600
Bicarbonate Alkalinity	48,000
Carbon Dioxide	13,900
Chloride	23,100
Sulfate	13,000
Ethane	ND
Ethene	ND
Methane	2.71

Soil Sample Results					
Well	**VP-2A**				
Sample Date	**2/25/21**	**2/25/21**	**2/25/21**	**2/25/21**	**2/25/21**
Sample Depth (feet BGS)	**13**	**14**	**15**	**16**	**17**
Parameters (mg/kg)					
GRO	0.81 J	0.39 J	49,000	4,800	18,000
DRO (c10-c28)	ND	ND	29	8.3 J	6.1 J

Soil Sample Results				
Well	**S-481**			
Sample Date	12/20/21			
Sample Depth (feet BGS)	**16**	**17**	**18**	**19**
Parameters (mg/kg)				
>C12 to C22	19	6.5 J	ND	ND
>C22 to C44	12 J	5.9 J	ND	ND
Diesel Range Organics (C10-C28)	NA	NA	NA	NA
Gasoline Range Organics SW8015D	1.5	400	3,600	6,900
Total Petroleum Hydrocarbons C9-C44	NA	NA	NA	NA

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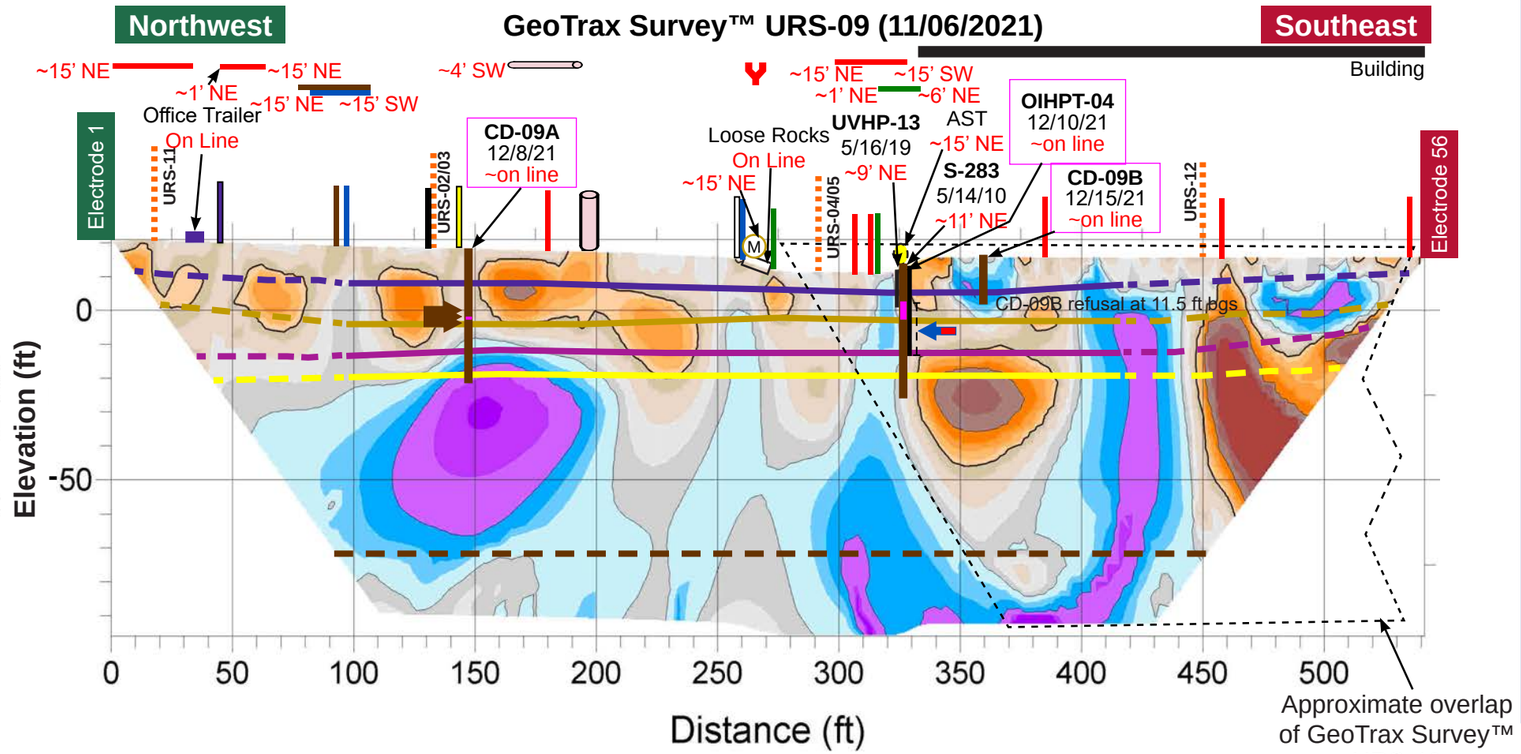
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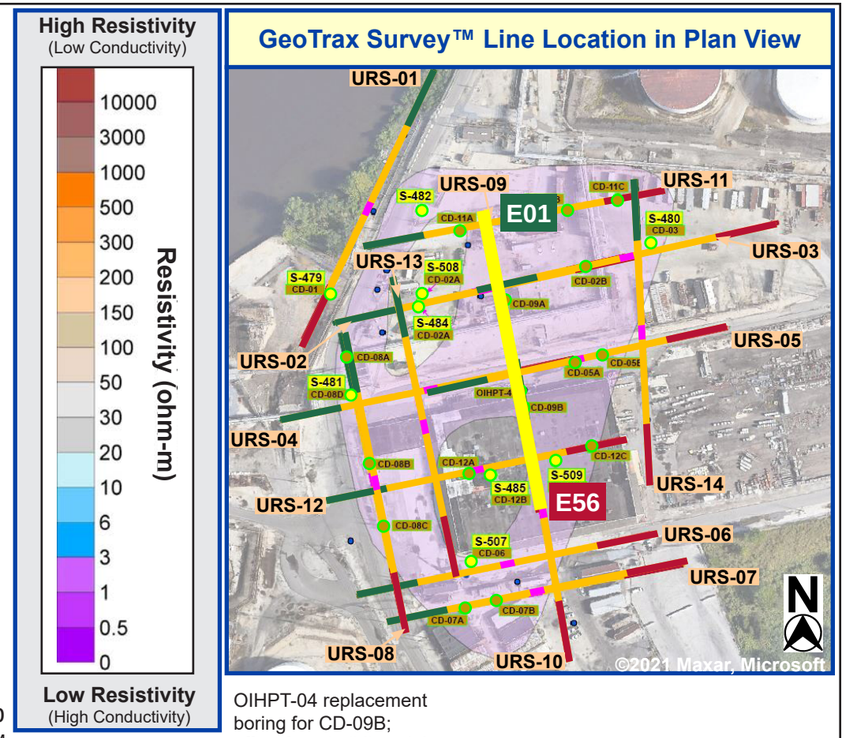
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FIGURE
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OIHPT-04 replacement boring for CD-09B; offset from building slab

Groundwater Sample Results		
Well		**S-283**
Sample Date		**2/26/19**
Parameters (µg/L)	***Standards (µg/L)***	
Benzene	5	**380,000**
Toluene	1,000	**84,000**
Ethylbenzene	700	97 J
Xylenes	10,000	240 J
Methyl Tertiary Butyl Ether	20	ND

Groundwater Quality Sample Results		
Well		**S-283**
Sample Date		**2/26/19**
Parameters	***Units***	
Temperature	°C	14.87
pH	S.U.	7.01
Specific Cond.	mS/cm	0.4
Dissolved Oxygen	mg/L	0.35
ORP	mV	-10

Soil Sample Results			
Well	**CD-09A**		
Sample Date	12/21/21		
Sample Depth (feet BGS)	**19**	**20**	**21**
Parameters (mg/kg)			
>C12 to C22	4,200	3,900	11,000
>C22 to C44	140	120 J	300 J
Diesel Range Organics (C10-C28)	NA	NA	NA
Gasoline Range Organics SW8015D	19,000	22,000	4,200
Total Petroleum Hydrocarbons C9-C44	NA	NA	NA

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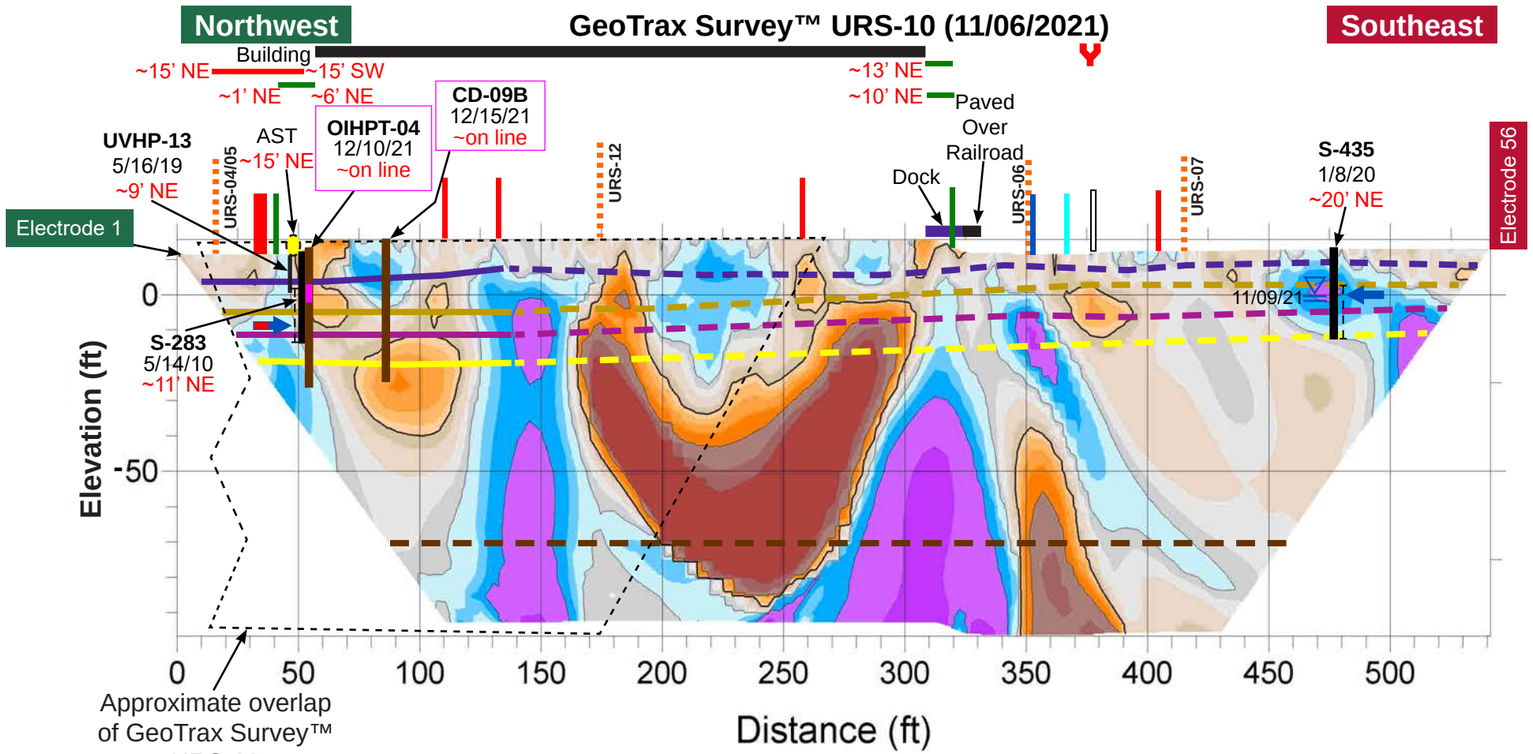
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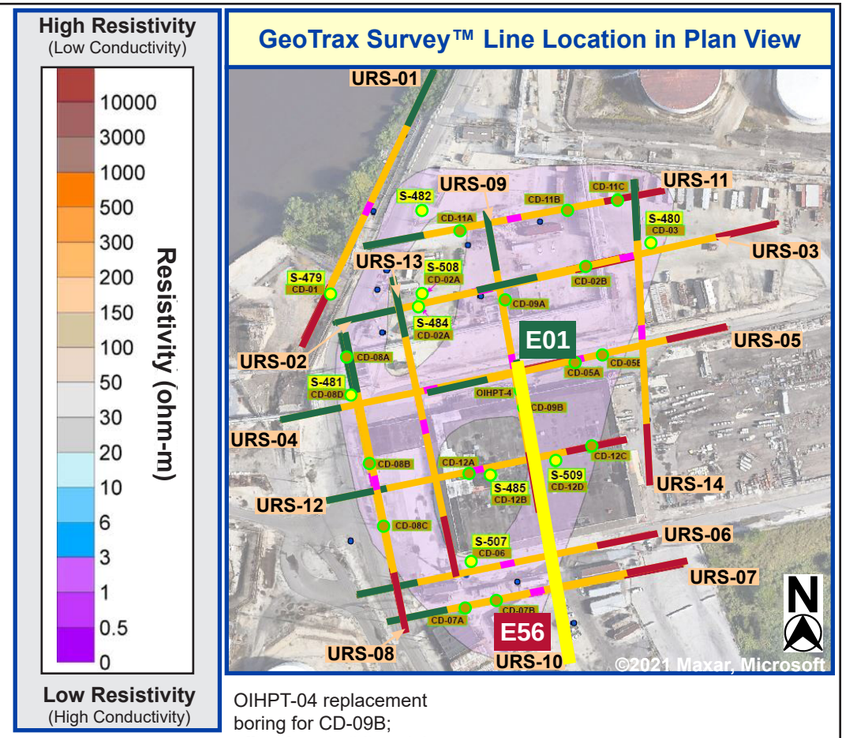
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FIGURE
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OIHPT-04 replacement boring for CD-09B; offset from building slab

Groundwater Sample Results			
Well		**S-283**	**S-435**
Sample Date		**2/26/19**	**9/9/20**
Parameters (µg/L)	***Standards (µg/L)***		
Benzene	5	**380,000**	0.63 J
Toluene	1,000	**84,000**	ND
Ethylbenzene	700	97 J	ND
Xylenes	10,000	240 J	ND
Methyl Tertiary Butyl Ether	20	ND	ND

Groundwater Quality Sample Results			
Well		**S-283**	**S-435**
Sample Date		**2/26/19**	**9/9/20**
Parameters	***Units***		
Temperature	°C	14.87	20.86
pH	S.U.	7.01	7.28
Specific Cond.	mS/cm	0.4	2.09
Dissolved Oxygen	mg/L	0.35	0.27
ORP	mV	-10	32

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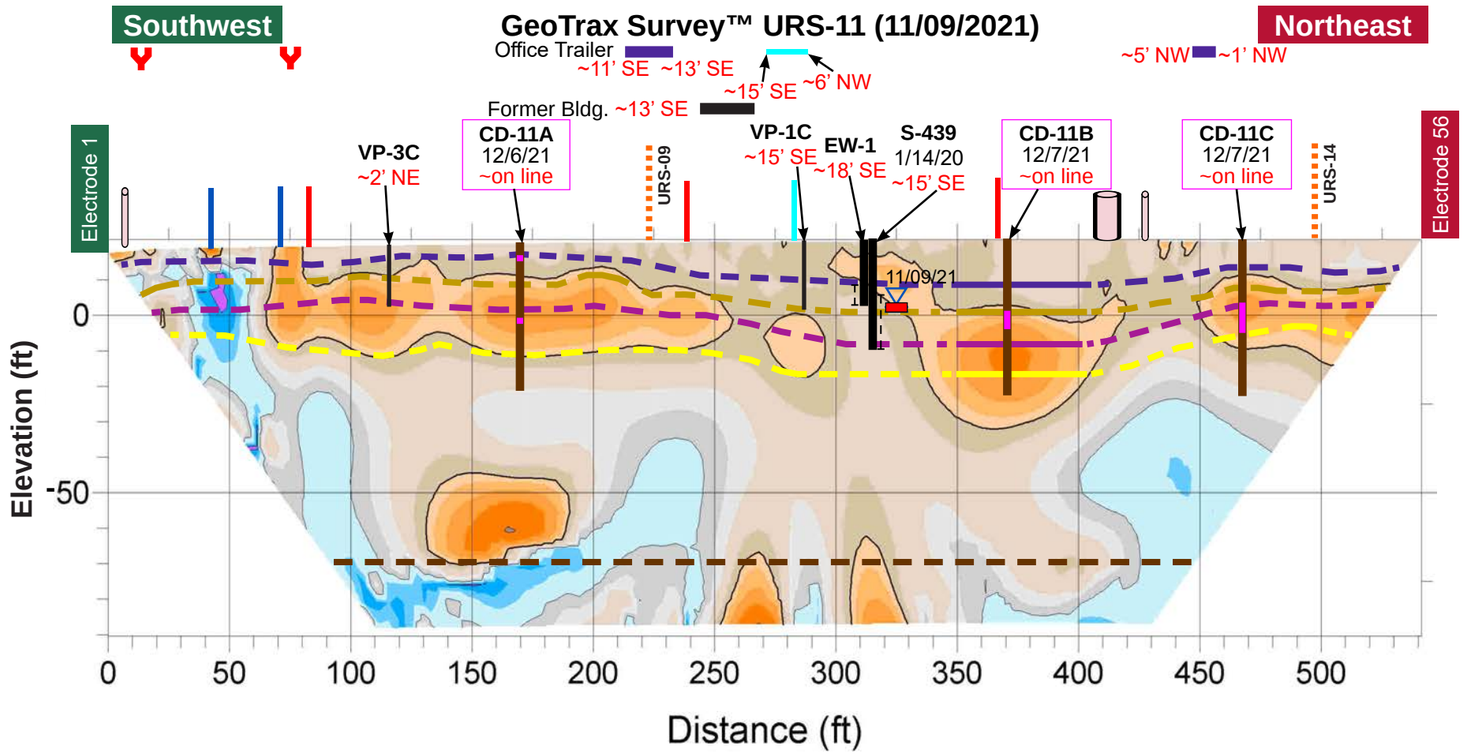
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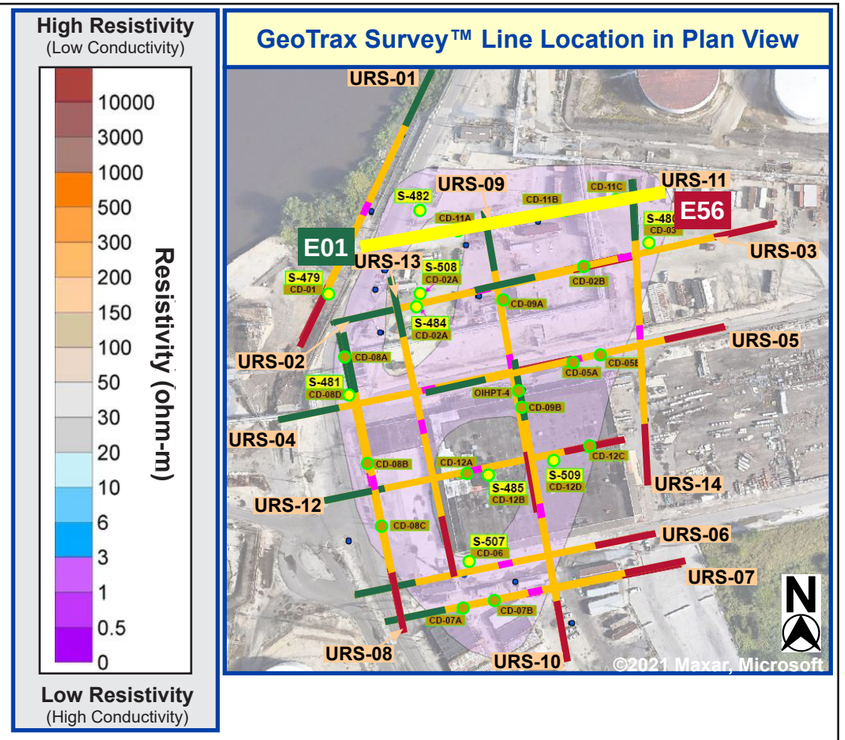
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FIGURE
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Groundwater Sample Results		
Well		**S-439**
Sample Date		
Parameters (µg/L)	***Standards (µg/L)***	
Benzene	5	Free Product Present
Toluene	1,000	
Ethylbenzene	700	
Xylenes	10,000	
Methyl Tertiary Butyl Ether	20	

Groundwater Quality Sample Results		
Well		**S-439**
Sample Date		
Parameters	***Units***	
Temperature	°C	Free Product Present
pH	S.U.	
Specific Cond.	mS/cm	
Dissolved Oxygen	mg/L	
ORP	mV	

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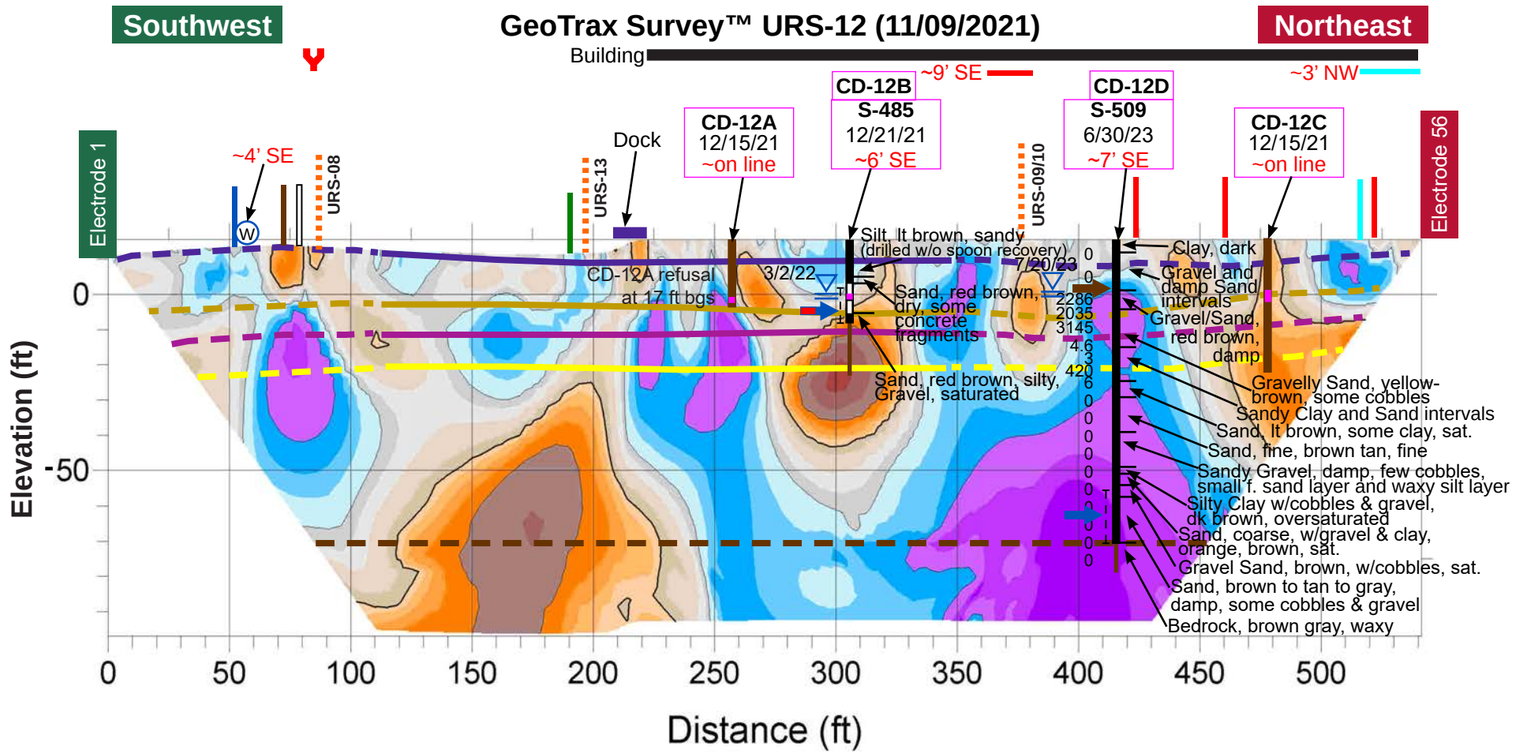
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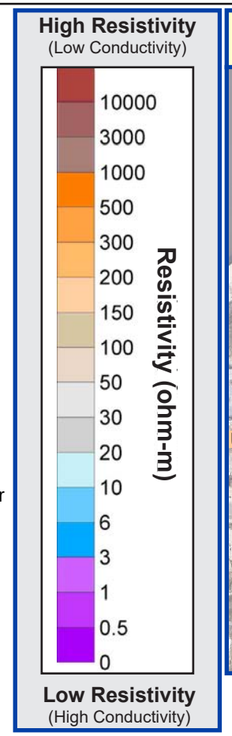
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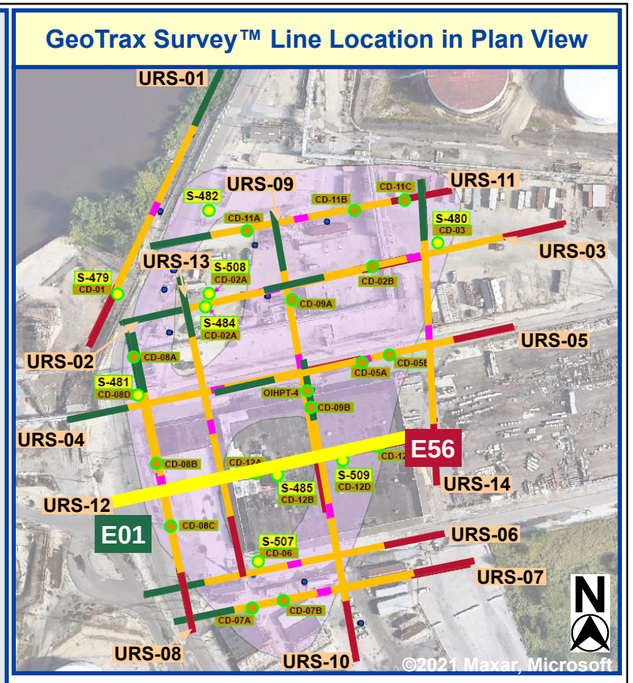
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FIGURE
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Groundwater Sample Results

Well		S-485	S-509
Sample Date		7/20/23	7/20/23
Parameters (µg/L)	*Stds (µg/L)*		
Benzene	5	**400**	2.8
Toluene	1,000	810	0.36 J
Ethyl Benzene	700	2.1 J	ND
Xylenes (total)	10,000	11.3 J	ND
Methyl tert-butyl ether	20	ND	ND
Gasoline Range Organics	None	3,800	30 J
Petroleum Hydrocarbons C9 - C44	None	190 J	210 J

Groundwater Quality Sample Results

Well		S-485	S-509
Sample Date		7/20/23	7/20/23
Parameters	*Units*		
Temperature	°C	22.57	18.69
pH	S.U.	7	6.95
Specific Cond.	mS/cm	0.123	1.02
Dissolved Oxygen	mg/L	2.7	0
ORP	mV	21	-58
Turbidity	NTU	51.8	28.8

Groundwater Metals, Ions, and Gasses

Well	S-485	S-509
Sample Date	7/20/23	7/20/23
Parameters (µg/L)		
Calcium	15,200	72,800
Iron	353	10,100
Magnesium	768	47,800
Nitrate	174	ND
Potassium	5,100	9,990
Sodium	9,630	67,700
Bicarbonate Alkalinity	49,600	336,000
Carbon Dioxide	29,400	122,000
Chloride	1,470	103,000
Sulfate	21,300	191,000
Ethane	ND	1.32
Ethene	ND	ND
Methane	2.84	22.5

Soil Sample Results

Well	S-509
Sample Date	6/28/23
Sample Depth (feet BGS)	14.8
Parameters (mg/kg)	
>C12 to C22	NA
>C22 to C44	NA
Diesel Range Organics (C10-C28)	NA
Gasoline Range Organics SW8015D	0.59
Total Petroleum Hydrocarbons C9-C44	5.55

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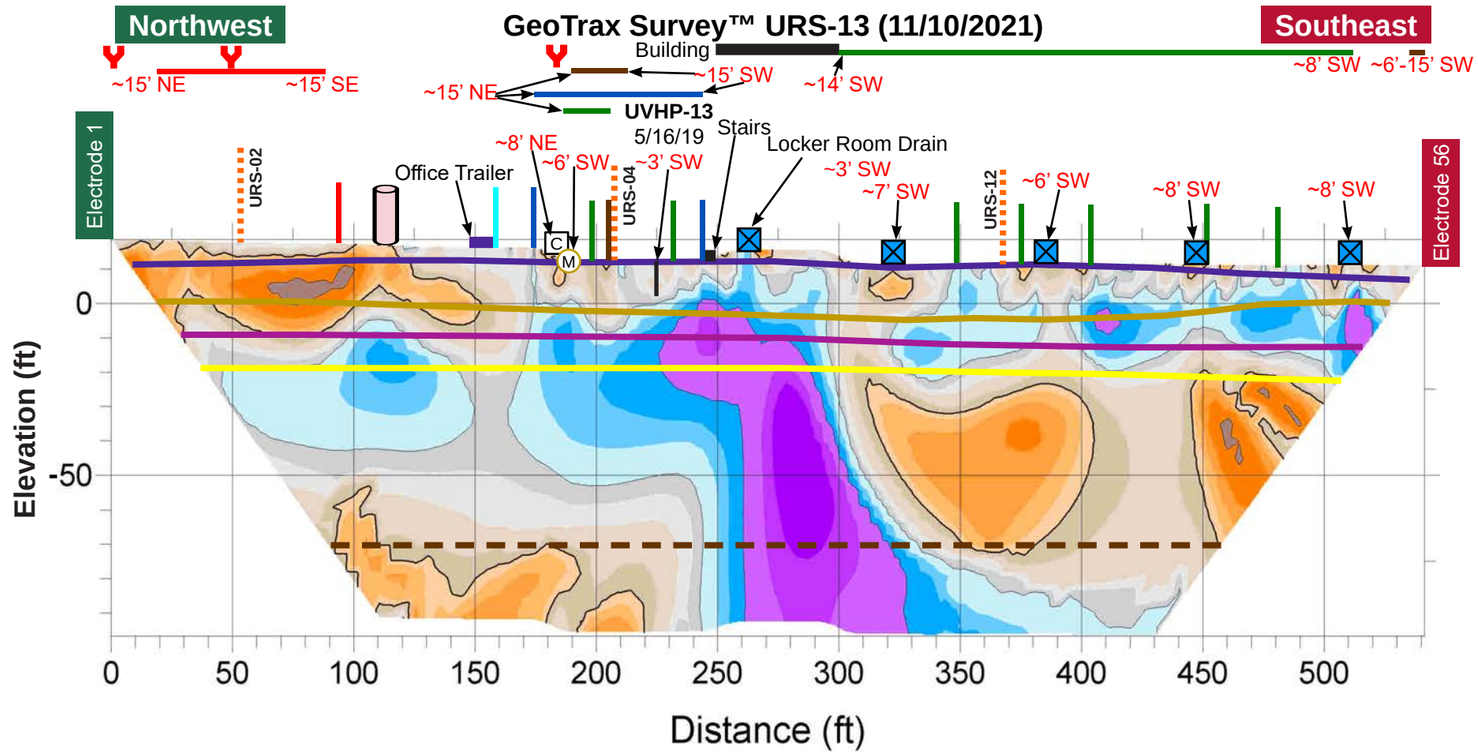
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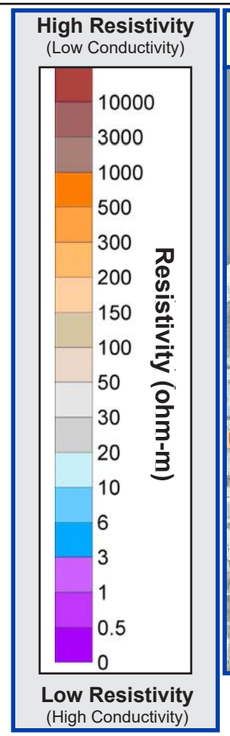
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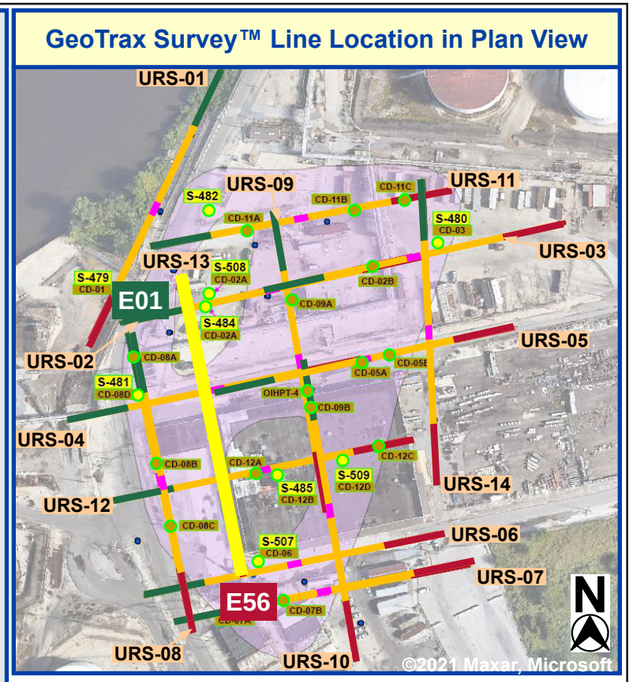
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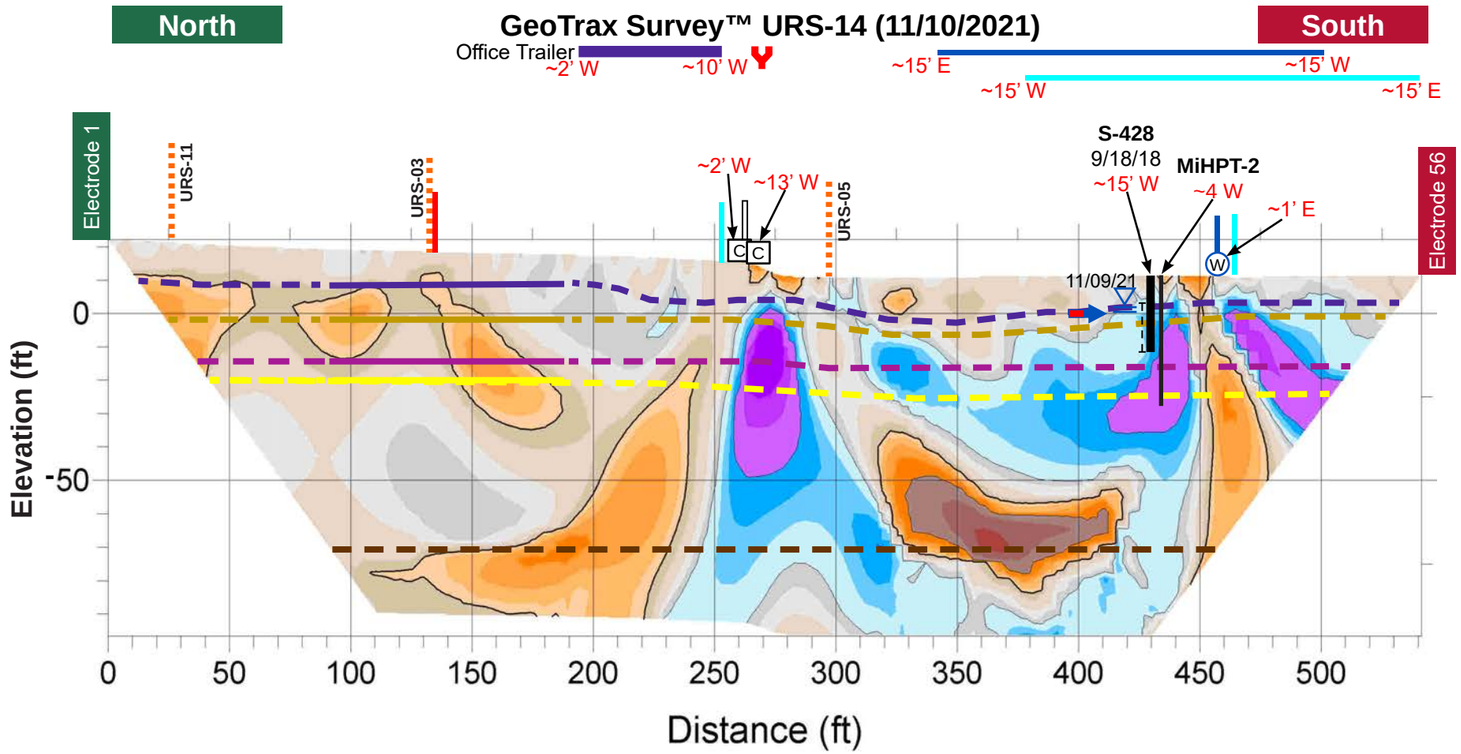


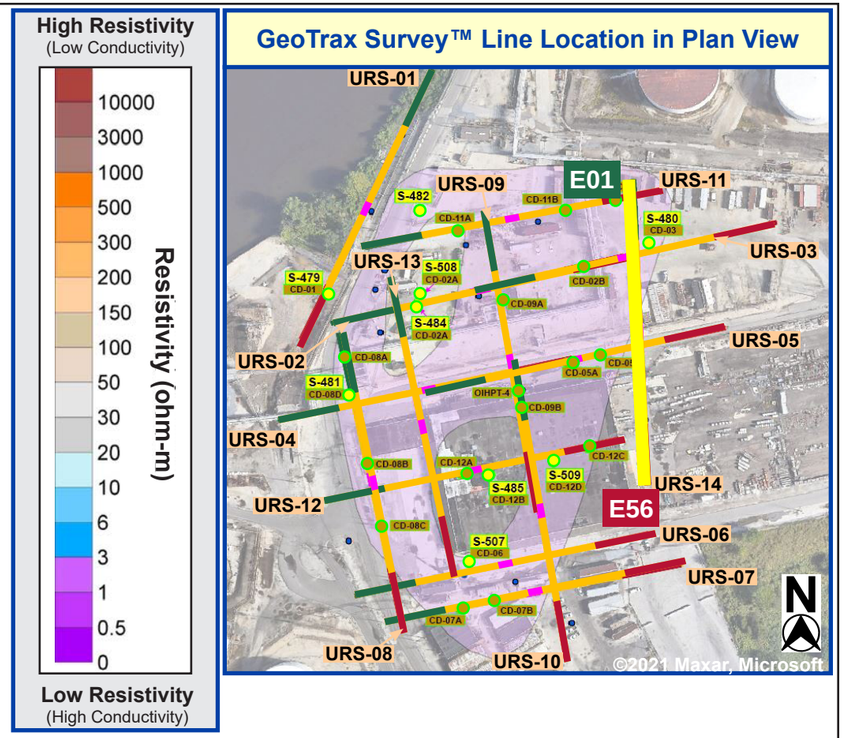


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FIGURE
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Groundwater Sample Results		
Well		**S-428**
Sample Date		9/3/20
Parameters (µg/L)	***Standards (µg/L)***	
Benzene	5	**210**
Toluene	1,000	0.66 J
Ethylbenzene	700	2.4
Xylenes	10,000	5.6 J
Methyl Tertiary Butyl Ether	20	ND

Groundwater Quality Sample Results		
Well		**S-428**
Sample Date		**9/3/20**
Parameters	***Units***	
Temperature	°C	27.99
pH	S.U.	5.74
Specific Cond.	mS/cm	0.598
Dissolved Oxygen	mg/L	6.64
ORP	mV	NS

Groundwater Metals and Ions		
Well		**S-428**
Sample Date		
Parameters	***Units***	
Calcium	µg/L	NS
Ethane	µg/L	NS
Ethene	µg/L	NS
Fluorene	µg/L	NS
Iron	µg/L	NS
Lead	µg/L	NS
Methane	µg/L	NS
Sulfate (as SO4)	µg/L	NS
Total Carbon	µg/L	NS

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FIGURE
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Representative Site Photos









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GeoTrax Survey™ Line Properties and Endpoint Electrode Land Survey Coordinates
UDEX Release Site
Philadelphia, PA

Survey ID	Electrode Spacing	Line Length (ft)	Image Depth (ft)	Survey Date	Coordinate System and Datum	Electrode 1				Electrode 56			
						Easting (ft)	Northing (ft)	Elevation (ft)	Endpoint Marker Type[1]	Easting (ft)	Northing (ft)	Elevation (ft)	Endpoint Marker Type[1]
URS-01	3.00	541	108	11/7/2021	NAD 1983 2011 State Plane Pennsylvania South, FIPS 3702, Ft, US	2,682,343.03	220,879.39	9.16	plastic	2,682,107.97	220,391.96	7.80	plastic
URS-02	3.00	541	108	11/8/2021		2,682,162.25	220,423.90	18.23	brass	2,682,689.90	220,544.42	18.60	brass
URS-03	3.00	541	108	11/8/2021		2,682,431.03	220,485.24	18.39	brass	2,682,958.67	220,605.76	17.02	brass
URS-04	3.00	541	108	11/5/2021		2,682,067.84	220,247.76	12.23	brass	2,682,597.23	220,360.20	11.29	brass
URS-05	3.00	541	108	11/5/2021		2,682,337.44	220,304.79	11.98	brass	2,682,866.95	220,417.21	9.88	brass
URS-06	3.00	541	108	11/4/2021		2,682,202.16	219,933.01	10.16	brass	2,682,731.48	220,046.24	11.57	brass
URS-07	3.00	541	108	11/7/2021		2,682,259.82	219,885.30	10.58	brass	2,682,790.77	219,990.38	12.90	brass
URS-08	3.00	541	108	11/3/2021		2,682,172.72	220,405.52	18.04	brass	2,682,287.86	219,876.43	11.78	brass
URS-09	3.00	541	108	11/6/2021		2,682,434.31	220,622.86	20.97	brass	2,682,532.78	220,090.41	15.57	brass
URS-10	3.00	541	108	11/6/2021		2,682,484.51	220,351.95	11.50	brass	2,682,583.09	219,819.54	13.12	brass
URS-11	3.00	541	108	11/9/2021		2,682,218.01	220,561.82	17.67	brass	2,682,749.53	220,664.90	21.41	brass
URS-12	3.00	541	108	11/9/2021		2,682,148.60	220,102.70	11.10	brass	2,682,678.17	220,214.64	15.56	brass
URS-13	3.00	541	108	11/10/2021		2,682,262.58	220,501.64	18.63	brass	2,682,379.76	219,972.86	11.24	brass
URS-14	3.00	541	108	11/10/2021		2,682,704.70	220,681.57	22.19	brass	2,682,728.37	220,140.74	11.34	brass

Notes:

1. GeoTrax Survey™ Endpoint Types (for Electrodes 1 and 56):

Brass Marker

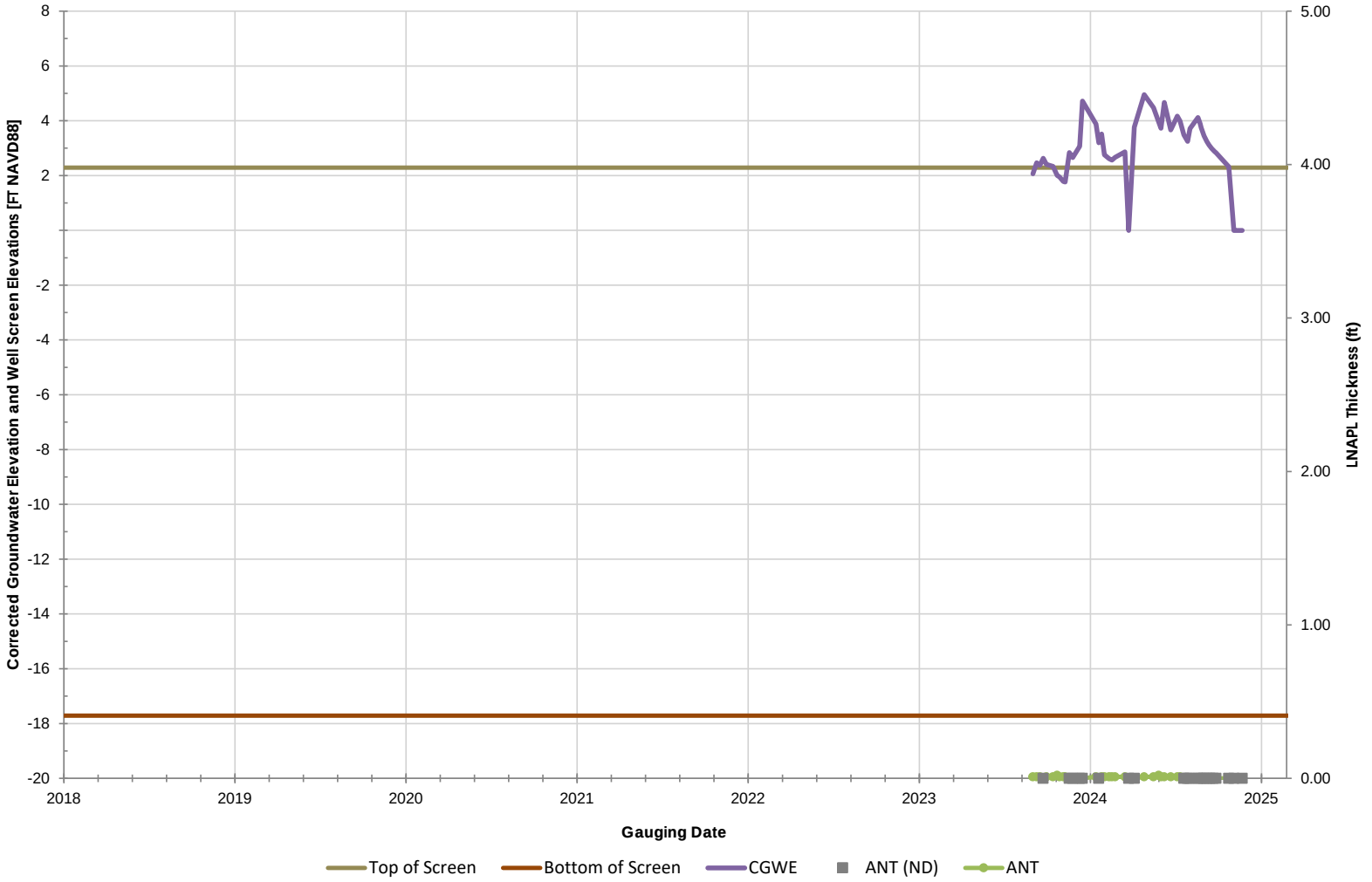


Plastic Marker



Aestus

Appendix I Well Hydrographs



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

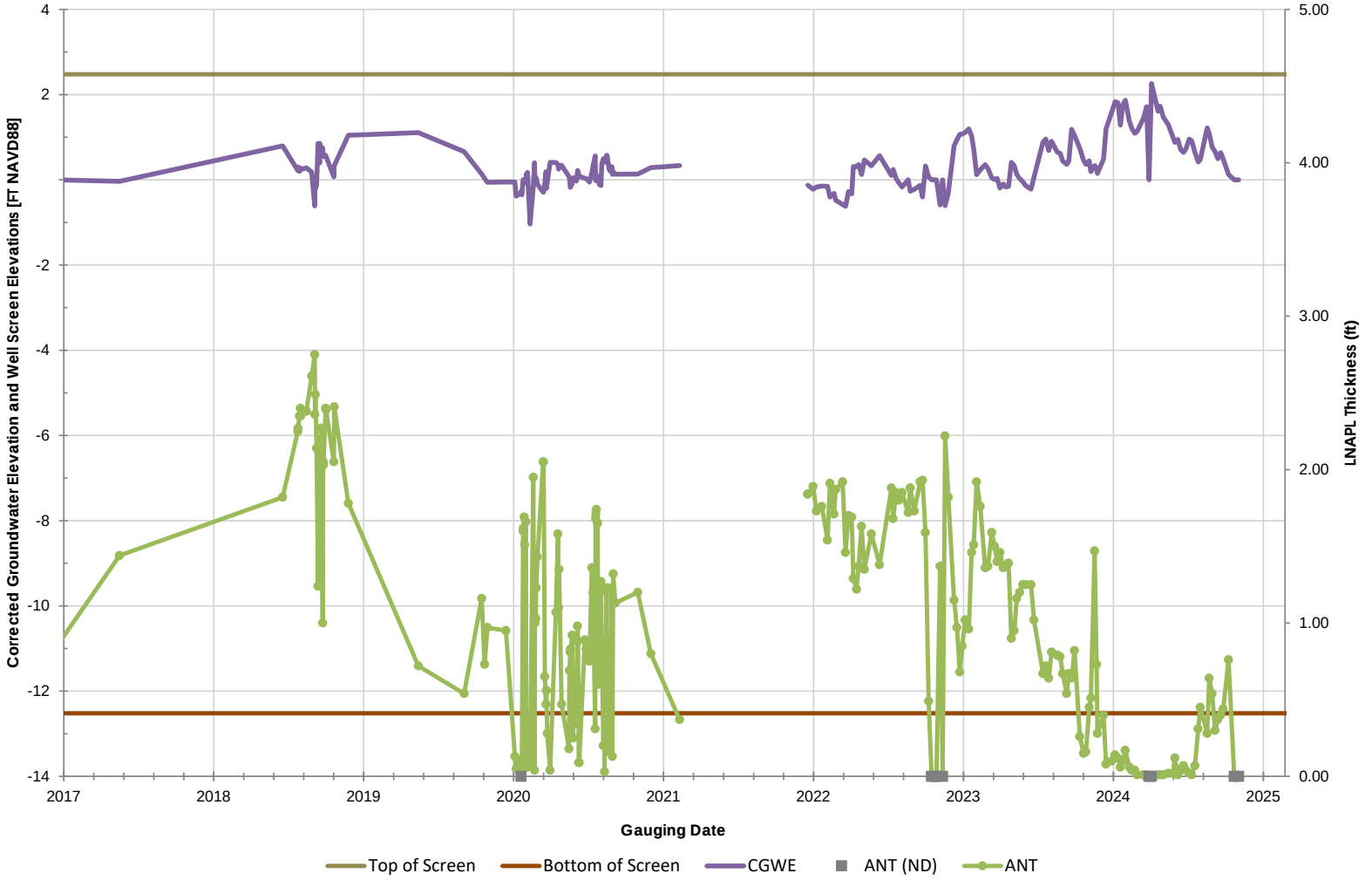
Figure/Well No.

C-169

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

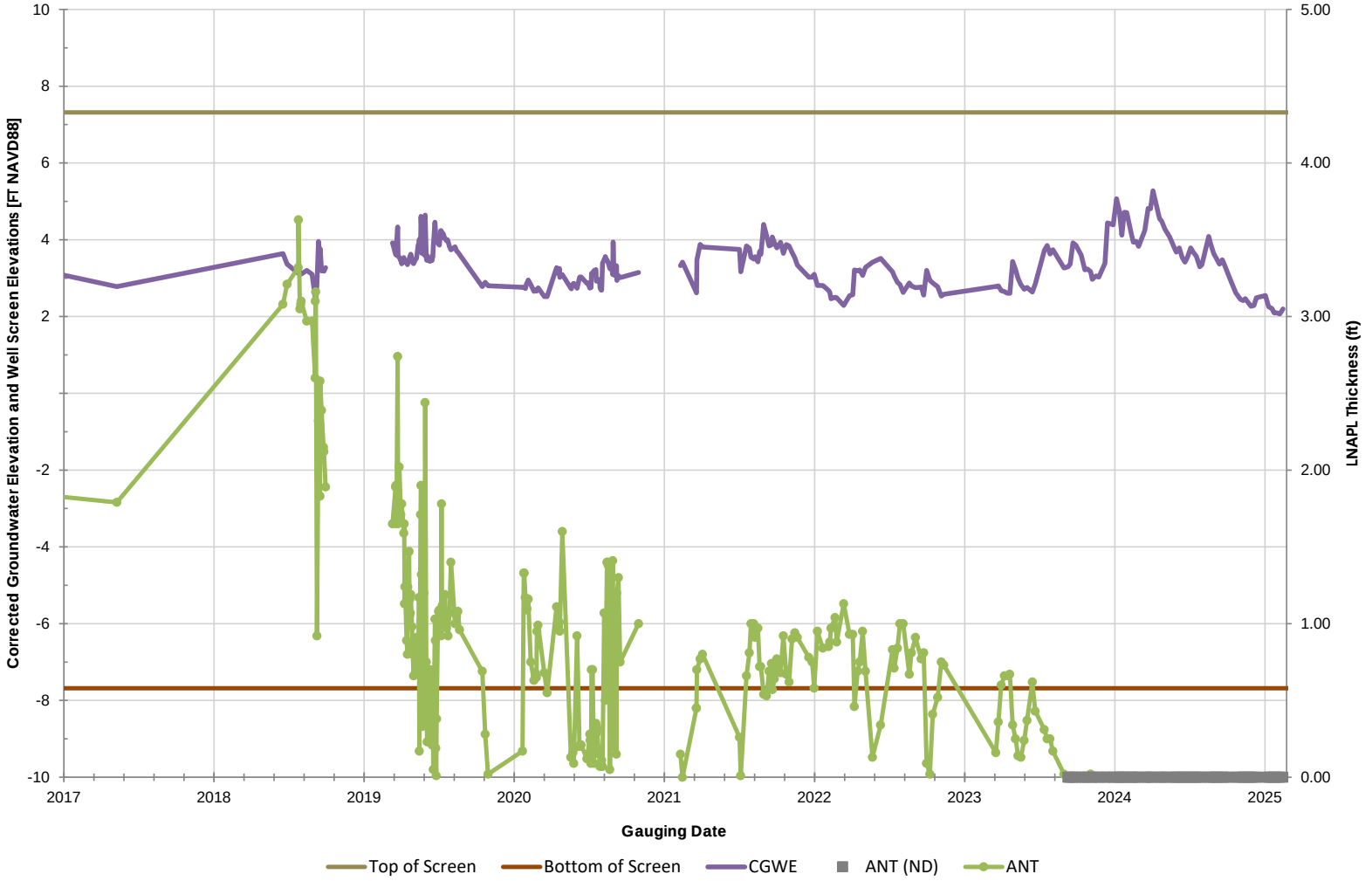
Figure/Well No.

S-283

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

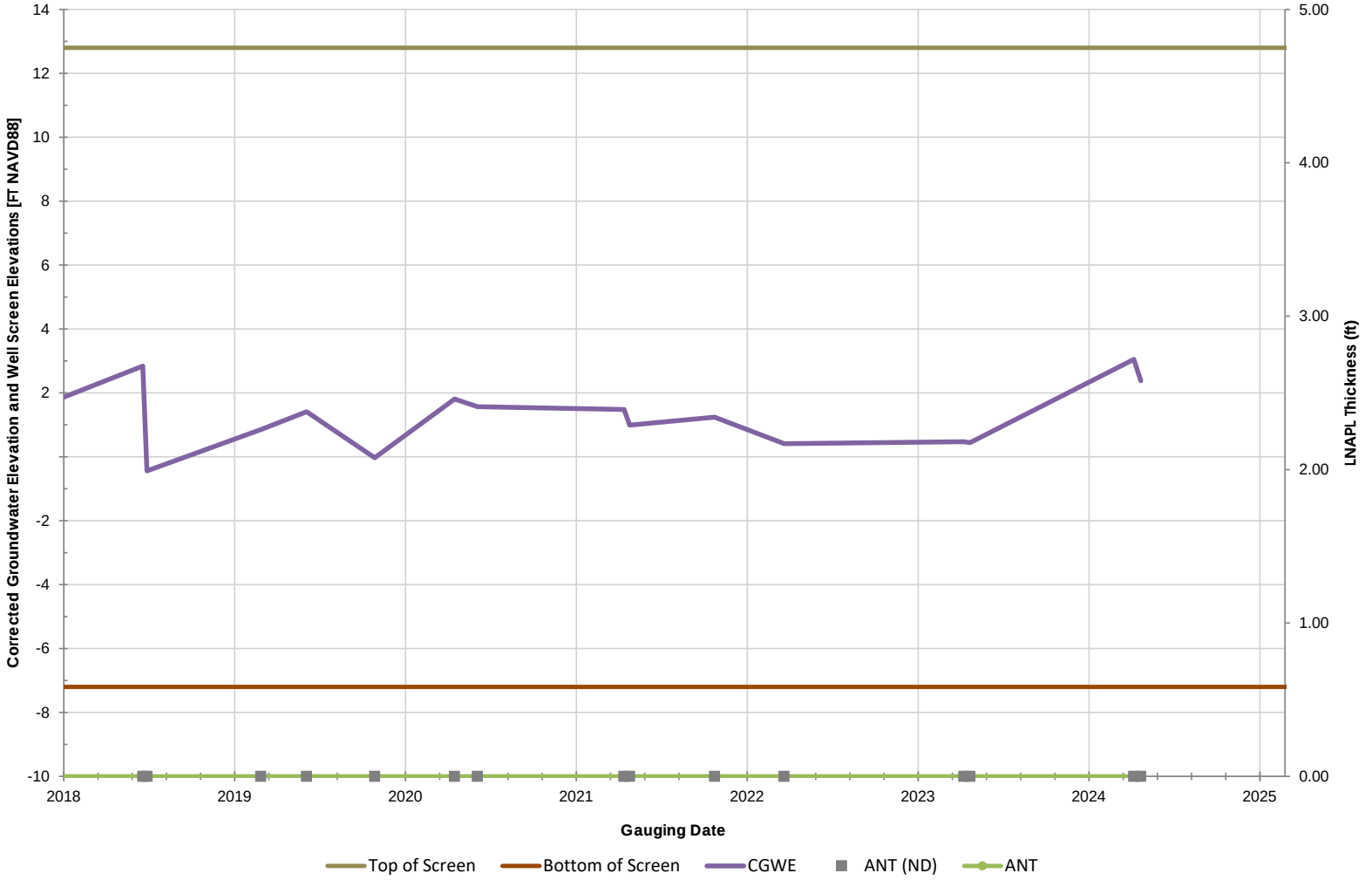
Figure/Well No.

S-382

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

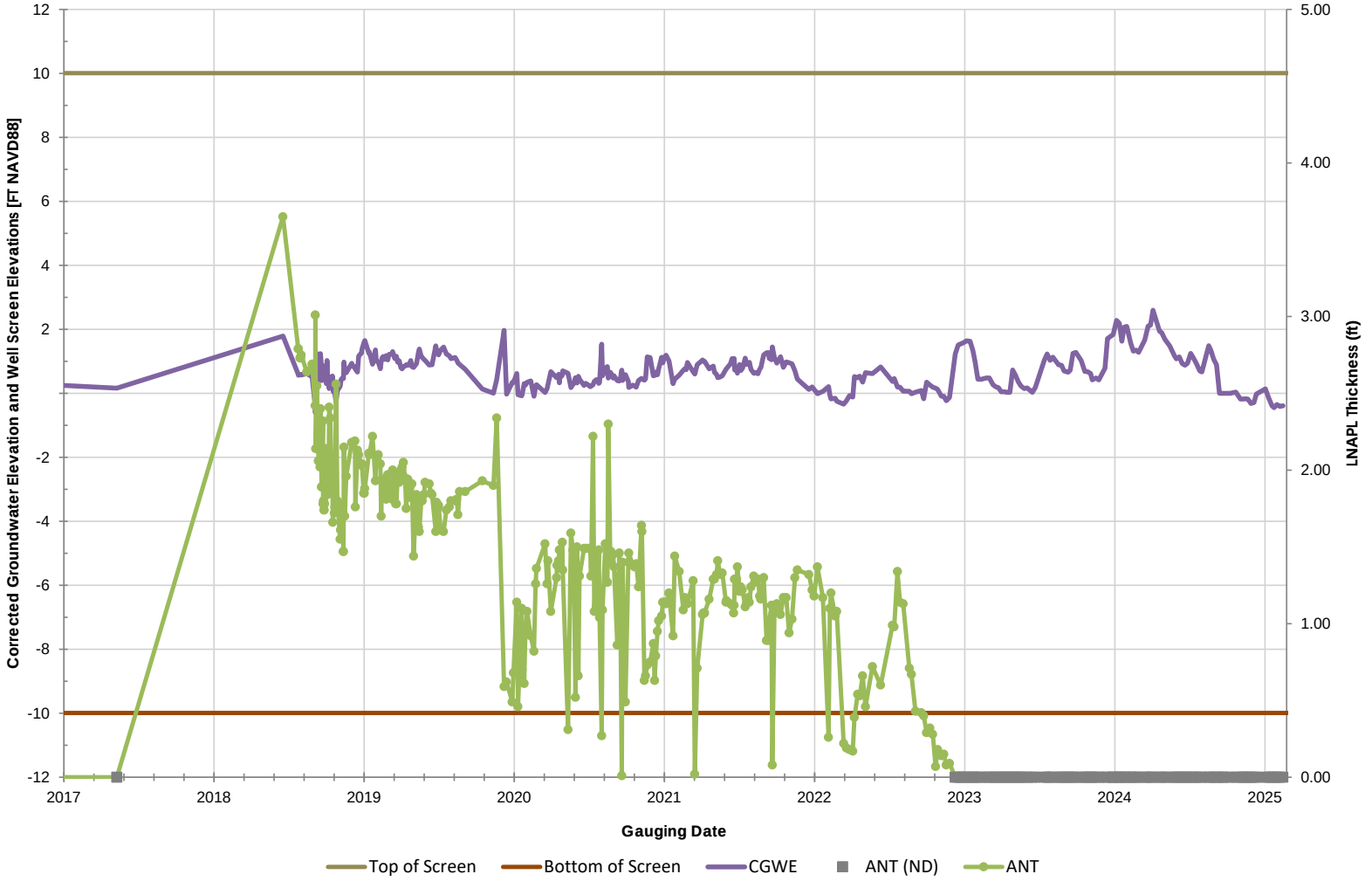
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S-411

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

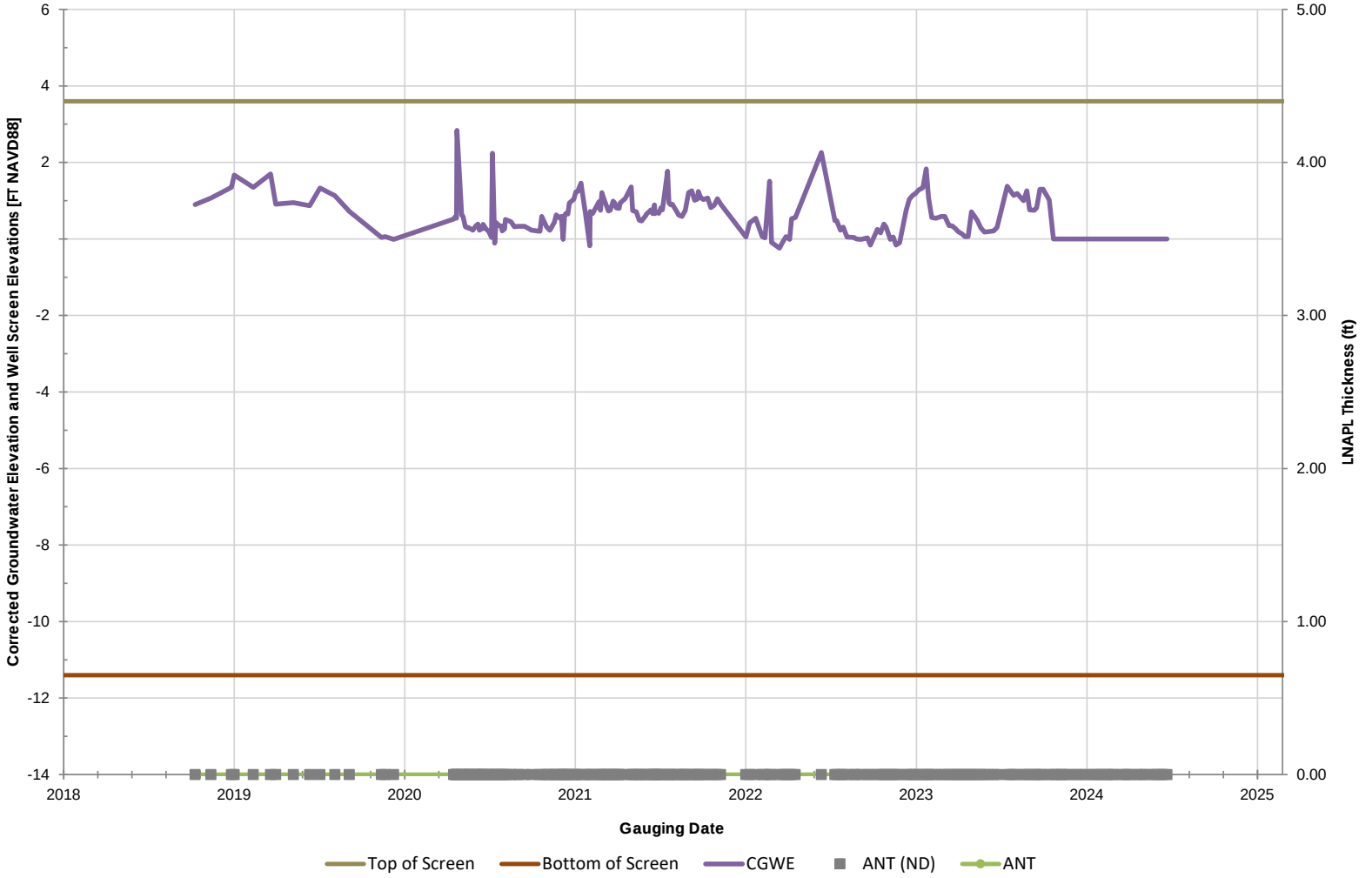
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S-414

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

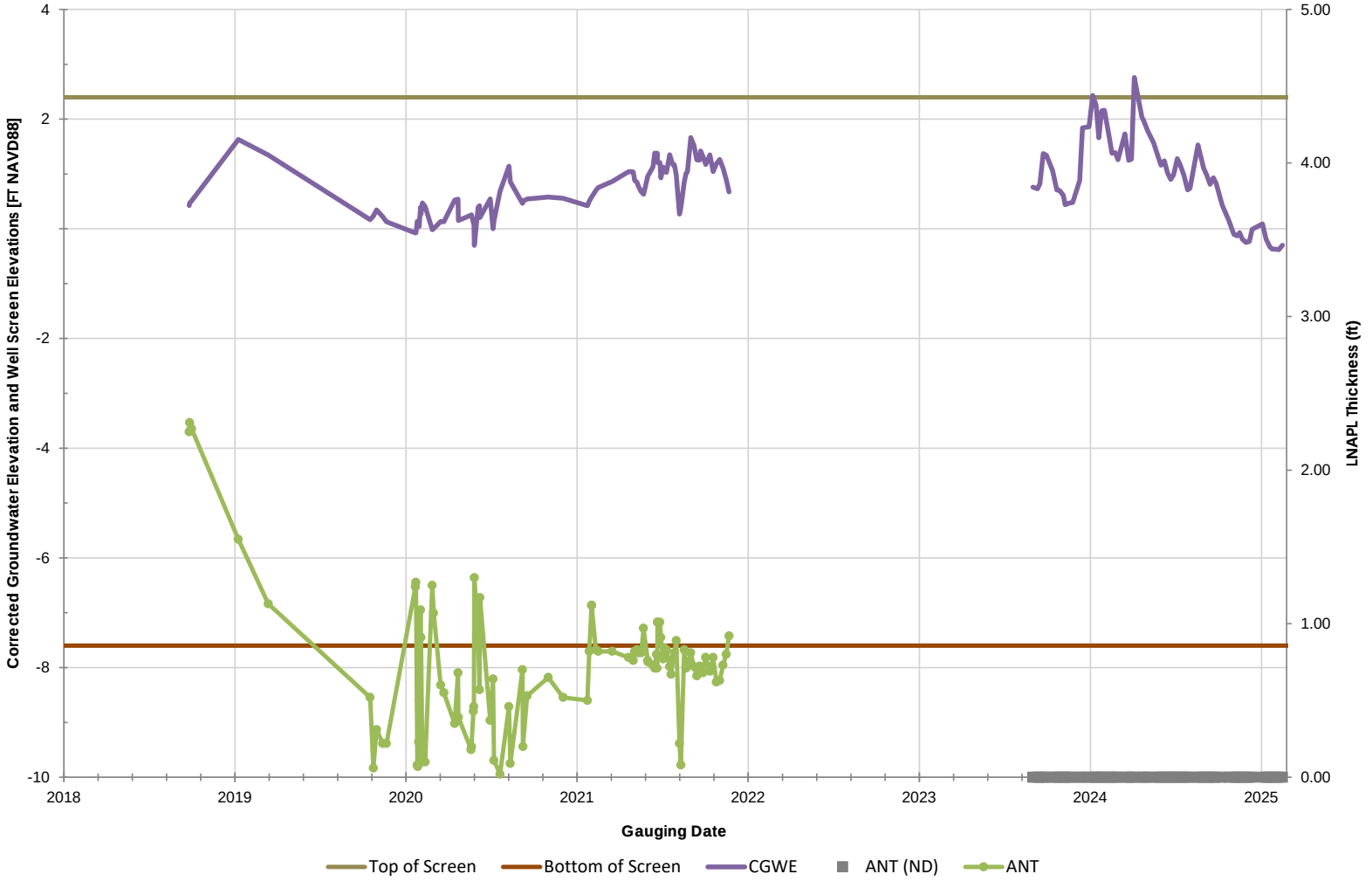
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S-428

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

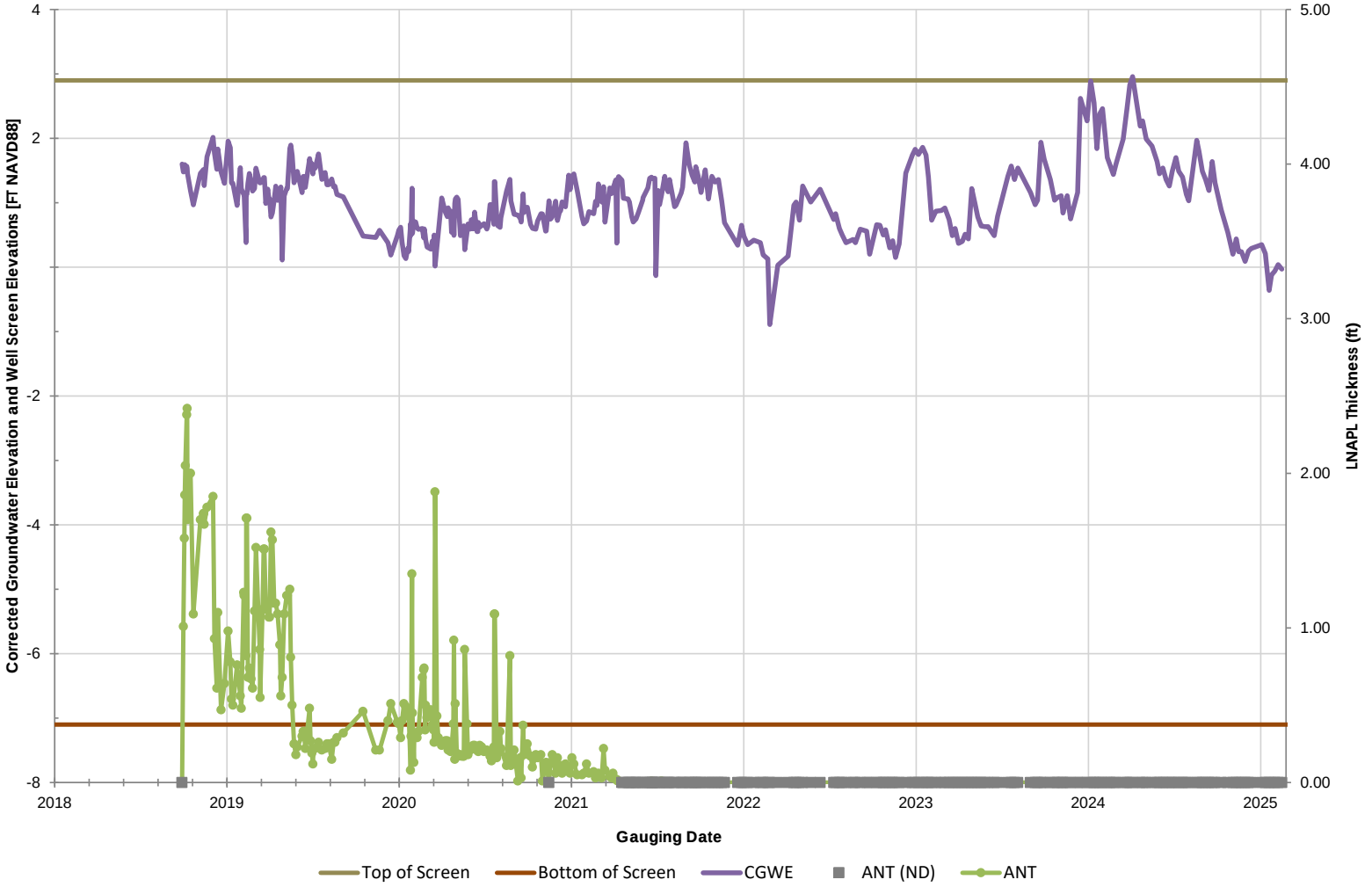
Figure/Well No.

S-429

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

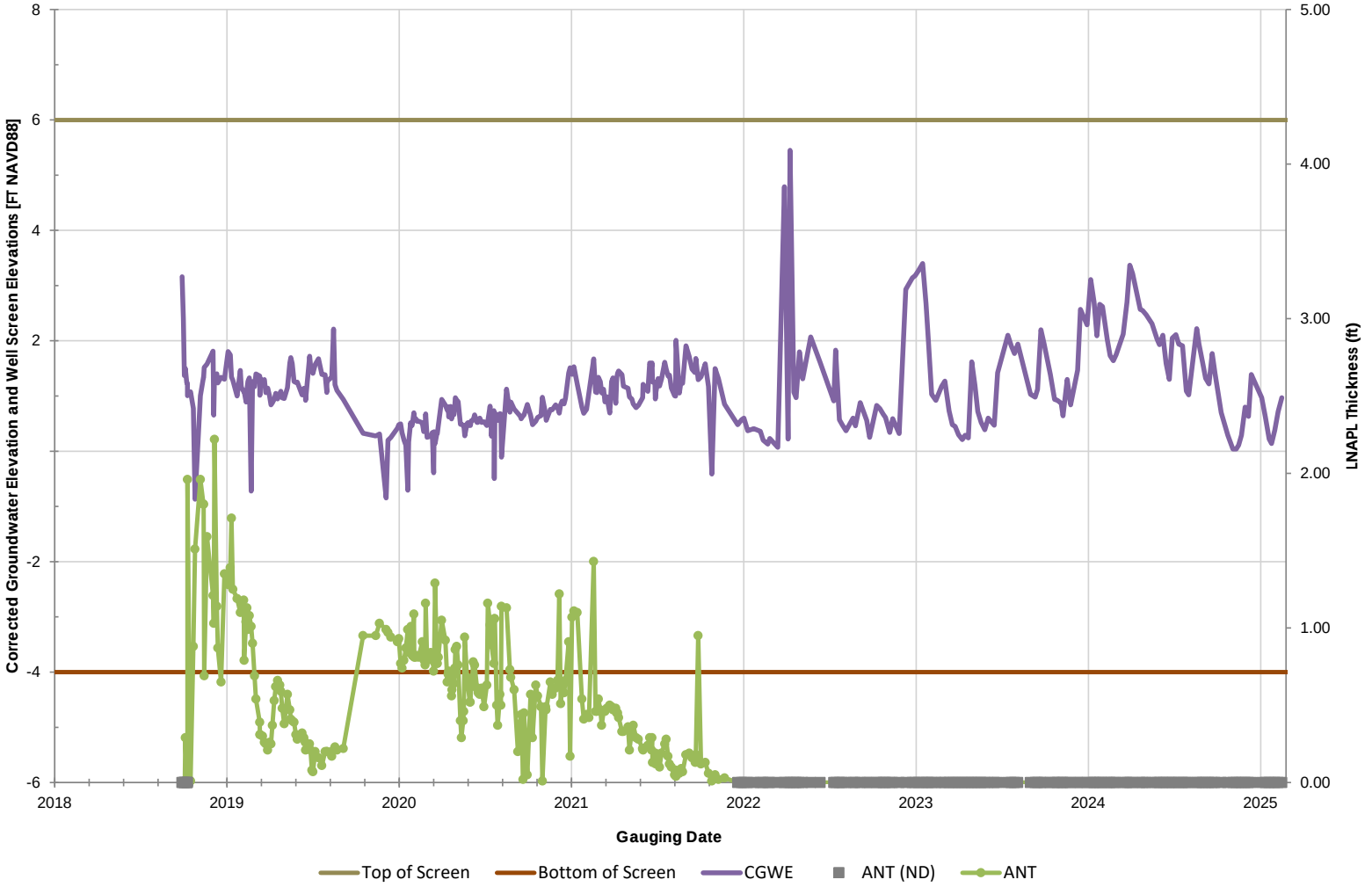
Figure/Well No.

S-430

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

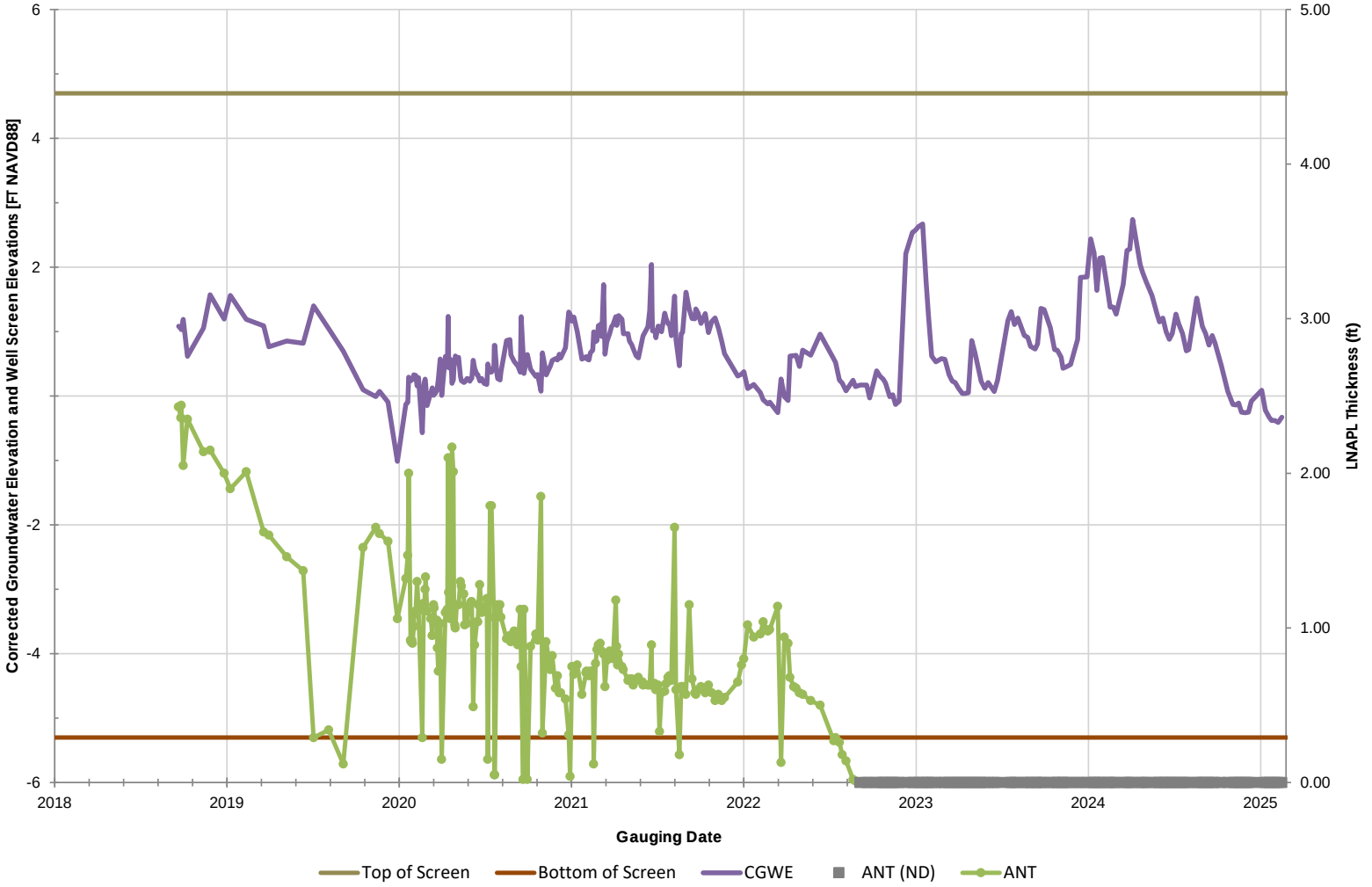
Figure/Well No.

S-431

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

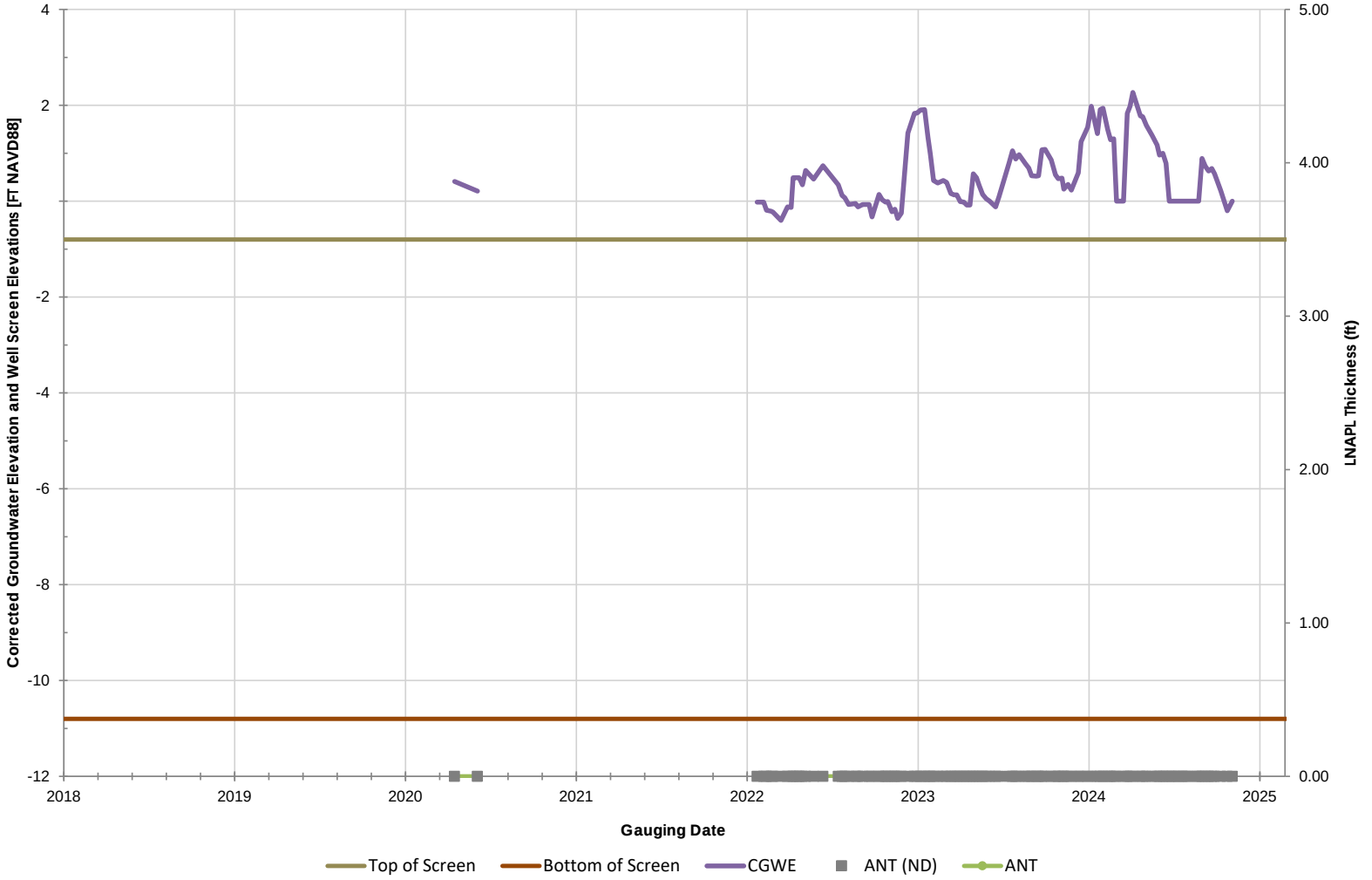
Figure/Well No.

S-432

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

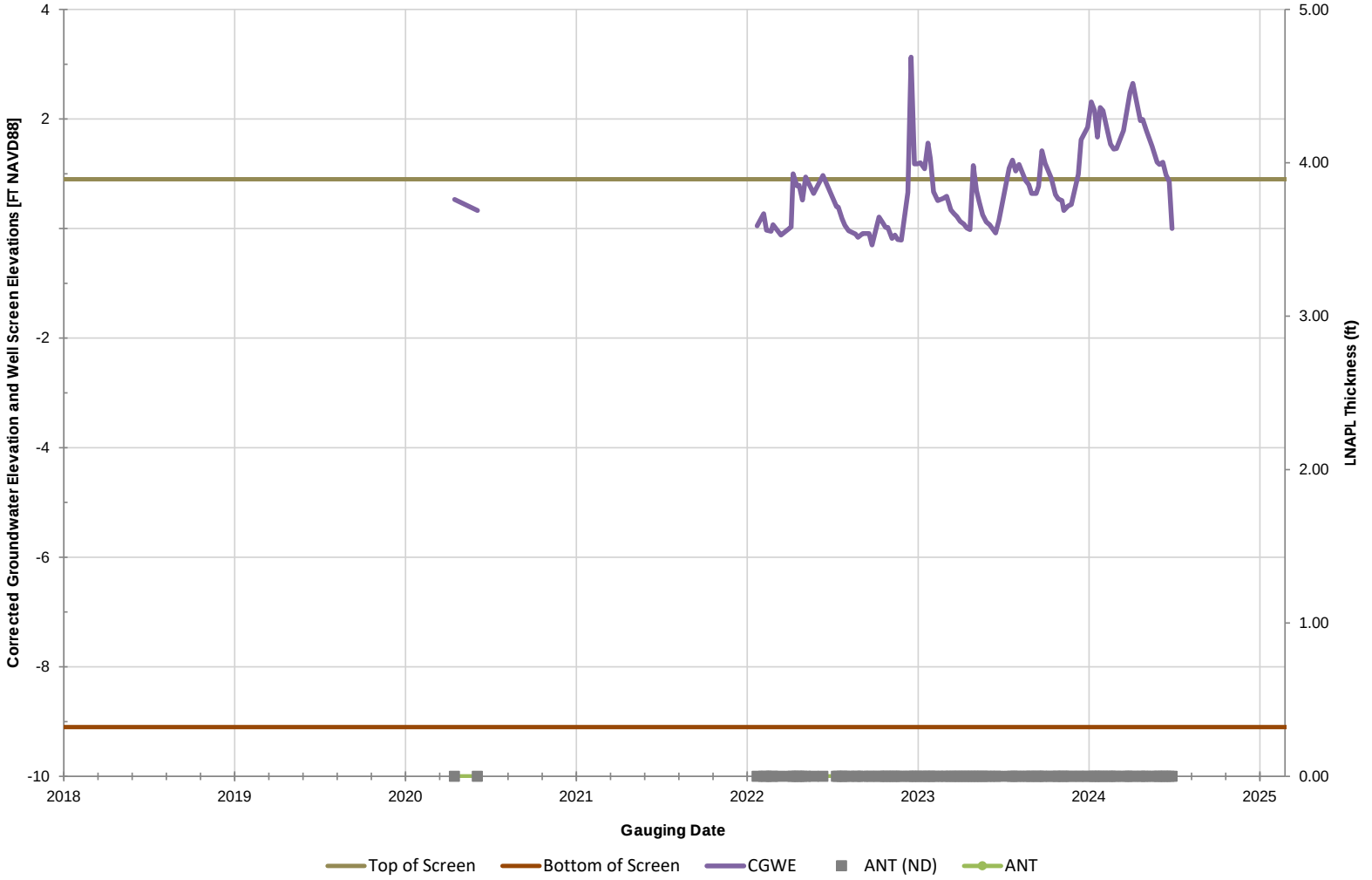
Figure/Well No.

S-433

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

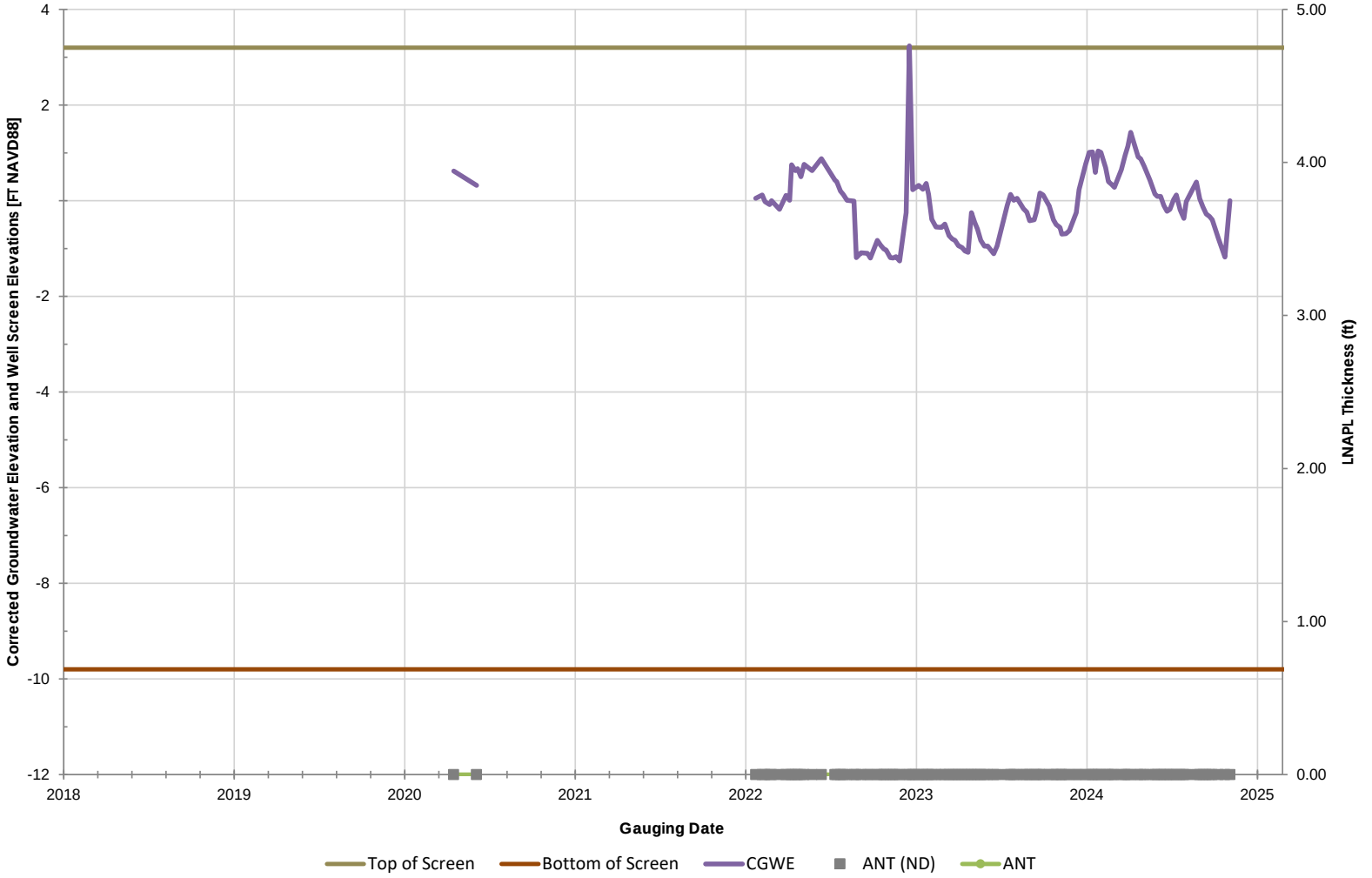
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S-434

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

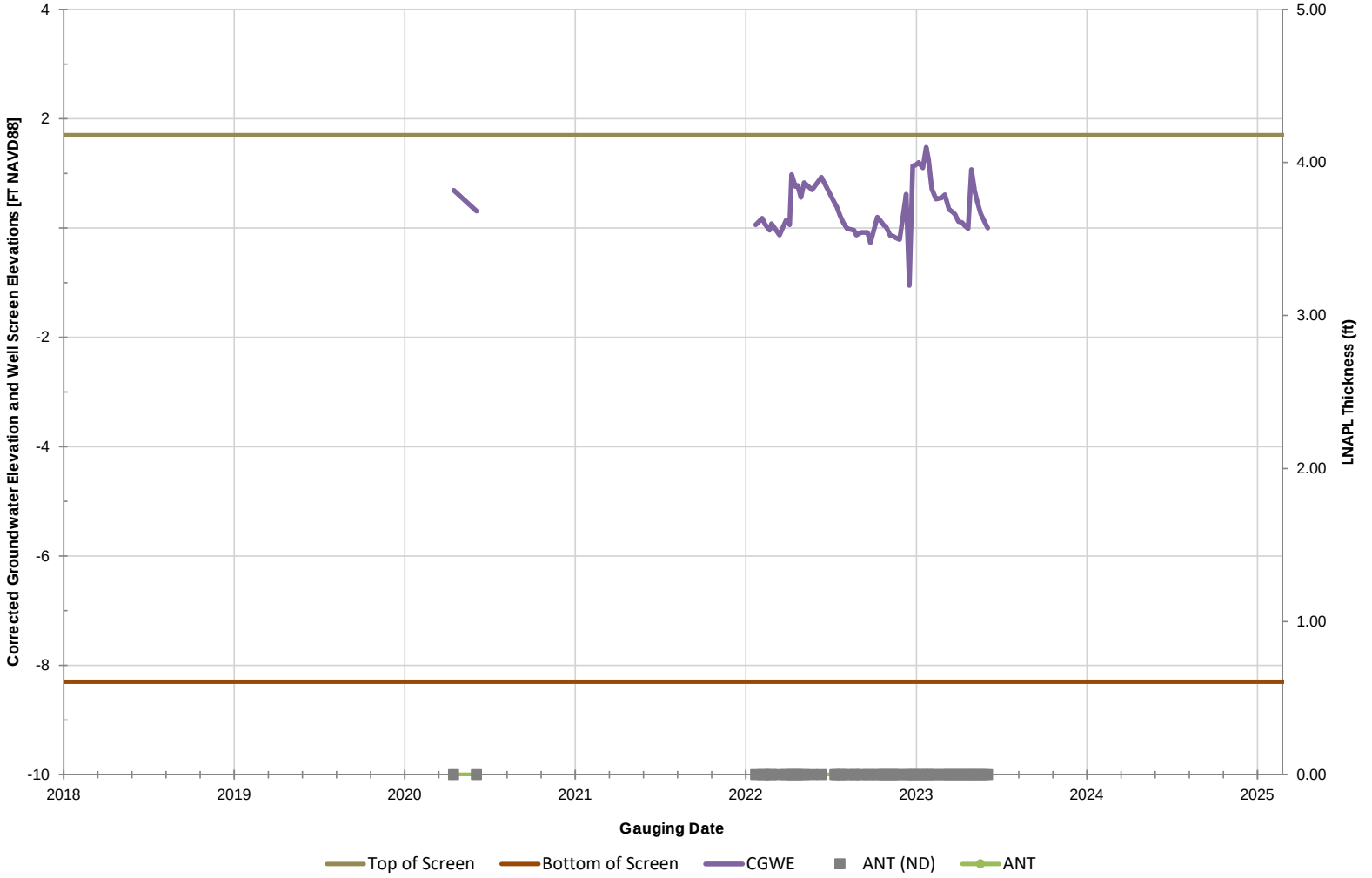
Figure/Well No.

S-435

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

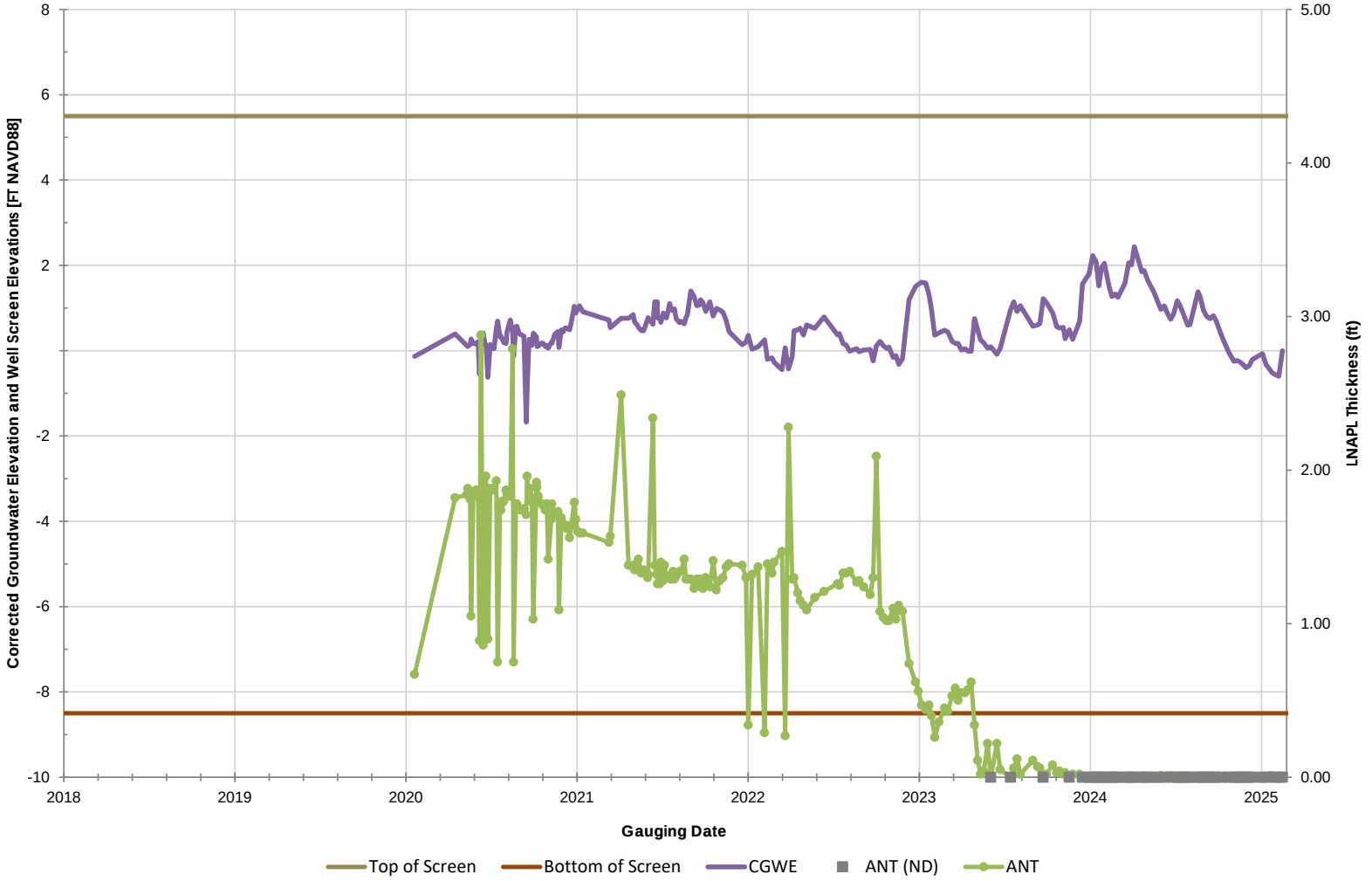
Figure/Well No.

S-436

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

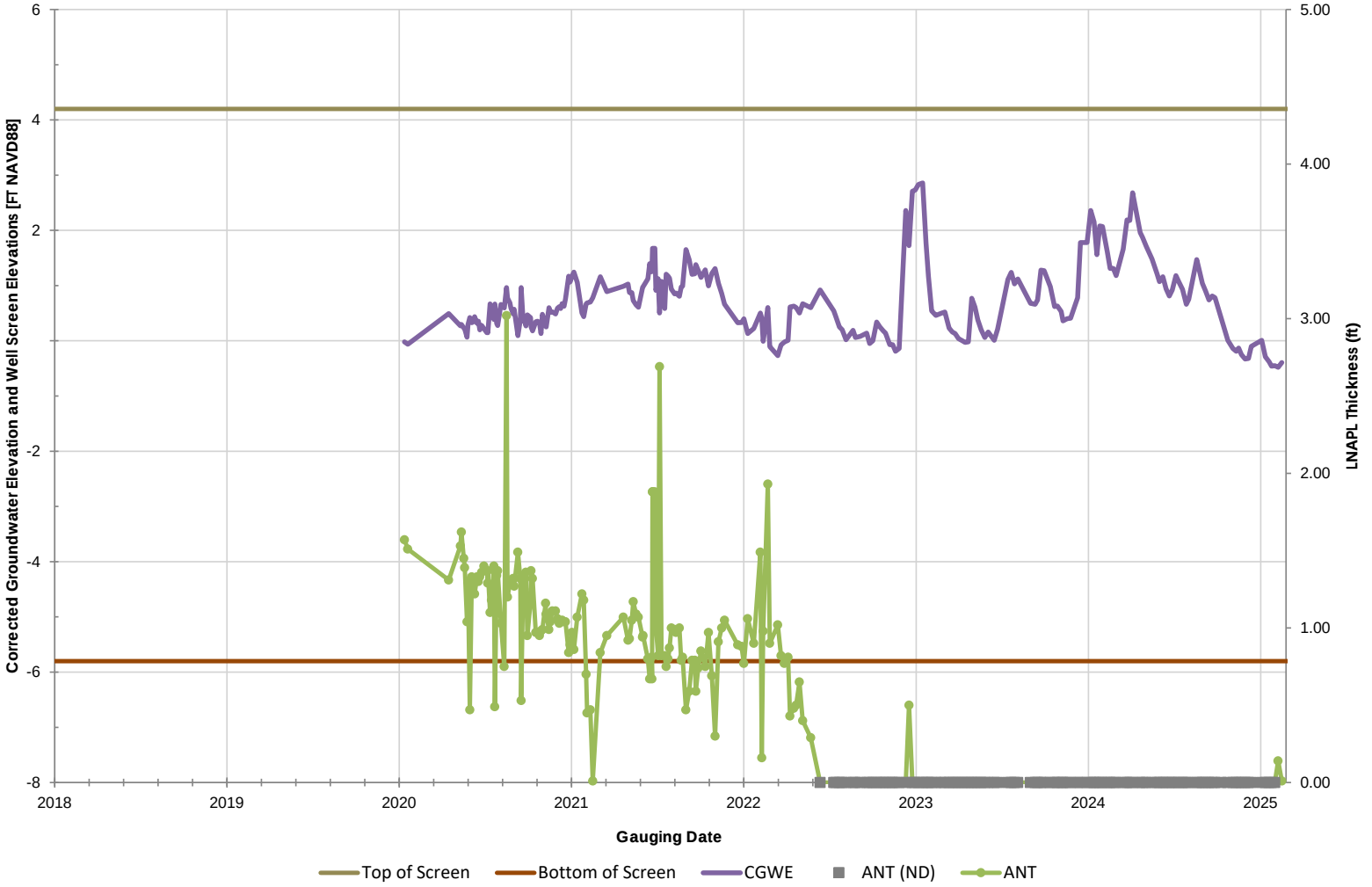
Figure/Well No.

S-437

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

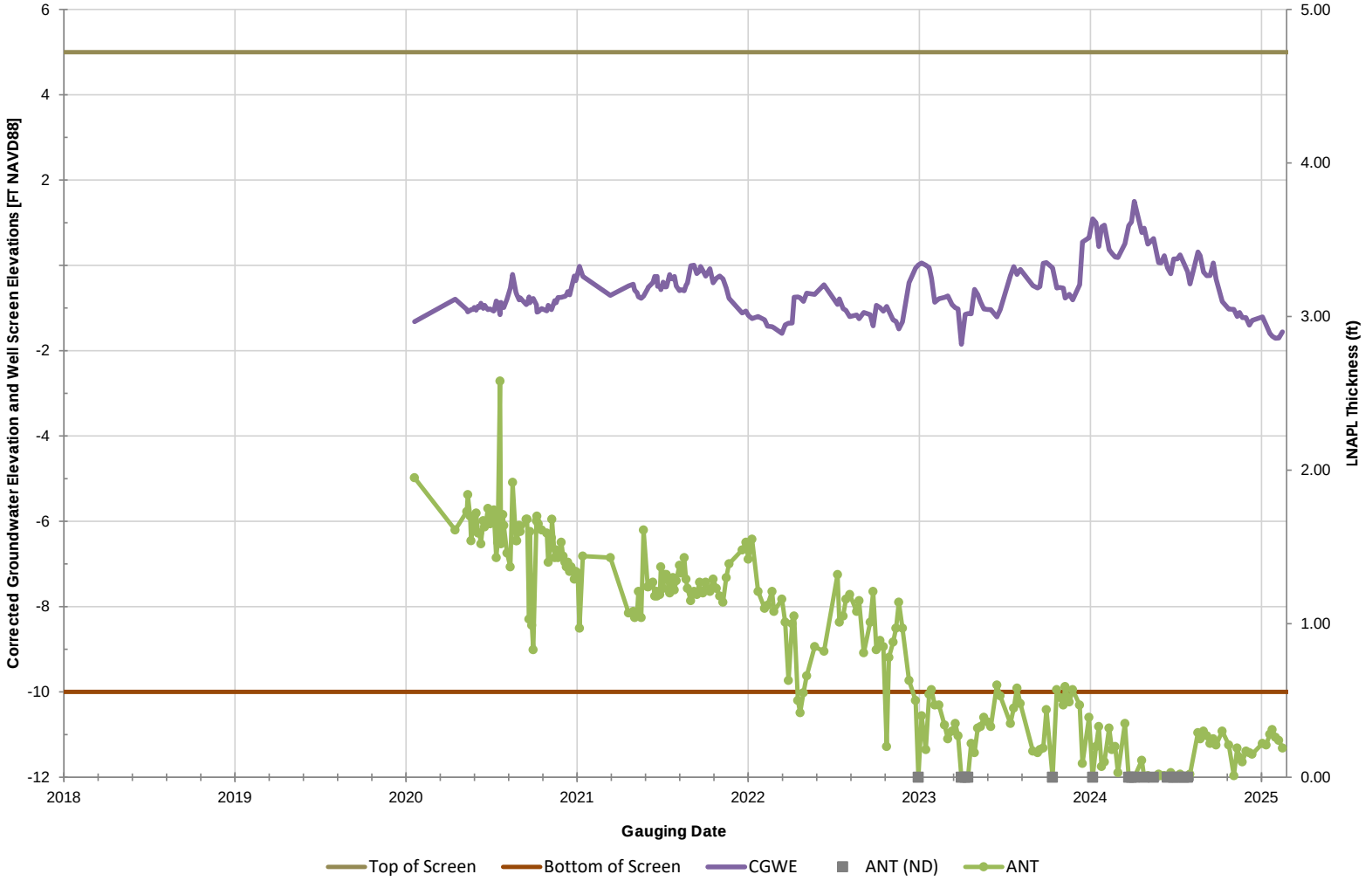
Figure/Well No.

S-438

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

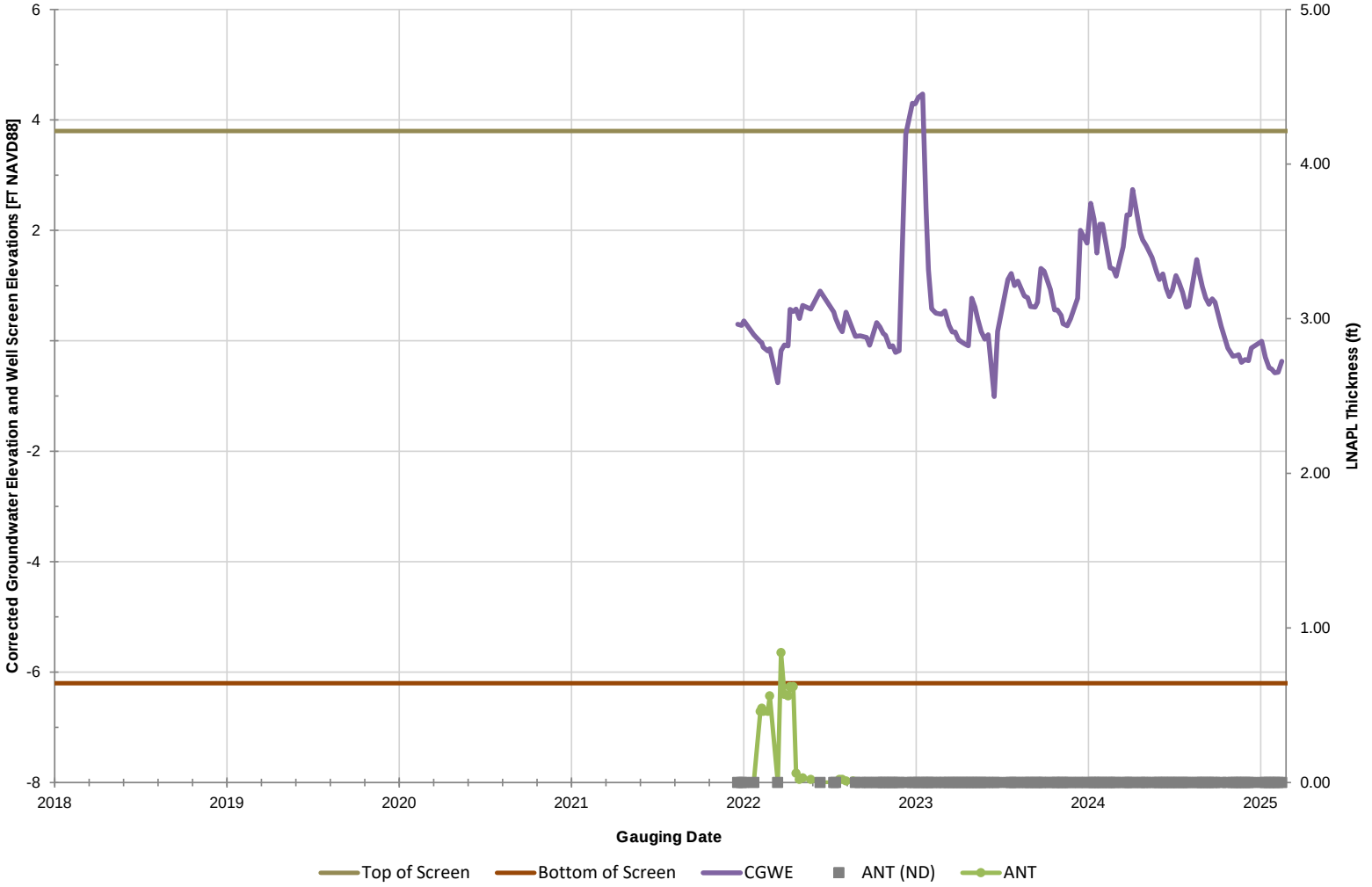
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S-439

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

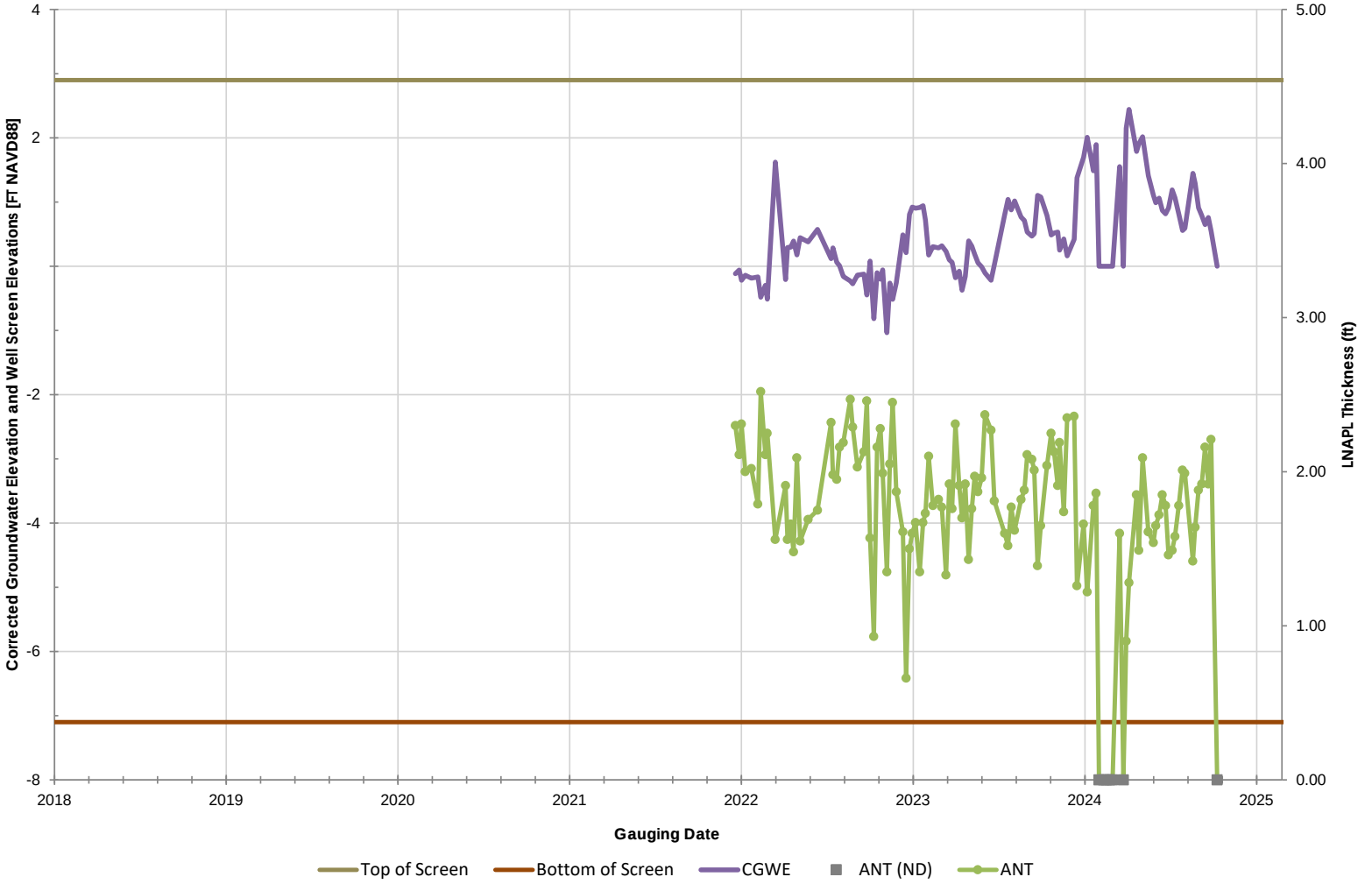
Figure/Well No.

S-479

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

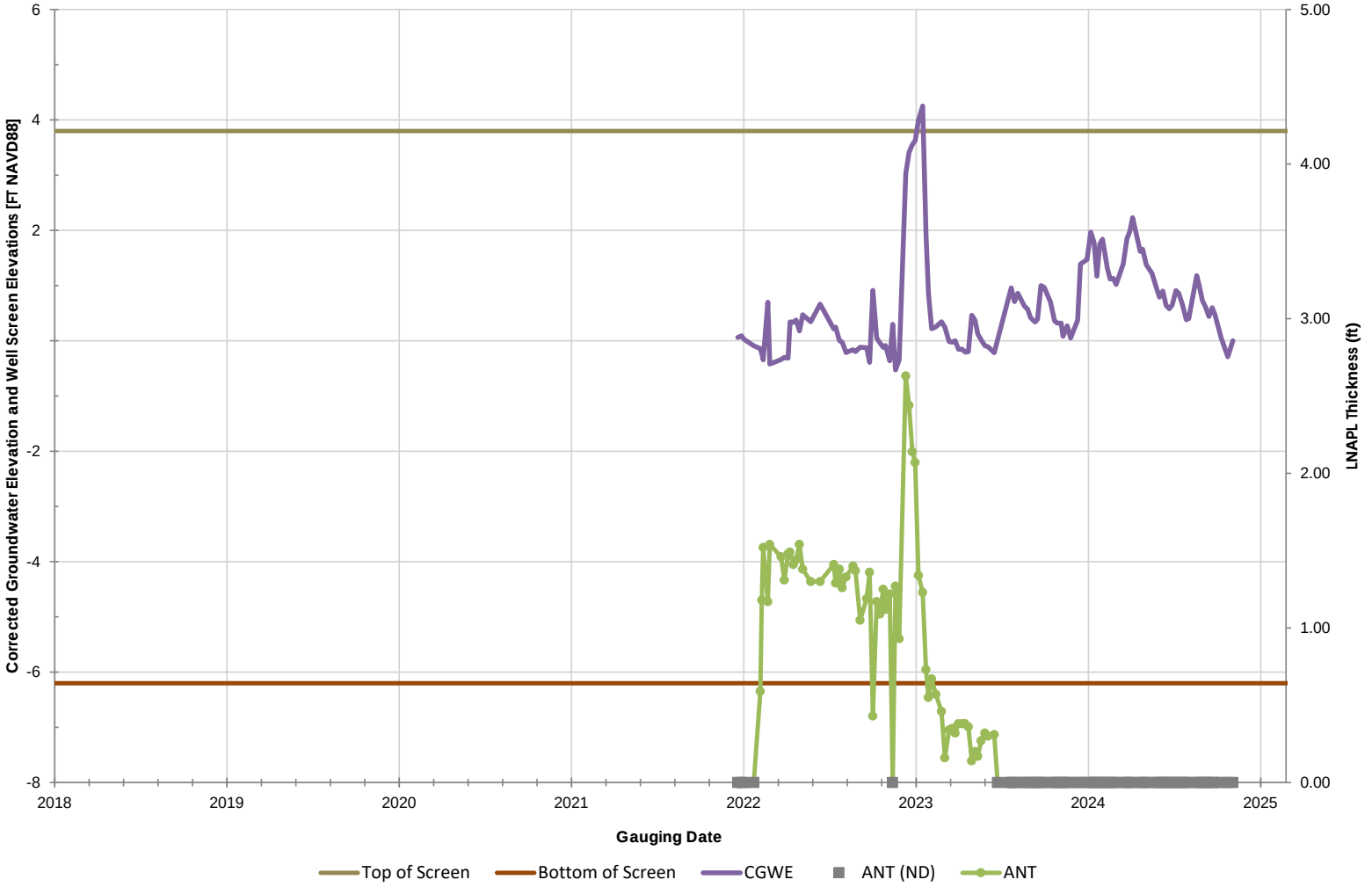
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S-480

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

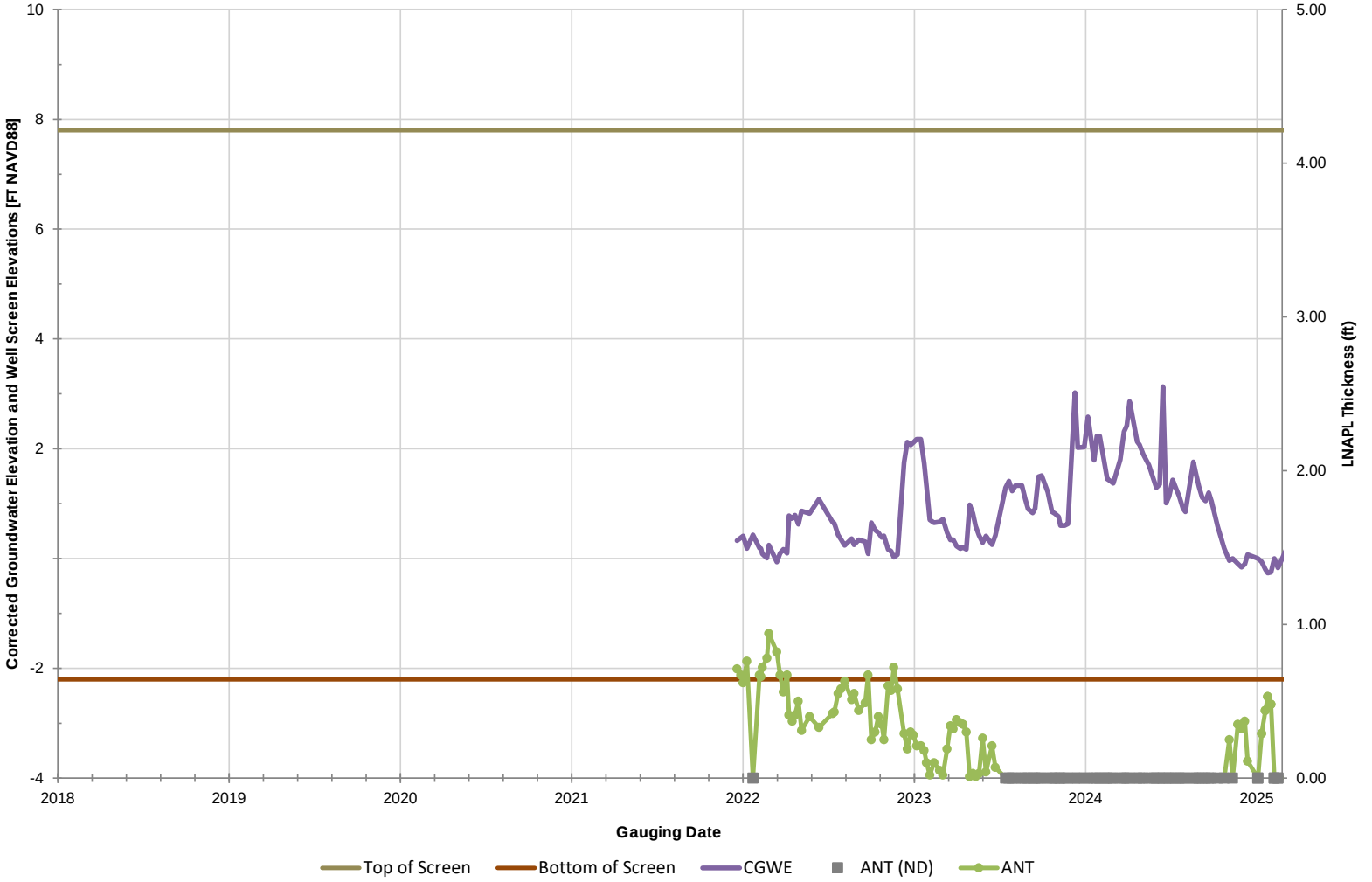
Figure/Well No.

S-481

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

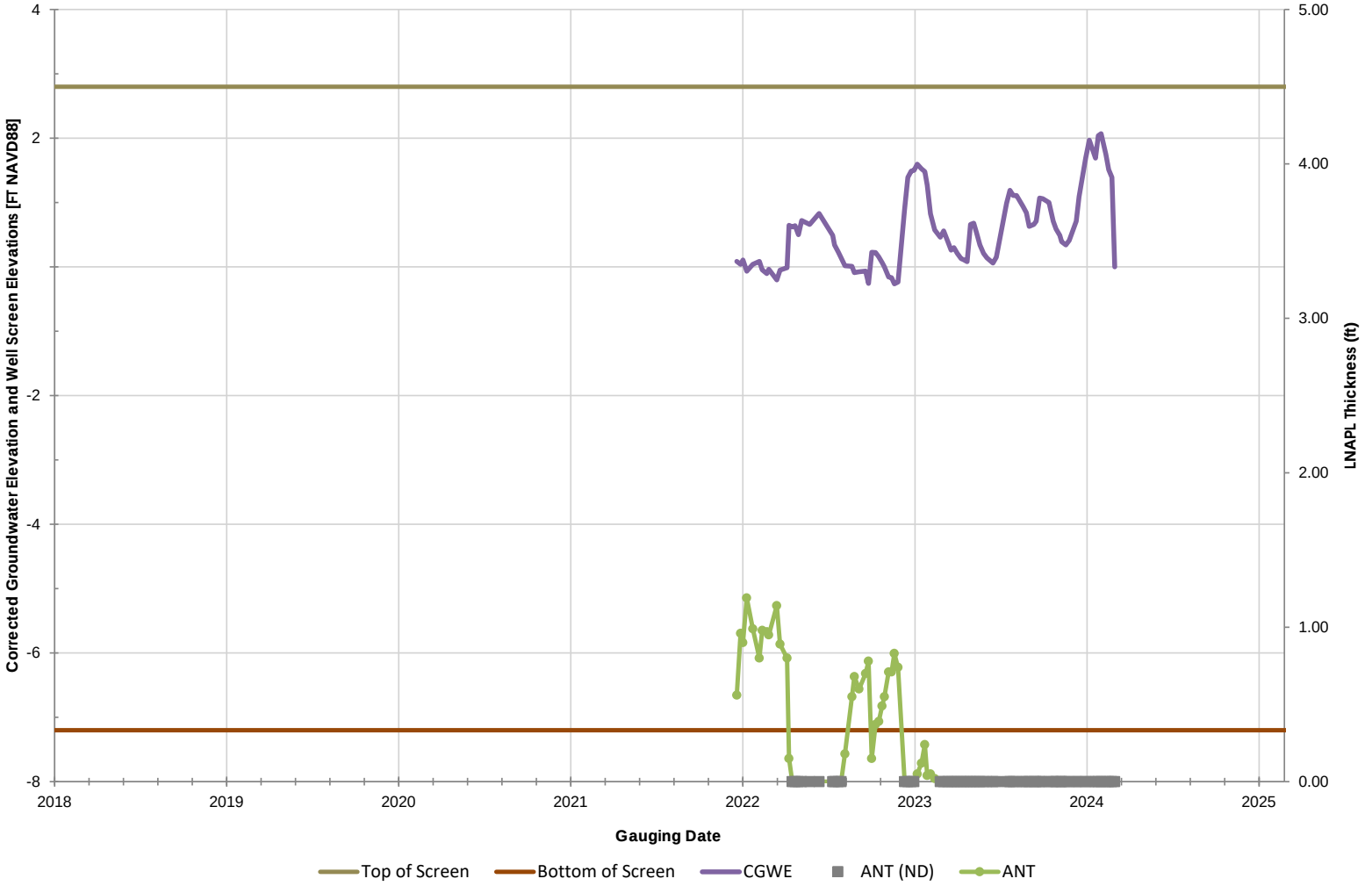
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S-482

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

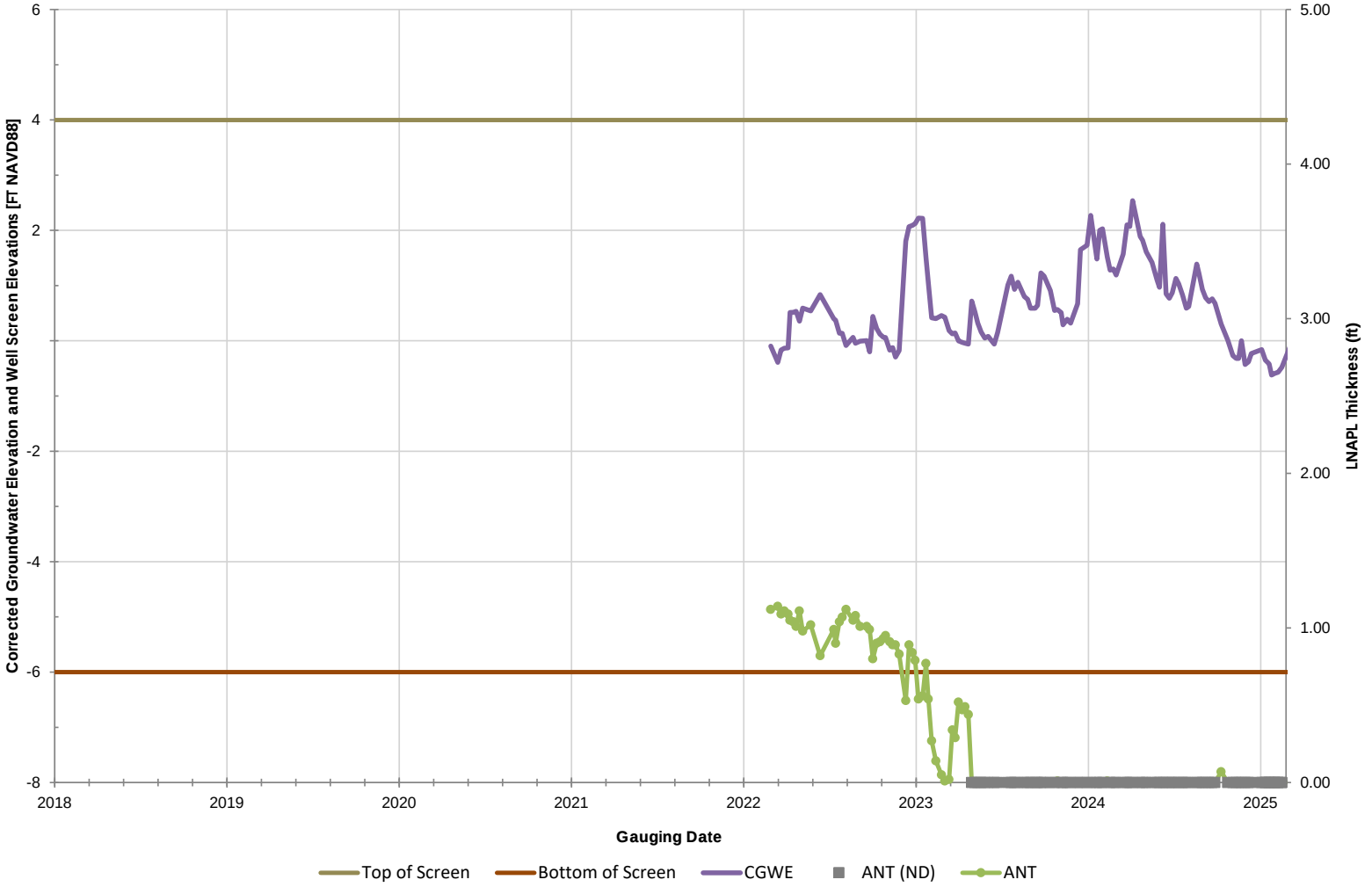
Figure/Well No.

S-483

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

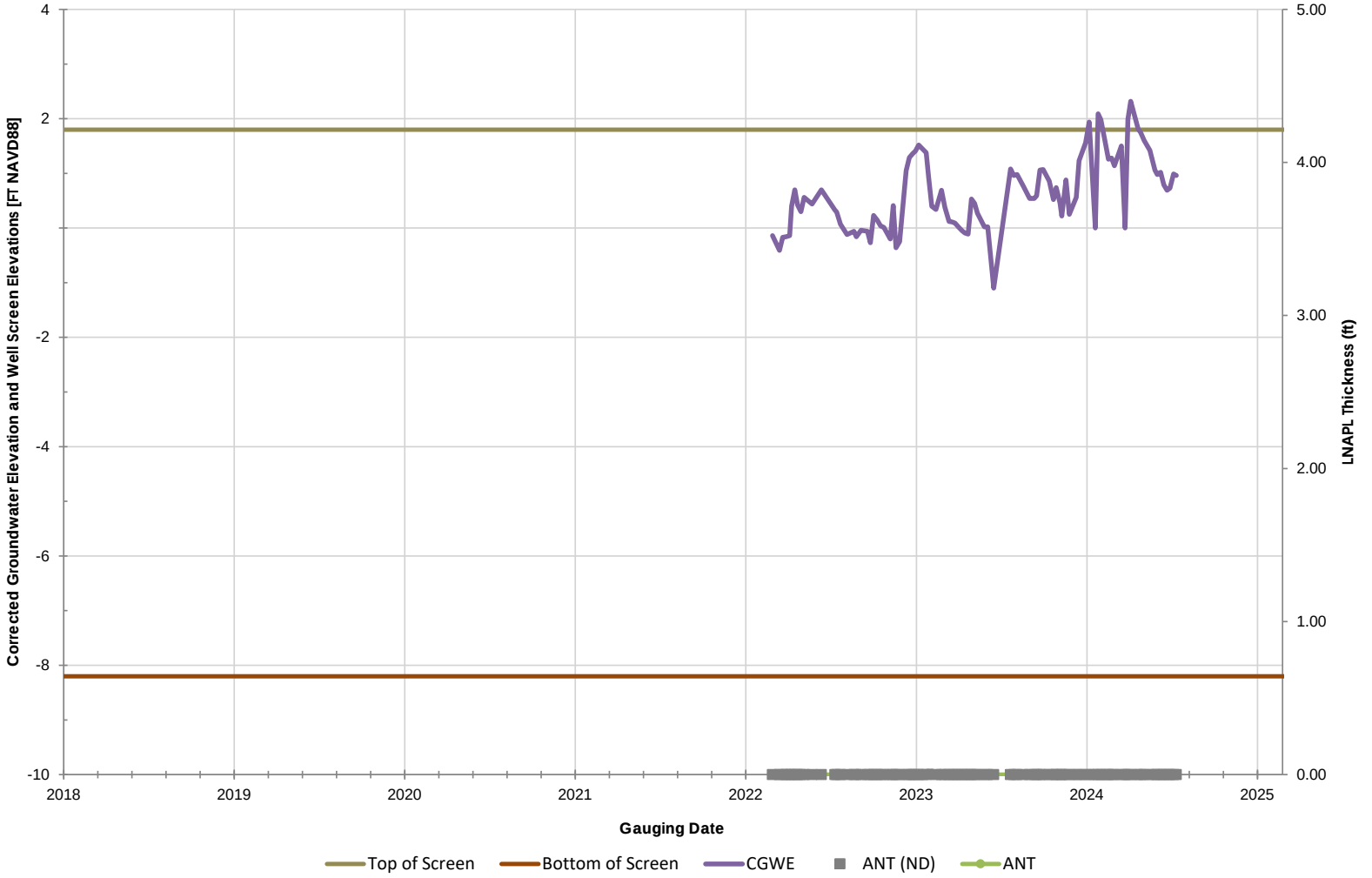
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S-484

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

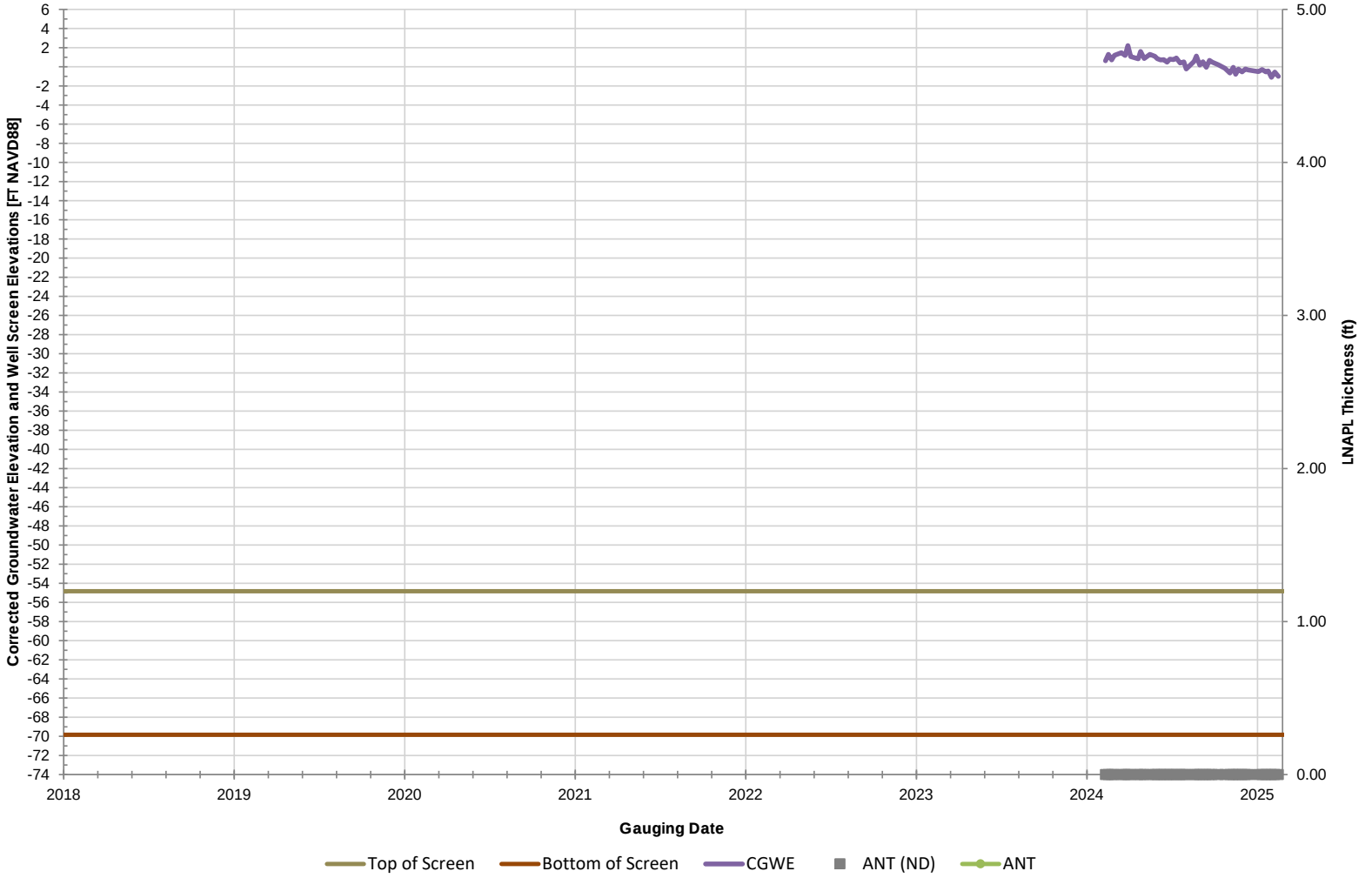
Figure/Well No.

S-485

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

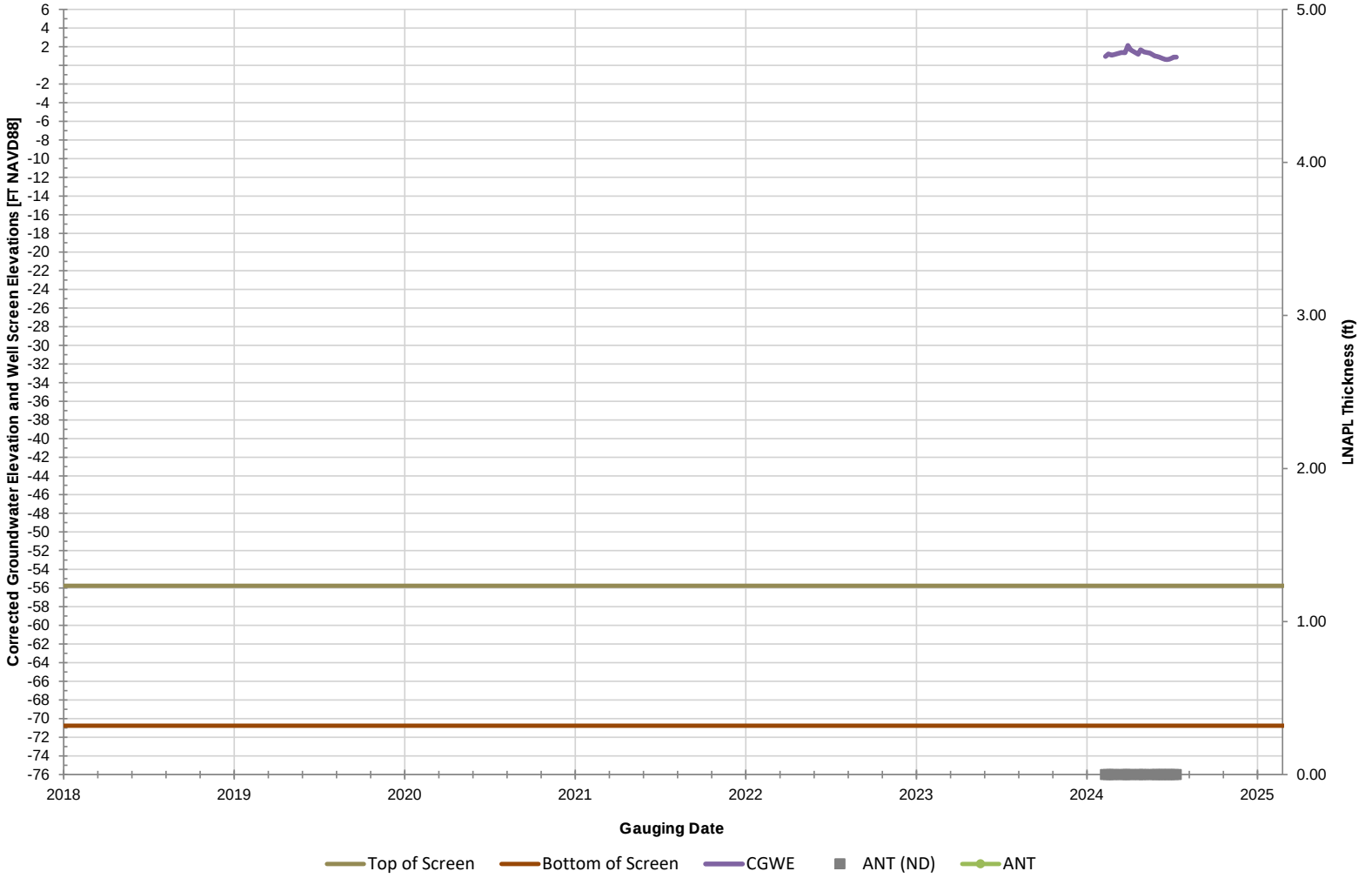
Figure/Well No.

S-508

Title

UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988



Former PES Refinery
UDEX Underground Line Release Area
3144 West Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

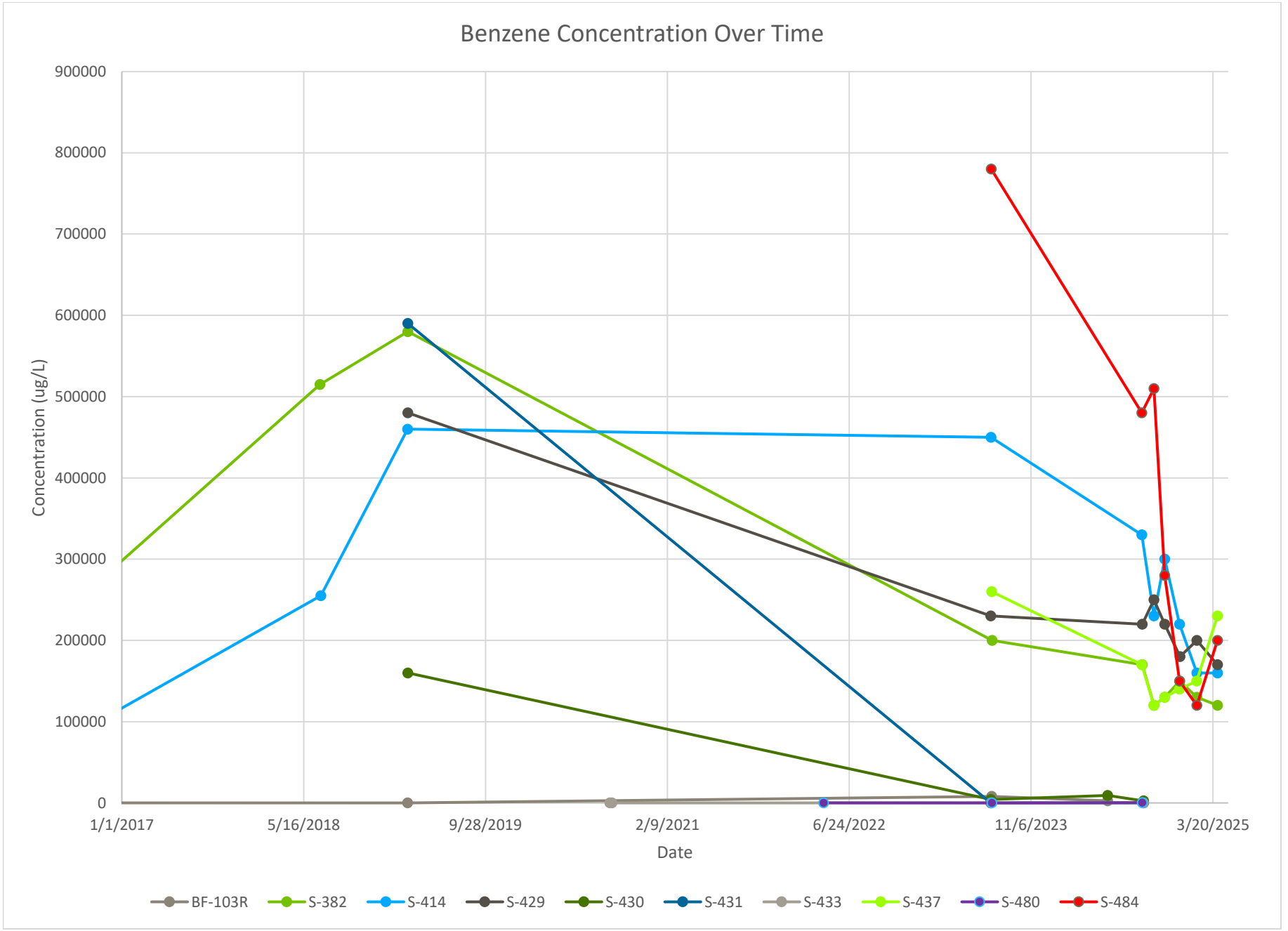
S-509

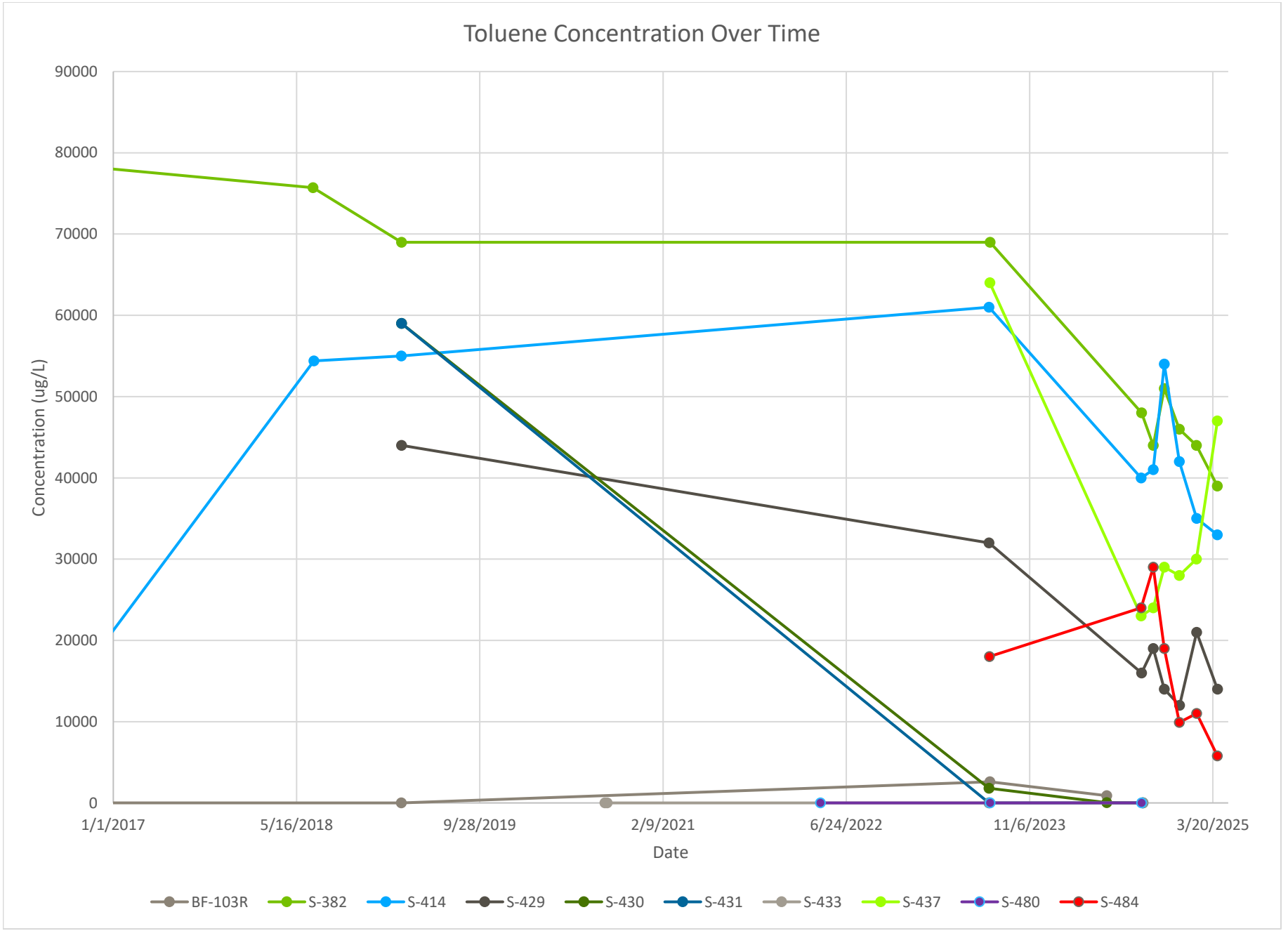
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UDEX Underground Line Release Area
Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Notes:
CGWE = corrected groundwater elevation; ANT = apparent LNAPL thickness
LNAPL = light non-aqueous phase liquid; ND = LNAPL not detected
ft = feet; NAVD88 = North American Vertical Datum of 1988

Appendix J Benzene and Toluene Trend Graphs


Benzene Concentration Over Time
900000
800000
700000
600000
500000
400000
300000
200000
100000
0
Concentration (ug/L)
1/1/2017
5/16/2018
9/28/2019
2/9/2021
6/24/2022
11/6/2023
3/20/2025
Date
BF-103R
S-382
S-414
S-429
S-430
S-431
S-433
S-437
S-480
S-484


Toluene Concentration Over Time
Concentration (ug/L)
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
1/1/2017
5/16/2018
9/28/2019
2/9/2021
6/24/2022
11/6/2023
3/20/2025
Date
BF-103R
S-382
S-414
S-429
S-430
S-431
S-433
S-437
S-480
S-484

Appendix K Ecological Assessment Documentation

1. PROJECT INFORMATION

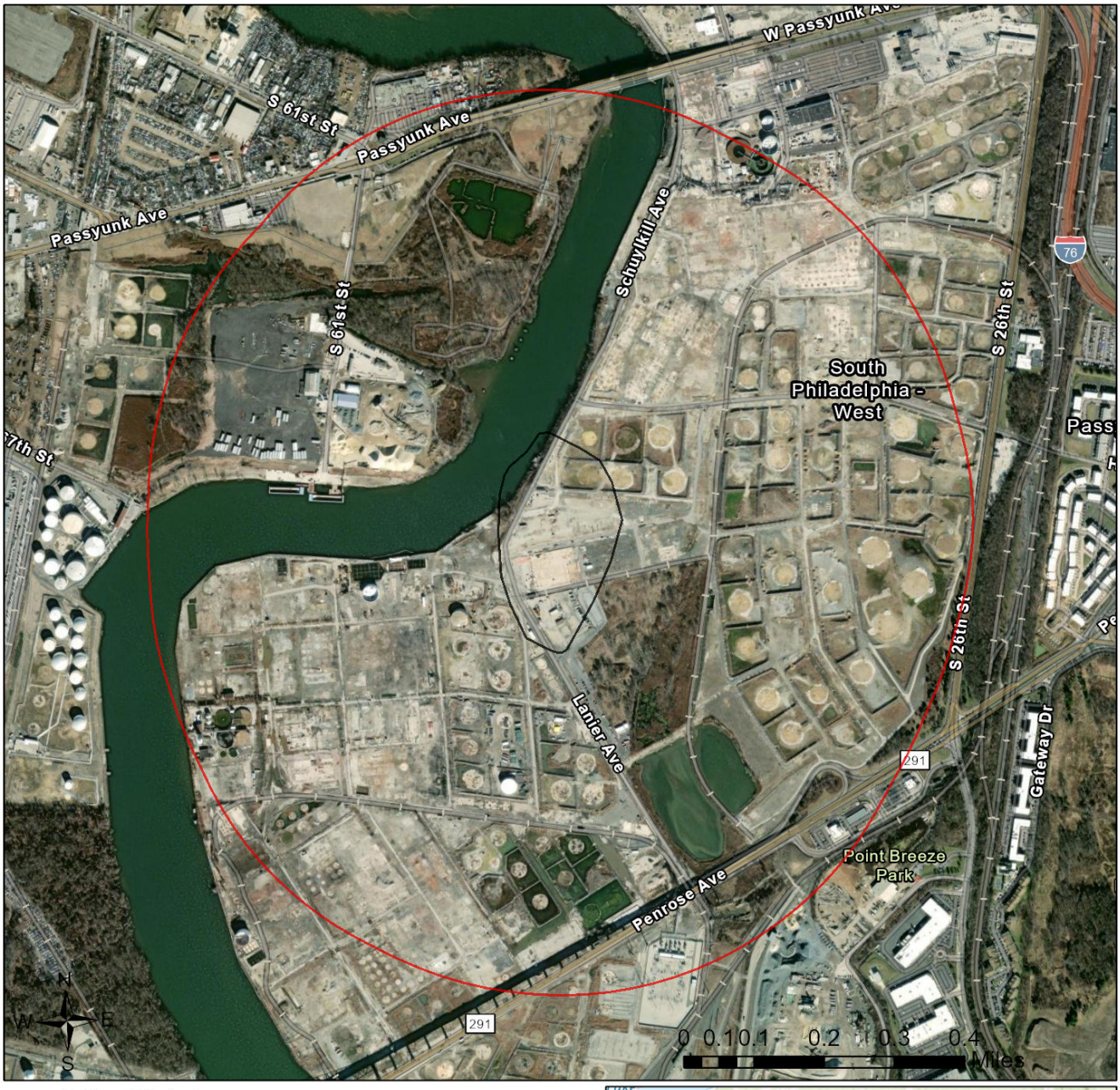
Project Name: **Former Philadelphia Refinery UDEX**
Date of Review: **6/17/2025 02:00:00 PM**
Project Category: **Hazardous Waste Clean-up, Site Remediation, and Reclamation, Spill (e.g., oil, chemical)**
Project Area: **25.92 acres**
County(s): **Philadelphia**
Township/Municipality(s): **Philadelphia City**
ZIP Code:
Quadrangle Name(s): **PHILADELPHIA**
Watersheds HUC 8: **Schuylkill**
Watersheds HUC 12: **City of Philadelphia-Schuylkill River**
Decimal Degrees: **39.910127, -75.204374**
Degrees Minutes Seconds: **39° 54' 36.4584" N, 75° 12' 15.7461" W**

2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

Former Philadelphia Refinery UDEX



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Former Philadelphia Refinery UDEX



Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
Sources: Esri, Maxar, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA,

RESPONSE TO QUESTION(S) ASKED

Q1: Aquatic habitat (stream, river, lake, pond, etc.) is located on or adjacent to the subject property and project activities (including discharge) may occur within 300 feet of these habitats?
Your answer is: Yes

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jursidictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission
RESPONSE:
No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources
RESPONSE:
No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission
RESPONSE:
Further review of this project is necessary to resolve the potential impact(s). Please send project information to this agency for review (see WHAT TO SEND).

PFBC Species: (Note: The Pennsylvania Conservation Explorer tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below.)

Scientific Name	Common Name	Current Status
Sensitive Species**		Endangered
Sensitive Species**		Endangered
Sensitive Species**		Threatened

U.S. Fish and Wildlife Service
RESPONSE:
No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq. is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

* Special Concern Species or Resource - Plant or animal species classified as rare, tentatively undetermined or candidate as well as other taxa of conservation concern, significant natural communities, special concern populations (plants or animals) and unique geologic features.
** Sensitive Species - Species identified by the jurisdictional agency as collectible, having economic value, or being susceptible to decline as a result of visitation.

WHAT TO SEND TO JURISDICTIONAL AGENCIES

If project information was requested by one or more of the agencies above, upload* or email the following information to the agency(s) (see AGENCY CONTACT INFORMATION). Instructions for uploading project materials can be found here. This option provides the applicant with the convenience of sending project materials to a single location accessible to all three state agencies (but not USFWS).
*If information was requested by USFWS, applicants must email, or mail, project information to IR1_ESPenn@fws.gov to initiate a review. USFWS will not accept uploaded project materials.

Check-list of Minimum Materials to be submitted:
____Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
____A map with the project boundary and/or a basic site plan(particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
In addition to the materials listed above, USFWS REQUIRES the following
____**SIGNED** copy of a Final Project Environmental Review Receipt

The inclusion of the following information may expedite the review process.
____Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
____Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at https://conservationexplorer.dcnr.pa.gov/content/resources.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552
Harrisburg, PA 17105-8552
Email: RA-HeritageReview@pa.gov

U.S. Fish and Wildlife Service
Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
Email: IR1_ESPenn@fws.gov
NO Faxes Please

PA Fish and Boat Commission
Division of Environmental Services
595 E. Rolling Ridge Dr., Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

PA Game Commission
Bureau of Wildlife Management
Division of Environmental Review
2001 Elmerton Avenue, Harrisburg, PA 17110-9797
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name:_____
Company/Business Name:_____
Address:_____
City, State, Zip:_____
Phone:(_____)_____Fax:(_____)_____
Email:_____

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

_____ _____
applicant/project proponent signature date

Stantec Consulting Services Inc.
1060 Andrew Drive, Suite 140
West Chester PA 19380-5602

May 5, 2025

Project/File: 195603450

PA Fish and Boat Commission
Division of Environmental Services
450 Robinson Lane
Bellefonte, PA 16823

Dear Sir/Madam,

Reference: Potential PNDI Conflict, Former PES Refinery UDEX PNDI Search ID: PNDI-839173, Philadelphia, Philadelphia County, Pennsylvania

Stantec Consulting Services Inc. (Stantec) is submitting this letter on behalf of Bellwether District Holdings for project work related to an underground petroleum release at the former Philadelphia Energy Solutions Refinery (facility) located at 3144 Passyunk Avenue, Philadelphia, Pennsylvania (**Figure 1**). Additionally, the facility is part of the Pennsylvania Land Recycling Program (Act 2). As a part of this program, Stantec is currently preparing an Ecological Risk Assessment to examine potential impacts to threatened species, endangered species, and species of special concern.

The Land Recycling Program regulations in 25 PA Code Chapter 250, specifically §250.311 and §250.402, require an evaluation of ecological receptors for the project. According to the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Tool search (PNDI Search ID: PNDI-839173), potential impacts may exist within the project area under the jurisdiction of the Pennsylvania Fish and Boat Commission (PFBC).

The search identified three undisclosed sensitive species as endangered and/or threatened within the general project area. A Species Impact Review (SIR) request form is included with this submission, which provides necessary information to conduct a database search for species of special concern listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, the Pennsylvania Fish and Boat Code, or the Wildlife Code.

The facility is in Philadelphia, Pennsylvania, and consists of industrial property with access currently restricted by fencing and security measures. The current and intended future uses of the former PES Refinery are non-residential. The facility formerly refined crude oil and produced various petroleum products. The facility was sold in 2020 to Hilco Redevelopment Partners (HRP) and is currently undergoing redevelopment including earthwork and construction of non-residential structures. This PNDI request is not in relation to the demolition and redevelopment work, but for environmental assessment related to remediation of an underground release of petroleum product in an approximately 7-acre area adjacent to the eastern bank of the Schuylkill River (**Figure 1**). The petroleum release was discovered in 2018 and continues to be remediated.

We request that PFBC provide the names of the threatened species and endangered species listed in the PNDI receipt so that Stantec can perform an Ecological Risk Assessment for those species in accordance with the Land Recycling Program. Stantec intends to examine whether there is a potential for an

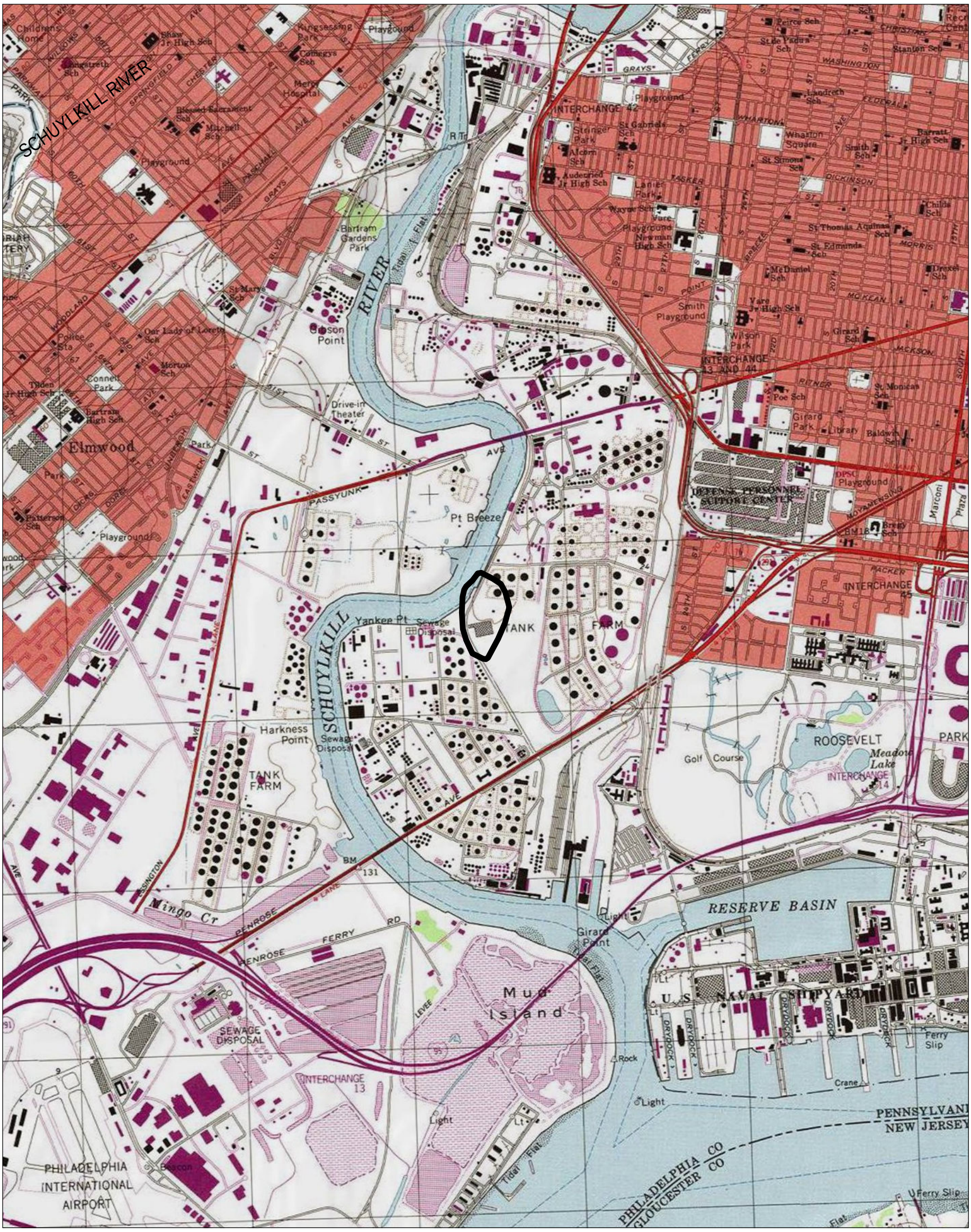
Reference: Potential PNDI Conflict, Former Philadelphia Refinery, AOIs 1-8 PNDI Search ID: PNDI-803851, Philadelphia, Philadelphia County, Pennsylvania

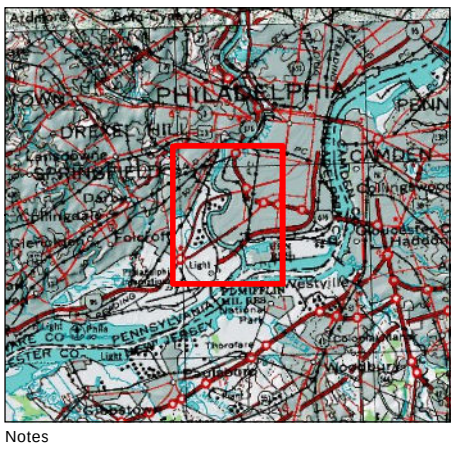
unacceptable risk to exist to these species as a result of the UDEX release. Results of the assessment will be included in documents provided to the Pennsylvania Department of Environmental Protection as a part of the Act 2 process. If you have questions on the enclosed material or require any additional information to make your determination, please feel free to contact me at (610) 850-1420.

Regards,

Andrew Klingbeil, P.G.
Associate Geologist
Phone: (610) 840-2525
Mobile: (610) 840-1420
andrew.klingbeil@stantec.com

Attachment: Figure 1: PESRM UDEX Release – General Project Area for PNDI Species Impact Review
PA Fish and Boat Commission Species Impact Review Request Form





Notes

1. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
2. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
3. Source: Stantec
4. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed © Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2015 Microsoft Corporation

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

LEGEND

APPROXIMATE BOUNDARY OF PROJECT AREA

0.25 0 0.25 0.5 Miles

1:24,000 (At Original document size of 11x17)

N

Stantec

PHILADELPHIA ENERGY SOLUTIONS

Project Location
City of Philadelphia,
Philadelphia County,
Pennsylvania

195603450
Prepared by ADK on 5/1/2025
Technical Review by JK on 5/2/2025
Independent Review by SK on 5/5/2025

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING, LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.
1

Title
PESRM UDEX RELEASE - GENERAL PROJECT AREA FOR PNDI SPECIES IMPACT REVIEW

PFBC-DES-NDS-1 (5/2/03)

COMMONWEALTH OF PENNSYLVANIA

FISH AND BOAT COMMISSION

NATURAL DIVERSITY SECTION

SPECIES IMPACT REVIEW (SIR) REQUEST FORM

A. This form provides the site information necessary to perform a computer database search for species of special concern listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, the Pennsylvania Fish and Boat Code or the Wildlife Code.

B. Use only ***one form*** for each proposed project or location. Complete the information below and **mail** form to:

Natural Diversity Section
Division of Environmental Services
PA Fish and Boat Commission
450 Robinson Lane
Bellefonte, PA 16823
Fax: (814) 359-5175

C. This form, a cover letter including a project narrative, and accompanying maps should be sent to the above address for environmental reviews that ***only*** concern ***reptiles, amphibians, fishes and aquatic invertebrates.*** Reviews for other natural resources must be submitted to other appropriate agencies.

D. The absence of recorded information from our databases and files does not necessarily imply actual conditions on site. Future field investigations could alter this determination. The information contained in our files is routinely updated. A review is valid for one year.

E. ***Please send us only one (1) copy of your request*** – either by fax or by mail – not both. Mail is preferred to improve legibility of maps. Facsimile submission will not improve our response turn-around time.

F. ***Allow 30 days for completion of the review from the date of PFBC receipt.*** Large projects and workload may extend this review timeframe.

G. ***In any future correspondence with us following your receipt of the SIR response, please refer to the assigned SIR number at the top left of our cover letter.***

H. **FORMS THAT ARE NOT COMPLETED IN FULL WILL NOT BE REVIEWED.**

PLEASE PRINT OR TYPE: If available, provide the potential conflict **PNDI Search Number:** PNDI- 839173

PFBC response should be sent to:

Company/Agency: Stantec Consulting Services Inc. Form Preparer: Andrew Klingbeil

Address: 1060 Andrew Drive, Suite 140

West Chester, PA 19380 Phone (8:00 AM to 4:00 PM): (610) 840-2561

Project Description: The project consists of approximately 7 acres. Environmental investigations are being conducted in response to an underground release of petroleum products in Pennsylvania Act 2. The program requires evaluation of ecological receptors.

Indicate if the project is: Transportation or Non-transportation x (check one)

Will the proposed project encroach directly or indirectly (e.g., runoff) upon wetlands or waterways? Circle one for each:

Wetlands: Yes (No) Unknown Waterways: (Yes) No Unknown

County: Philadelphia Township/Municipality: City of Philadelphia

Name of the United States Geological Survey (U.S.G.S.) 7.5 Minute Quadrangle Map where project is located:

Philadelphia, PA-NJ Quadrangle Project size (in acres): 7

Attach an 8.5" by 11" photocopy (**DO NOT REDUCE**) of the section of the U.S.G.S. Quadrangle Map which identifies the project location. On this map, indicate the location of the project center (if linear, depict both ends) and outline the approximate boundaries of the project area.

Specify latitude/longitude of the project center. **Latitude:** 39° ° / 54 ’/ 36.4584 ” N

Indicate latitude/longitude in degrees-minutes-seconds format only. **Longitude:** 75 ° / 12 ’/ 15.7641 ” W

Three steps are needed to convert from decimal degrees to degrees-minutes-seconds: (1) Degrees will be the whole number. (2) To get minutes, multiply the decimal degree portion by 60. (3) Multiply the decimal minute portion by 60 to get seconds.

Example: (Latitude) 40.93748 = **40°**; 0.93748 x 60 = 56.2488’= **56**’; 0.2488 x 60 = 14.928 = **15**” = **40°56’15” N**

(Longitude) 75.94740 = **75°**; 0.94740 x 60 = 56.844’ = **56**’; 0.844 x 60 = 50.64 = **51**” = **75°56’51” W**

FOR PFBC USE ONLY

SIR#	Quad Name	Data Source	Search Result-Potential Species Conflict	Action

pennsylvania
FISH AND BOAT COMMISSION

June 27, 2025

IN REPLY REFER TO
SIR# 61661

Stantec
Shravani Kalita
1060 Andrew Drive
West Chester, Pennsylvania 19380

RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species
PNDI Search No. 839173_1
Former Philadelphia Refinery UDEX
Philadelphia City: PHILADELPHIA County

Dear Shravani Kalita:

This responds to your inquiry about a Pennsylvania Natural Diversity Inventory (PNDI) Internet Database search "potential conflict" or a threatened and endangered species impact review. These projects are screened for potential conflicts with rare, candidate, threatened or endangered species under Pennsylvania Fish and Boat Commission jurisdiction (fish, reptiles, amphibians, aquatic invertebrates only) using the Pennsylvania Natural Diversity Inventory (PNDI) database and our own files. These species of special concern are listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, and the Pennsylvania Fish and Boat Code (Chapter 75), or the Wildlife Code.

Based on records maintained in the Pennsylvania Natural Diversity Inventory (PNDI) database and our own files, the following rare or protected species are known from the vicinity of the project site:

Common Name (Scientific Name, PA Status)
Atlantic Sturgeon (*Acipenser oxyrinchus*, Endangered)
Shortnose Sturgeon (*Acipenser brevirostrum*, Endangered)
Northern Red-bellied Cooter (*Pseudemys rubriventris*, Threatened)

This response represents the most up-to-date summary of the PNDI data and our files and is valid for two (2) years from the date of this letter. An absence of recorded species information does not necessarily imply species absence. Our data files and the PNDI system are continuously being updated with species occurrence information. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered, and consultation shall be re-initiated.

If you have any questions regarding this review, please contact Kathy Gipe at 814-359-5186 or c-kgipe@pa.gov and refer to the SIR # 61661. Thank you for your cooperation and attention to this important matter of species conservation and habitat protection.

Sincerely,

Christopher A. Urban, Chief
Natural Diversity Section

CAU/KDG/dn

U.S. Fish and Wildlife Service
National Wetlands Inventory

UDEX Release Area



July 3, 2025

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Appendix L AGI Passive Soil Gas Sampling Report

AMPLIFIED GEOCHEMICAL IMAGING, LLC

Laboratory Report

Site: Reformate Release Investigation

Prepared for:

Stantec Consulting
1060 Andrew Drive, Suite 140
West Chester, PA 19380
USA

Prepared on:
September 19, 2018

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Project Summary and Objective

Amplified Geochemical Imaging, LLC (AGI) provided the AGI Environmental Survey used at:

Reformate Release Investigation

The service provided by AGI included delivery of the required quantity of AGI Universal Samplers, analysis by the method described below for the requested organic compounds, reporting of the data, and contour mapping (as needed).

This report includes results for only the samples noted under the Laboratory Sample Report section. If contour maps are part of the project deliverable, the maps will be prepared and issued under a separate report cover, upon receipt of a usable sitemap (electronic) and compound choices for contouring.

Written/submitted by:

Ray Fenstermacher, P.G.
Project Manager

Reviewed/approved by:

Ian McMullen
Chemist

Analytical data approved by:

Ian McMullen
Chemist

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Quality Assurance Statement

The AGI Laboratory, at Amplified Geochemical Imaging's facility in Newark, DE USA, operates under the guidelines of its ISO Standard 17025 DoD ELAP accreditation, and its Quality Assurance Manual, Operating Procedures, and Methods (SOP-QA-0462).

For this project, the analytical method, results, and observations reported do [ ] do not [√] fall within the scope of AGI's ISO 17025 accreditation.

Screening/Concentration Method

The AGI Universal Samplers are analyzed at AGI's fixed laboratory using thermal desorption-gas chromatography/mass spectrometry (TD-GC/MS) instrumentation following modified U.S. EPA Method 8260 (SPG-WI-0292) which includes the following:

- **BFB Tuning Frequency:** A BFB tune is analyzed at the start of each analytical run and after every 30 samples.
- **Initial Calibration:** A minimum of a five point calibration curve is analyzed prior to the analysis of samples.
- **Initial Calibration Verification (ICV):** Following the calibration a second-source reference standard is analyzed to verify the accuracy of the calibration. Acceptance criteria for the ICV is +/- 30%.
- **Linearity of Target Compounds:** If the RSD of any target analyte is less than or equal to 25% then average response factor can be used for quantitation. If the RSD exceeds 25% for a target compound a regression equation can be used for quantitation.
- **Continuing Calibration Verification:** After every 10 samples, and at the end of each analytical batch, a mid-level second-source Reference Standard is analyzed. The acceptance criteria for all target analytes in the reference standards are +/- 50% of the true value.
- **Method Blank:** Analyzed prior to the analysis of field samples and every 30 samples.

Note: Analyte levels reported for the field-deployed AGI Universal Samplers that exceed trip and method blank levels, and/or the reporting limit, are more likely to have originated from on-site sources.

Media Sampled:	SOIL GAS
Chemist - sample analysis:	Jasmine Smith
Chemist - data processor:	Jasmine Smith
Chemist - data review:	Ian McMullen

Method deviations: None

Please note that data file names ending with R are rerun samples using the second pair of sorbers, in which the original results were not reported. Data file names ending in D are duplicate analysis results for the second set of sorbers from the same sampler, and are reported.

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Additional Report Information

- Comments
- Laboratory Sample Report
- Chain of Custody
- Installation and Retrieval Log
- Data Table(s) and Key
- Concentration Calculation Method Summary
- Total Ion Chromatograms

Project Specific Comments

All samplers were returned and analyzed including trip blank samples 00800437, 00800439, 00800440 and 00800441.

Survey period [1]	Samplers were installed on September 10, 2018 and retrieved on September 14, 2018 for an exposure period of four (4) days.
Tamper seal intact:	Not on all samples
Date received:	9/17/18 10:20 am By: Scott Kirlin
COC returned:	Yes
Comments:	Samples were hand-delivered to the laboratory

1 - Installation start to end of retrieval, as reported. See installation and retrieval log for individual deployment and retrieval dates and times (i.e., sampler exposure time).

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General Comments

Analytical QA/QC

Laboratory instrumentation consists of gas chromatographs equipped with mass selective detectors, coupled with automated thermal desorption units. Sample preparation involves cutting the tip off the bottom of the AGI Universal Sampler, and transferring one or more "sorbers" to a thermal desorption tube for analysis. The insertion/retrieval cord prevents soil, water and other interferences from coming in contact with the adsorbent. No further sample preparation is required. Any replicate sorbers not consumed in the initial analysis will be discarded fifteen (15) days from the date of the laboratory report.

Data are archived and stored in a secure manner as per AGI's Quality Assurance program (SOP-QA-0462).

Total petroleum hydrocarbons (TPH), gasoline-range petroleum hydrocarbons (GRPH), and/or diesel range petroleum hydrocarbons (DRPH), when reported, are calculated using the area under the peaks observed in m/z 55 and 57 selected ion chromatograms. Quantitation of the mass values was performed using the response factor for a specific alkane (present in the calibration standards). TPH values include the entire chromatogram and provide estimates for aliphatic hydrocarbon ranges of C4 to C20. GRPH and DRPH include only the relevant regions of the chromatograms and provide estimates for C4 to C10 and C10 to C20 aliphatic hydrocarbons, respectively.

Trip blanks were provided to document potential exposures that were not part of the signal of interest (e.g., impact during sampler shipment, installation and/or retrieval, and storage). The trip blanks are identically manufactured and packaged AGI Universal Samplers to those samplers deployed in the field . The trip blanks remain unopened during all phases of the project. Levels reported on the trip blanks may indicate potential impact to the samplers other than the contaminant source of interest.

Unresolved peak envelopes (UPEs) are represented as a series of compound peaks clustered together around a central gas chromatograph elution time in the total ion chromatogram. UPEs may be indicative of complex fluid mixtures. UPEs observed early in the chromatograms are considered to indicate presence of more volatile fluids, while UPEs observed later in the chromatogram may indicate the presence of less volatile fluids. Multiple UPEs may indicate the presence of multiple complex fluids.

Total ion chromatograms (TICs) are included in the Attachments. The eight-digit serial number of each sampler is incorporated in the TIC identification (e.g., 12345678.D represents AGI Universal Sampler 12345678).

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General Comments

Soil Gas Sampling

For soil gas sampling, the AGI Environmental Survey reports mass levels migrating through the open pore spaces of the soil and diffusing through the sampler membrane for sorption by the engineered, hydrophobic adsorbents, housed within the membrane tube. During the migration of the soil gas away from the source to the AGI Universal Sampler, the vapors are subject to a variety of attenuation factors. The soil gas masses reported on the samplers compare favorably with the concentrations reported in the soil or groundwater (e.g., where soil gas levels are reported at greater levels to other sampled locations on the site, the matrix data should reveal the same pattern, and vice versa). However, due to a variety of factors, a perfect comparison between matrix data and soil gas levels can rarely be achieved.

Soil gas concentrations (µg/m3) are calculated following the method described in the Additional Report Information section.

Soil gas signals reported by this method cannot be correlated specifically to soil adsorbed, groundwater, and /or free-phase contamination. The soil gas signal reported from each AGI Universal Sampler can evolve from all of these sources. Differentiation between soil and groundwater contamination can only be achieved with prior knowledge of the site history (i.e., the site is known to have groundwater contamination only).

Air Sampling

For indoor, outdoor, and crawlspace air sampling, the AGI Environmental Survey reports mass levels present in the air and diffusing through the sampler membrane for sorption by the engineered adsorbents housed within the membrane tube.

Air concentrations (µg/m3) are calculated following the method described in the Additional Report Information section.

Groundwater and Sediment Porewater Sampling

For groundwater and sediment porewater sampling, the AGI Environmental Survey reports the mass levels of compounds present in the water which, when coming in contact with the sampler membrane, partitions out of solution, and diffuses through the sampler membrane for sorption by the engineered adsorbents.

Water concentrations (µg/L) are calculated using the quantified mass, exposure period and the compound specific uptake rate. The rates were measured under controlled experimental conditions. The uptake rates are corrected for water pressure (depth of the AGI Universal Sampler below the water table), water temperature and the aquifer flow rate. For sediment porewater, the uptake rate is corrected for the reduced volume of water in the sediment, by multiplying the uptake rate by the pore water fraction.

Laboratory Sample Report

AGI Sample ID	Field ID	Sample Type
00799439	1	FIELD SAMPLE
00799440	2	FIELD SAMPLE
00799441	3	FIELD SAMPLE
00799442	4	FIELD SAMPLE
00799443	5	FIELD SAMPLE
00799444	6	FIELD SAMPLE
00799445	7	FIELD SAMPLE
00799446	8	FIELD SAMPLE
00799447	9	FIELD SAMPLE
00799448	28	FIELD SAMPLE
00799449	21	FIELD SAMPLE
00799450	14	FIELD SAMPLE
00799451	13	FIELD SAMPLE
00799452	20	FIELD SAMPLE
00799453	19	FIELD SAMPLE
00799454	18	FIELD SAMPLE
00799455	17	FIELD SAMPLE
00799456	16	FIELD SAMPLE
00799457	10	FIELD SAMPLE
00799458	11	FIELD SAMPLE
00799459	12	FIELD SAMPLE
00799460	15	FIELD SAMPLE
00799461	23	FIELD SAMPLE
00799462	24	FIELD SAMPLE
00799463	25	FIELD SAMPLE
00799464	26	FIELD SAMPLE
00799465	27	FIELD SAMPLE
00799466	34	FIELD SAMPLE
00799467	40	FIELD SAMPLE
00799468	33	FIELD SAMPLE
00799469	32	FIELD SAMPLE
00799470	31	FIELD SAMPLE
00799471	30	FIELD SAMPLE
00799472	37	FIELD SAMPLE
00799473	38	FIELD SAMPLE
00799474	22	FIELD SAMPLE
00800425	29	FIELD SAMPLE
00800426	36	FIELD SAMPLE
00800427	46	FIELD SAMPLE
00800428	39	FIELD SAMPLE
00800429	43	FIELD SAMPLE
00800430	44	FIELD SAMPLE
00800431	45	FIELD SAMPLE
00800432	41	FIELD SAMPLE
00800433	35	FIELD SAMPLE
00800434	48	FIELD SAMPLE
00800435	47	FIELD SAMPLE
00800436	42	FIELD SAMPLE
00800437	trip blank 1	TRIP BLANK
00800439	trip blank 2	TRIP BLANK
00800440	trip blank 3	TRIP BLANK
00800441	trip blank 4	TRIP BLANK

Total # Field Samples: 48
Total # Trip Blanks: 4
Total # Unused: 0

AMPLIFIED GEOCHEMICAL IMAGING LLC

210 Executive Drive
Newark, Delaware 19702 USA
ph: +1-302-266-2428
www.agisurveys.net

AGI Universal Passive Sampler Chain of Custody
Soil gas and/or Air Sampling

Production Order #: 02038

Customer Name: Stantec Consulting

Address: 1060 Andrew Drive Suite 140
West Chester P.A. 19380
USA

Site Name: Reformate Release Investigation

Site Address:

Project Manager: Andrew Klingbeil

Serial # of Samplers Shipped			# of Samplers for Installation	48	# of Trip Blanks	4
00799439	-	00799474	Total Samplers Shipped	52	Pieces	
00800425	-	00800437	Total Samplers Received	52	Pieces	
00800439	-	00800441	Total Samplers Installed	48	Pieces	

Insertion Rods

Tips Shipped: 1

Rod Bodies Shipped 4 Kit

Serial # of Trip Blanks (Client Decides)

800437
800439
800440
800441

Prepared By: Marlene Lillowdy

Verified By:

Installation Method: (Circle those that apply)
Slide Hammer Hammer Drill (Auger)
Other

Installation Performed By:
Name: Andrew Klingbeil
Company: Stantec

Retrieval Performed By:
Name: Dane Hopkins
Company: Stantec

Installation Start Date / Time: 9/10/18
Installation Complete Date / Time: 9/10/18

Retrieval Start Date / Time: 9/14/18
Retrieval Complete Date / Time: 9/15/18

Total Samplers Retrieved: ~~48~~ 52
Total Samplers Lost In Field: 0
Total Unused Samplers Returned: 0

Insertion Rod Sections Returned: 4 plus 1 tip

Relinquished By: Marlene Lillowdy — Date/Time 8/29/18 3:40 PM
Company: AGI

Received By: — Date/Time 8/30/18
Company: Stantec

Relinquished By: — Date/Time 9/17/18
Company: Stantec 0955

Received By: — Date/Time 10:20 AM 9/17/18
Company: AGI

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210 Executive Drive, Suite 1
Newark, DE USA 19702-3335
ph: 302-266-2428

AGI Project No. 02038
Site Name: Reformate Release Inve
Site Location: Philadelphia, PA

AGI Soil Gas Sampling
Installation & Retrieval Log

Company Name: Stantec Consultin
Location: West Chester, PA
Samples collected by: Klingbeil/Ho

*** Optional or as needed**

SAMPLER SERIAL NO.	FIELD ID* (e.g., arbitrary, US EPA)	SAMPLE TYPE (Field Sample, Trip Blank, Field Blank, etc.)	INSTALLATION DATE & TIME MM/DD/YYYY HH:MM (24 Hour) ex. 12/27/2000 13:00	RETRIEVAL DATE & TIME MM/DD/YYYY HH:MM (24 Hour) ex. 12/30/2000 13:00
00799439	1	FIELD_SAMPLE	9/10/18 10:00	9/14/18 8:27
00799440	2	FIELD_SAMPLE	9/10/18 10:30	9/14/18 8:29
00799441	3	FIELD_SAMPLE	9/10/18 10:45	9/14/18 8:32
00799442	4	FIELD_SAMPLE	9/10/18 11:00	9/14/18 8:42
00799443	5	FIELD_SAMPLE	9/10/18 11:10	9/14/18 8:44
00799444	6	FIELD_SAMPLE	9/10/18 11:30	9/14/18 8:51
00799445	7	FIELD_SAMPLE	9/10/18 11:50	9/14/18 8:55
00799446	8	FIELD_SAMPLE	9/10/18 12:10	9/14/18 8:57
00799447	9	FIELD_SAMPLE	9/10/18 12:20	9/14/18 8:59
00799448	28	FIELD_SAMPLE	9/10/18 12:40	9/14/18 9:05
00799449	21	FIELD_SAMPLE	9/10/18 12:55	9/14/18 9:07
00799450	14	FIELD_SAMPLE	9/10/18 13:00	9/14/18 9:09
00799451	13	FIELD_SAMPLE	9/10/18 13:20	9/14/18 9:11
00799452	20	FIELD_SAMPLE	9/10/18 13:40	9/14/18 9:16
00799453	19	FIELD_SAMPLE	9/10/18 13:55	9/14/18 9:18
00799454	18	FIELD_SAMPLE	9/10/18 14:05	9/14/18 9:21
00799455	17	FIELD_SAMPLE	9/10/18 14:15	9/14/18 9:23
00799456	16	FIELD_SAMPLE	9/10/18 14:30	9/14/18 9:25
00799457	10	FIELD_SAMPLE	9/10/18 14:45	9/14/18 9:31
00799458	11	FIELD_SAMPLE	9/10/18 14:55	9/14/18 9:36
00799459	12	FIELD_SAMPLE	9/10/18 15:05	9/14/18 9:38
00799460	15	FIELD_SAMPLE	9/10/18 15:20	9/14/18 9:41
00799461	23	FIELD_SAMPLE	9/10/18 15:30	9/14/18 9:44
00799462	24	FIELD_SAMPLE	9/10/18 15:40	9/14/18 9:46
00799463	25	FIELD_SAMPLE	9/10/18 15:50	9/14/18 9:48
00799464	26	FIELD_SAMPLE	9/10/18 16:00	9/14/18 9:50
00799465	27	FIELD_SAMPLE	9/10/18 16:05	9/14/18 9:52
00799466	34	FIELD_SAMPLE	9/10/18 16:10	9/14/18 9:54
00799467	40	FIELD_SAMPLE	9/10/18 16:20	9/14/18 9:56
00799468	33	FIELD_SAMPLE	9/10/18 16:25	9/14/18 9:58
00799469	32	FIELD_SAMPLE	9/10/18 16:30	9/14/18 10:00
00799470	31	FIELD_SAMPLE	9/10/18 16:35	9/14/18 10:02
00799471	30	FIELD_SAMPLE	9/10/18 16:40	9/14/18 10:04
00799472	37	FIELD_SAMPLE	9/10/18 16:45	9/14/18 10:06
00799473	38	FIELD_SAMPLE	9/10/18 16:50	9/14/18 10:08
00799474	22	FIELD_SAMPLE	9/10/18 17:00	9/14/18 10:10
00800425	29	FIELD_SAMPLE	9/10/18 17:05	9/14/18 10:12
00800426	36	FIELD_SAMPLE	9/10/18 17:10	9/14/18 10:14
00800427	46	FIELD_SAMPLE	9/10/18 17:20	9/14/18 10:16
00800428	39	FIELD_SAMPLE	9/10/18 17:30	9/14/18 10:18
00800429	43	FIELD_SAMPLE	9/10/18 17:35	9/14/18 10:20
00800430	44	FIELD_SAMPLE	9/10/18 17:40	9/14/18 10:22
00800431	45	FIELD_SAMPLE	9/10/18 17:45	9/14/18 10:24
00800432	41	FIELD_SAMPLE	9/10/18 17:50	9/14/18 10:26
00800433	35	FIELD_SAMPLE	9/10/18 18:00	9/14/18 10:28
00800434	48	FIELD_SAMPLE	9/10/18 18:10	9/14/18 10:30
00800435	47	FIELD_SAMPLE	9/10/18 18:15	9/14/18 10:32
00800436	42	FIELD_SAMPLE	9/10/18 18:20	9/14/18 10:34
00800437	trip blank 1	TRIP_BLANK	9/10/18 18:30	9/14/18 10:45
00800439	trip blank 2	TRIP_BLANK	9/10/18 18:30	9/14/18 10:45
00800440	trip blank 3	TRIP_BLANK	9/10/18 18:30	9/14/18 10:45
00800441	trip blank 4	TRIP_BLANK	9/10/18 18:30	9/14/18 10:45

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AGI Soil Gas Sampling g
Installation & Retrieval Log

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*** Optional or as needed**

SAMPLER SERIAL NO.	Sampler Depth (feet bgs)	SAMPLE ENVIRONMENT* (e.g., grass, bare soil, through slab)	YES / NO		
			EVIDENCE OF LIQUID PETROLEUM HYDROCARBONS?	ODOR ?	WATER IN INSTALLATION HOLE?
00799439	1.2	crushed stone			No
00799440	1.4	crushed stone			no
00799441	1.25	crushed stone			no
00799442	1.25	asphalt			wet
00799443	1	asphalt	YES		yes
00799444	1.2	asphalt			no
00799445	1.3	asphalt			no
00799446	1.2	asphalt			yes
00799447	1.2	asphalt			yes
00799448	1.2	asphalt			yes
00799449	1	crushed stone			wet
00799450	1.25	crushed stone			wet
00799451	0.9	asphalt			yes
00799452	1.1	asphalt			wet
00799453	1.2	asphalt			wet
00799454	1.1	asphalt			wet
00799455	1	asphalt (heating oil UST excavation pea gravel)		*strong*	no
00799456	1.1	asphalt			no
00799457	1	crushed stone			no
00799458	1	asphalt			no
00799459	1.1	asphalt			wet
00799460	1	crushed stone			no
00799461	0.8	crushed stone			no
00799462	0.8	crushed stone			no
00799463	1.1	crushed stone			no
00799464	1	crushed stone			no
00799465	1.2	crushed stone			no
00799466	1	crushed stone			no
00799467	1	crushed stone			no
00799468	1	crushed stone			no
00799469	1	crushed stone			no
00799470	0.8	crushed stone			no
00799471	0.8	crushed stone			no
00799472	0.9	crushed stone			no
00799473	0.9	crushed stone			no
00799474	1	crushed stone, cinders			wet
00800425	1	crushed stone, cinders			no
00800426	1	crushed stone, cinders			no
00800427	1	crushed stone, cinders			no
00800428	1	crushed stone, cinders			no
00800429	1	crushed stone, cinders			no
00800430	1	crushed stone, cinders			no
00800431	1	crushed stone, cinders			no
00800432	1	crushed stone, cinders			no
00800433	1	crushed stone, cinders			no
00800434	1	crushed stone, cinders			no
00800435	1	crushed stone, cinders			no
00800436	1	crushed stone, cinders			no
00800437					
00800439					
00800440					
00800441					

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AGI Soil Gas Sampling
Installation & Retrieval Log

*** Optional or as needed**

	AT MINIMUM PROVIDE SOIL TYPE			
SAMPLER SERIAL NO.	**SOIL TYPE AT MODULE DEPTH (clay, loamy sand etc.)**	**TOTAL SOIL POROSITY AT MODULE DEPTH* (total volume of pores/total volume)**	**WATER FILLED SOIL POROSITY AT MODULE DEPTH* (volume of water/volume of pores)**	**PROJECTED COORDINATES X (EASTING)**
00799439	SANDY_CLAY_LOAM			2682268.941
00799440	SANDY_CLAY_LOAM			2682205.298
00799441	SANDY_CLAY_LOAM			2682149.939
00799442	SANDY_LOAM			2682264.029
00799443	SAND			2682331.396
00799444	SANDY_CLAY_LOAM			2682436.31
00799445	SANDY_CLAY_LOAM			2682541.466
00799446	SANDY_CLAY_LOAM			2682655.467
00799447	SANDY_CLAY_LOAM			2682733.132
00799448	SAND			2682739.773
00799449	SANDY_LOAM			2682767.856
00799450	SANDY_LOAM			2682823.467
00799451	SAND			2682731.396
00799452	SANDY_CLAY_LOAM			2682636.744
00799453	SANDY_CLAY_LOAM			2682555.714
00799454	SANDY_CLAY_LOAM			2682419.294
00799455	SAND			2682328.227
00799456	SANDY_LOAM			2682228.141
00799457	SANDY_LOAM			2682131.396
00799458	SANDY_CLAY_LOAM			2682231.396
00799459	SAND			2682330.528
00799460	SAND			2682131.396
00799461	SAND			2682231.917
00799462	SAND			2682331.396
00799463	SANDY_CLAY_LOAM			2682431.396
00799464	SANDY_CLAY_LOAM			2682531.396
00799465	SANDY_CLAY_LOAM			2682626.188
00799466	SANDY_CLAY_LOAM			2682631.396
00799467	SANDY_CLAY_LOAM			2682623.063
00799468	SANDY_CLAY_LOAM			2682529.573
00799469	SANDY_CLAY_LOAM			2682430.745
00799470	SANDY_CLAY_LOAM			2682320.004
00799471	SANDY_CLAY_LOAM			2682238.167
00799472	SANDY_CLAY_LOAM			2682323.063
00799473	SANDY_CLAY_LOAM			2682424.117
00799474	SANDY_LOAM			2682122.072
00800425	SANDY_LOAM			2682147.712
00800426	SANDY_LOAM			2682217.41
00800427	SANDY_LOAM			2682305.7
00800428	SANDY_LOAM			2682532.561
00800429	SANDY_LOAM			2682508.087
00800430	SANDY_LOAM			2682637.646
00800431	SANDY_LOAM			2682711.083
00800432	SANDY_LOAM			2682750.762
00800433	SANDY_LOAM			2682710.854
00800434	SANDY_LOAM			2682575.487
00800435	SANDY_LOAM			2682371.643
00800436	SANDY_LOAM			2682331.396
00800437				
00800439				
00800440				
00800441				

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Installation & Retrieval Log

*** Optional or as needed**

SAMPLER SERIAL NO.	PROJECTED COORDINATES Y (NORTHING)	COORDINATE SYSTEM* (e.g., UTM Zone, Stateplane, etc.)	COORDINATE DATUM* (e.g., WGS 84)
00799439	219948.6281	PA South State Plane Feet	NAD83
00799440	220011.5625	PA South State Plane Feet	NAD83
00799441	220100.7819	PA South State Plane Feet	NAD83
00799442	220098.242	PA South State Plane Feet	NAD83
00799443	220085.422	PA South State Plane Feet	NAD83
00799444	220009.7993	PA South State Plane Feet	NAD83
00799445	220031.5863	PA South State Plane Feet	NAD83
00799446	220056.6537	PA South State Plane Feet	NAD83
00799447	220087.3751	PA South State Plane Feet	NAD83
00799448	220376.9585	PA South State Plane Feet	NAD83
00799449	220305.183	PA South State Plane Feet	NAD83
00799450	220235.3291	PA South State Plane Feet	NAD83
00799451	220185.422	PA South State Plane Feet	NAD83
00799452	220329.0077	PA South State Plane Feet	NAD83
00799453	220314.2562	PA South State Plane Feet	NAD83
00799454	220312.0319	PA South State Plane Feet	NAD83
00799455	220280.3873	PA South State Plane Feet	NAD83
00799456	220288.4602	PA South State Plane Feet	NAD83
00799457	220185.422	PA South State Plane Feet	NAD83
00799458	220185.422	PA South State Plane Feet	NAD83
00799459	220204.8231	PA South State Plane Feet	NAD83
00799460	220285.422	PA South State Plane Feet	NAD83
00799461	220391.672	PA South State Plane Feet	NAD83
00799462	220385.422	PA South State Plane Feet	NAD83
00799463	220385.422	PA South State Plane Feet	NAD83
00799464	220385.422	PA South State Plane Feet	NAD83
00799465	220403.6512	PA South State Plane Feet	NAD83
00799466	220485.422	PA South State Plane Feet	NAD83
00799467	220583.3387	PA South State Plane Feet	NAD83
00799468	220481.5158	PA South State Plane Feet	NAD83
00799469	220477.8265	PA South State Plane Feet	NAD83
00799470	220492.2572	PA South State Plane Feet	NAD83
00799471	220484.3804	PA South State Plane Feet	NAD83
00799472	220563.8074	PA South State Plane Feet	NAD83
00799473	220585.6053	PA South State Plane Feet	NAD83
00799474	220414.5583	PA South State Plane Feet	NAD83
00800425	220495.9111	PA South State Plane Feet	NAD83
00800426	220611.0619	PA South State Plane Feet	NAD83
00800427	220798.0008	PA South State Plane Feet	NAD83
00800428	220614.5583	PA South State Plane Feet	NAD83
00800429	220662.113	PA South State Plane Feet	NAD83
00800430	220684.3804	PA South State Plane Feet	NAD83
00800431	220649.7449	PA South State Plane Feet	NAD83
00800432	220568.334	PA South State Plane Feet	NAD83
00800433	220476.4351	PA South State Plane Feet	NAD83
00800434	220738.1337	PA South State Plane Feet	NAD83
00800435	220772.3059	PA South State Plane Feet	NAD83
00800436	220685.422	PA South State Plane Feet	NAD83
00800437			
00800439			
00800440			
00800441			

AMPLIFIED GEOCHEMICAL IMAGING ANALYTICAL RESULTS
210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE
STANTEC CONSULTING, WEST CHESTER, PA
AGI TARGET COMPOUNDS
REFORMATE RELEASE INVESTIGATION
ORDER #02038

DATAFILE	FIELD	DATE/ TIME									
NAME	ID	ANALYZED	DF	TPH, ug	GRPH, ug	DRPH, ug	MTBE, ug	t12DCE, ug	11DCA, ug	c12DCE, ug	CHCl3, ug
RL=				0.50	0.50	0.50	0.02	0.02	0.02	0.02	0.02
00799439	1	9/18/2018	1	<0.50	<0.50	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00799440	2	9/18/2018	1	6.57	1.54	5.21	<0.02	<0.02	<0.02	<0.02	<0.02
00799441	3	9/18/2018	1	7.33	<0.50	7.02	<0.02	<0.02	<0.02	<0.02	<0.02
00799442	4	9/17/2018	1	85.3	44.9	45.7	<0.02	<0.02	<0.02	<0.02	<0.02
00799443	5	9/18/2018	1	2.27	0.74	1.62	<0.02	<0.02	<0.02	<0.02	<0.02
00799444	6	9/18/2018	1	97.8	107	3.30	<0.02	<0.02	<0.02	<0.02	<0.02
00799445	7	9/18/2018	1	168	184	6.22	<0.02	<0.02	<0.02	<0.02	<0.02
00799446	8	9/18/2018	1	<0.50	<0.50	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00799447	9	9/18/2018	1	4.94	4.88	0.63	<0.02	<0.02	<0.02	<0.02	<0.02
00799448	28	9/17/2018	1	1.80	1.09	0.84	<0.02	<0.02	<0.02	<0.02	<0.02
00799449	21	9/18/2018	1	9.94	5.88	4.75	<0.02	<0.02	<0.02	<0.02	<0.02
00799450	14	9/17/2018	1	9.21	0.69	8.60	<0.02	<0.02	<0.02	<0.02	<0.02
00799451	13	9/18/2018	1	3.53	0.79	2.83	<0.02	<0.02	<0.02	<0.02	<0.02
00799452	20	9/17/2018	1	4.95	3.63	1.74	<0.02	<0.02	<0.02	<0.02	<0.02
00799453	19	9/17/2018	1	0.53	<0.50	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00799454	18	9/17/2018	1	14.1	15.7	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00799455	17	9/19/2018	1	199	204	19.3	<0.02	<0.02	<0.02	<0.02	<0.02
00799456	16	9/18/2018	1	134	151	1.19	<0.02	<0.02	<0.02	<0.02	<0.02
00799457	10	9/18/2018	1	10.7	3.37	7.77	<0.02	<0.02	<0.02	<0.02	<0.02
00799458	11	9/17/2018	1	2.85	2.97	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00799459	12	9/17/2018	1	48.0	50.6	3.31	<0.02	<0.02	<0.02	<0.02	<0.02
00799460	15	9/17/2018	1	8.09	<0.50	7.79	<0.02	<0.02	<0.02	<0.02	<0.02
00799461	23	9/18/2018	1	<0.50	<0.50	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00799462	24	9/18/2018	1	0.74	<0.50	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00799463	25	9/18/2018	1	0.52	<0.50	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00799464	26	9/18/2018	1	<0.50	<0.50	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00799465	27	9/18/2018	1	0.63	<0.50	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00799466	34	9/17/2018	1	<0.50	<0.50	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02

AMPLIFIED GEOCHEMICAL IMAGING ANALYTICAL RESULTS
210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE
STANTEC CONSULTING, WEST CHESTER, PA
AGI TARGET COMPOUNDS
REFORMATE RELEASE INVESTIGATION
ORDER #02038

DATAFILE NAME	FIELD ID	DATE/ TIME ANALYZED	DF	TPH, ug	GRPH, ug	DRPH, ug	MTBE, ug	t12DCE, ug	11DCA, ug	c12DCE, ug	CHCl3, ug
00799467	40	9/18/2018	1	8.70	7.92	1.71	<0.02	<0.02	<0.02	<0.02	<0.02
00799468	33	9/19/2018	1	135	150	2.21	<0.02	<0.02	<0.02	<0.02	<0.02
00799469	32	9/17/2018	1	12.0	13.3	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00799470	31	9/18/2018	1	29.6	33.1	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00799471	30	9/18/2018	1	40.8	42.9	2.89	<0.02	<0.02	<0.02	<0.02	<0.02
00799472	37	9/18/2018	1	0.88	0.69	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00799473	38	9/18/2018	1	244	252	21.3	<0.02	<0.02	<0.02	<0.02	<0.02
00799474	22	9/18/2018	1	0.88	0.74	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00800425	29	9/17/2018	1	2.17	2.14	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00800426	36	9/18/2018	1	<0.50	<0.50	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00800427	46	9/18/2018	1	<0.50	<0.50	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00800428	39	9/18/2018	1	280	311	4.78	<0.02	<0.02	<0.02	<0.02	<0.02
00800429	43	9/18/2018	1	303	336	6.33	<0.02	<0.02	<0.02	<0.02	<0.02
00800430	44	9/18/2018	1	<0.50	<0.50	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00800431	45	9/18/2018	1	<0.50	<0.50	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00800432	41	9/18/2018	1	77.8	84.8	2.84	<0.02	<0.02	<0.02	<0.02	<0.02
00800433	35	9/18/2018	1	<0.50	<0.50	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00800434	48	9/17/2018	1	600	584	84.1	<0.02	<0.02	<0.02	<0.02	<0.02
00800435	47	9/17/2018	1	<0.50	<0.50	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00800436	42	9/18/2018	1	3.25	3.62	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00800437	trip blank 1	9/18/2018	1	<0.50	<0.50	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00800439	trip blank 2	9/18/2018	1	<0.50	<0.50	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00800440	trip blank 3	9/18/2018	1	<0.50	<0.50	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
00800441	trip blank 4	9/18/2018	1	<0.50	<0.50	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
BLK-1	Method Blank	9/17/2018	1	<0.50	<0.50	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02
BLK-2	Method Blank	9/18/2018	1	<0.50	<0.50	<0.50	<0.02	<0.02	<0.02	<0.02	<0.02

AMPLIFIED GEOCHEMICAL IMAGING ANALYTICAL RESULTS
210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE
STANTEC CONSULTING, WEST CHESTER, PA
AGI TARGET COMPOUNDS
REFORMATE RELEASE INVESTIGATION
ORDER #02038

DATAFILE											
NAME	111TCA, ug	12DCA, ug	BENZ, ug	CCl4, ug	TCE, ug	112TCA, ug	TOL, ug	OCT, ug	PCE, ug	ClBENZ, ug	1112TetCA, ug
RL=	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
00799439	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.26	<0.02	<0.02	<0.02	<0.02
00799440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.75	0.09	<0.02	<0.02	<0.02
00799441	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00799442	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	1.70	0.13	<0.02	<0.02	<0.02
00799443	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00799444	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02
00799445	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	<0.02	<0.02
00799446	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00799447	<0.02	<0.02	0.09	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02
00799448	<0.02	<0.02	0.11	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02
00799449	<0.02	<0.02	0.07	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02
00799450	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00799451	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00799452	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00799453	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00799454	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00799455	<0.02	<0.02	99.8	<0.02	<0.02	<0.02	81.4	0.24	<0.02	<0.02	<0.02
00799456	<0.02	<0.02	17.3	<0.02	<0.02	<0.02	0.58	0.04	<0.02	<0.02	<0.02
00799457	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00799458	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00799459	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00799460	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00799461	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00799462	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00799463	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.15	<0.02	<0.02
00799464	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02
00799465	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00799466	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

AMPLIFIED GEOCHEMICAL IMAGING ANALYTICAL RESULTS
210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE
STANTEC CONSULTING, WEST CHESTER, PA
AGI TARGET COMPOUNDS
REFORMATE RELEASE INVESTIGATION
ORDER #02038

DATAFILE NAME	111TCA, ug	12DCA, ug	BENZ, ug	CCl4, ug	TCE, ug	112TCA, ug	TOL, ug	OCT, ug	PCE, ug	ClBENZ, ug	1112TetCA, ug
00799467	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02
00799468	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02
00799469	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00799470	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.02	<0.02	<0.02
00799471	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.30	0.04	<0.02	<0.02	<0.02
00799472	<0.02	<0.02	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00799473	<0.02	<0.02	50.5	<0.02	<0.02	<0.02	0.27	<0.02	<0.02	<0.02	<0.02
00799474	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	<0.02	<0.02	<0.02
00800425	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00800426	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00800427	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.02
00800428	<0.02	<0.02	28.7	<0.02	<0.02	<0.02	0.05	<0.02	<0.02	<0.02	<0.02
00800429	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.23	<0.02	<0.02	<0.02	<0.02
00800430	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00800431	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00800432	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00800433	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02
00800434	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02
00800435	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02
00800436	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.08	<0.02	<0.02	<0.02	<0.02
00800437	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00800439	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00800440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
00800441	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
BLK-1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
BLK-2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

AMPLIFIED GEOCHEMICAL IMAGING ANALYTICAL RESULTS
210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE
STANTEC CONSULTING, WEST CHESTER, PA
AGI TARGET COMPOUNDS
REFORMATE RELEASE INVESTIGATION
ORDER #02038

DATAFILE										
NAME	ETBENZ, ug	mpXYL, ug	oXYL, ug	1122TetCA, ug	135TMB, ug	124TMB, ug	13DCB, ug	14DCB, ug	12DCB, ug	UNDEC, ug
RL=	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05
00799439	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799440	0.10	0.25	0.11	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.05
00799441	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799442	0.03	0.11	0.05	<0.02	0.04	0.09	<0.02	<0.02	<0.02	0.33
00799443	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799444	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799445	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799446	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799447	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799448	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799449	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799450	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799451	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799452	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799453	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799454	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799455	0.13	1.36	0.45	<0.02	0.05	0.04	<0.02	<0.02	<0.02	0.15
00799456	0.10	0.29	0.03	<0.02	0.03	0.05	<0.02	<0.02	<0.02	<0.05
00799457	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799458	<0.02	0.07	0.06	<0.02	0.10	0.09	<0.02	<0.02	<0.02	<0.05
00799459	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799460	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799461	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799462	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799463	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799464	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799465	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799466	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05

AMPLIFIED GEOCHEMICAL IMAGING ANALYTICAL RESULTS
210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE
STANTEC CONSULTING, WEST CHESTER, PA
AGI TARGET COMPOUNDS
REFORMATE RELEASE INVESTIGATION
ORDER #02038

DATAFILE NAME	ETBENZ, ug	mpXYL, ug	oXYL, ug	1122TetCA, ug	135TMB, ug	124TMB, ug	13DCB, ug	14DCB, ug	12DCB, ug	UNDEC, ug
00799467	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799468	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799469	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799470	0.04	0.07	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799471	0.05	0.16	0.07	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.05
00799472	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00799473	0.14	0.40	0.03	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	0.15
00799474	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00800425	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00800426	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00800427	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00800428	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00800429	0.03	0.09	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00800430	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00800431	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00800432	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00800433	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00800434	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.55
00800435	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00800436	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00800437	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00800439	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00800440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
00800441	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
BLK-1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
BLK-2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05

AMPLIFIED GEOCHEMICAL IMAGING ANALYTICAL RESULTS
210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE
STANTEC CONSULTING, WEST CHESTER, PA
AGI TARGET COMPOUNDS
REFORMATE RELEASE INVESTIGATION
ORDER #02038

DATAFILE							
NAME	NAPH, ug	TRIDEC, ug	2MeNAPH, ug	Acenaphthylene, ug	PENTADEC, ug	Acenaphthene, ug	Fluorene, ug
RL=	0.05	0.05	0.05	0.05	0.05	0.05	0.05
00799439	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799440	0.26	0.07	0.08	<0.05	0.06	<0.05	<0.05
00799441	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799442	0.24	0.09	0.07	<0.05	<0.05	0.61	<0.05
00799443	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799444	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799445	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799446	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799447	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799448	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799449	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799450	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799451	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799452	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799453	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799454	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799455	<0.05	0.22	0.05	<0.05	<0.05	<0.05	<0.05
00799456	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799457	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799458	2.46	<0.05	0.43	<0.05	<0.05	0.51	0.22
00799459	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799460	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799461	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799462	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799463	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799464	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799465	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799466	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

AMPLIFIED GEOCHEMICAL IMAGING ANALYTICAL RESULTS
210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE
STANTEC CONSULTING, WEST CHESTER, PA
AGI TARGET COMPOUNDS
REFORMATE RELEASE INVESTIGATION
ORDER #02038

DATAFILE NAME	NAPH, ug	TRIDEC, ug	2MeNAPH, ug	Acenaphthylene, ug	PENTADEC, ug	Acenaphthene, ug	Fluorene, ug
00799467	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799468	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799469	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799470	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799471	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799472	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799473	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00799474	0.76	<0.05	0.47	0.07	<0.05	0.53	0.28
00800425	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00800426	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00800427	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00800428	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00800429	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00800430	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00800431	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00800432	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00800433	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00800434	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00800435	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00800436	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00800437	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00800439	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00800440	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00800441	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BLK-1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BLK-2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

AMPLIFIED GEOCHEMICAL IMAGING ANALYTICAL RESULTS
210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE
STANTEC CONSULTING, WEST CHESTER, PA
AGI TARGET COMPOUNDS
ESTIMATED SOIL-GAS CONCENTRATIONS
REFORMATE RELEASE INVESTIGATION
ORDER #02038

DATAFILE NAME	FIELD ID	DATE/ TIME INSTALLED		DATE/ TIME RETRIEVED		DATE/ TIME RECEIVED		DATE/ TIME ANALYZED		DF	estimated TPH, ug/m^3	estimated GRPH, ug/m^3
Average RL=											23.5	60.8
00799439	1	9/10/18 10:00 AM	EDT	9/14/18 8:27 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 10:06 PM	EDT	1	<34.2	<88.7
00799440	2	9/10/18 10:30 AM	EDT	9/14/18 8:29 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 9:34 PM	EDT	1	409	259
00799441	3	9/10/18 10:45 AM	EDT	9/14/18 8:32 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 5:50 PM	EDT	1	455	<89.2
00799442	4	9/10/18 11:00 AM	EDT	9/14/18 8:42 AM	EDT	9/17/18 10:20 AM	EDT	9/17/18 6:00 PM	EDT	1	2720 E	3610 E
00799443	5	9/10/18 11:10 AM	EDT	9/14/18 8:44 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 8:31 PM	EDT	1	52.1	45.5
00799444	6	9/10/18 11:30 AM	EDT	9/14/18 8:51 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 12:04 PM	EDT	1	5530 E	14700 E
00799445	7	9/10/18 11:50 AM	EDT	9/14/18 8:55 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 2:30 PM	EDT	1	9360 E	24500 E
00799446	8	9/10/18 12:10 PM	EDT	9/14/18 8:57 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 2:05 AM	EDT	1	<34.7	<90.0
00799447	9	9/10/18 12:20 PM	EDT	9/14/18 8:59 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 4:07 AM	EDT	1	315	784
00799448	28	9/10/18 12:40 PM	EDT	9/14/18 9:05 AM	EDT	9/17/18 10:20 AM	EDT	9/17/18 5:30 PM	EDT	1	42.1	66.5
00799449	21	9/10/18 12:55 PM	EDT	9/14/18 9:07 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 4:37 AM	EDT	1	350	530
00799450	14	9/10/18 1:00 PM	EDT	9/14/18 9:09 AM	EDT	9/17/18 10:20 AM	EDT	9/17/18 4:59 PM	EDT	1	325	69.7
00799451	13	9/10/18 1:20 PM	EDT	9/14/18 9:11 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 5:18 PM	EDT	1	80.9	49.6
00799452	20	9/10/18 1:40 PM	EDT	9/14/18 9:16 AM	EDT	9/17/18 10:20 AM	EDT	9/17/18 8:32 PM	EDT	1	319	599
00799453	19	9/10/18 1:55 PM	EDT	9/14/18 9:18 AM	EDT	9/17/18 10:20 AM	EDT	9/17/18 3:58 PM	EDT	1	37.2	<91.1
00799454	18	9/10/18 2:05 PM	EDT	9/14/18 9:21 AM	EDT	9/17/18 10:20 AM	EDT	9/17/18 6:30 PM	EDT	1	878	2400
00799455	17	9/10/18 2:15 PM	EDT	9/14/18 9:23 AM	EDT	9/17/18 10:20 AM	EDT	9/19/18 12:46 PM	EDT	1	3950 E	9700 E
00799456	16	9/10/18 2:30 PM	EDT	9/14/18 9:25 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 12:53 PM	EDT	1	4330 E	11700 E
00799457	10	9/10/18 2:45 PM	EDT	9/14/18 9:31 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 6:22 PM	EDT	1	382	316
00799458	11	9/10/18 2:55 PM	EDT	9/14/18 9:36 AM	EDT	9/17/18 10:20 AM	EDT	9/17/18 11:33 PM	EDT	1	189	497
00799459	12	9/10/18 3:05 PM	EDT	9/14/18 9:38 AM	EDT	9/17/18 10:20 AM	EDT	9/17/18 7:31 PM	EDT	1	1010 E	2600 E
00799460	15	9/10/18 3:20 PM	EDT	9/14/18 9:41 AM	EDT	9/17/18 10:20 AM	EDT	9/17/18 10:03 PM	EDT	1	182	<32.4
00799461	23	9/10/18 3:30 PM	EDT	9/14/18 9:44 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 12:34 PM	EDT	1	<12.6	<32.4
00799462	24	9/10/18 3:40 PM	EDT	9/14/18 9:46 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 2:36 AM	EDT	1	18.3	<32.5
00799463	25	9/10/18 3:50 PM	EDT	9/14/18 9:48 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 7:40 AM	EDT	1	37.1	<92.3
00799464	26	9/10/18 4:00 PM	EDT	9/14/18 9:50 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 6:54 PM	EDT	1	<35.8	<92.4
00799465	27	9/10/18 4:05 PM	EDT	9/14/18 9:52 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 1:04 AM	EDT	1	44.4	<92.4
00799466	34	9/10/18 4:10 PM	EDT	9/14/18 9:54 AM	EDT	9/17/18 10:20 AM	EDT	9/17/18 8:01 PM	EDT	1	<35.8	<92.5
00799467	40	9/10/18 4:20 PM	EDT	9/14/18 9:56 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 11:42 PM	EDT	1	560	1280
00799468	33	9/10/18 4:25 PM	EDT	9/14/18 9:58 AM	EDT	9/17/18 10:20 AM	EDT	9/19/18 12:14 PM	EDT	1	7800 E	20900 E
00799469	32	9/10/18 4:30 PM	EDT	9/14/18 10:00 AM	EDT	9/17/18 10:20 AM	EDT	9/17/18 4:29 PM	EDT	1	766	2090
00799470	31	9/10/18 4:35 PM	EDT	9/14/18 10:02 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 7:26 PM	EDT	1	1820 E	4980 E
00799471	30	9/10/18 4:40 PM	EDT	9/14/18 10:04 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 8:41 AM	EDT	1	2480 E	6370 E
00799472	37	9/10/18 4:45 PM	EDT	9/14/18 10:06 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 1:25 PM	EDT	1	62.3	125
00799473	38	9/10/18 4:50 PM	EDT	9/14/18 10:08 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 6:09 AM	EDT	1	13900 E	34300 E
00799474	22	9/10/18 5:00 PM	EDT	9/14/18 10:10 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 7:10 AM	EDT	1	35.0	76.5
00800425	29	9/10/18 5:05 PM	EDT	9/14/18 10:12 AM	EDT	9/17/18 10:20 AM	EDT	9/17/18 7:01 PM	EDT	1	83.5	208
00800426	36	9/10/18 5:10 PM	EDT	9/14/18 10:14 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 5:38 AM	EDT	1	<20.3	<52.4
00800427	46	9/10/18 5:20 PM	EDT	9/14/18 10:16 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 9:02 PM	EDT	1	<20.4	<52.5

AMPLIFIED GEOCHEMICAL IMAGING ANALYTICAL RESULTS
210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE
STANTEC CONSULTING, WEST CHESTER, PA
AGI TARGET COMPOUNDS
ESTIMATED SOIL-GAS CONCENTRATIONS
REFORMATE RELEASE INVESTIGATION
ORDER #02038

DATAFILE	FIELD	DATE/ TIME		DATE/ TIME		DATE/ TIME		DATE/ TIME			estimated	estimated
NAME	ID	INSTALLED		RETRIEVED		RECEIVED		ANALYZED		DF	TPH, ug/m^3	GRPH, ug/m^3
00800428	39	9/10/18 5:30 PM	EDT	9/14/18 10:18 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 1:58 PM	EDT	1	8960 E	23700 E
00800429	43	9/10/18 5:35 PM	EDT	9/14/18 10:20 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 12:20 PM	EDT	1	9680 E	25500 E
00800430	44	9/10/18 5:40 PM	EDT	9/14/18 10:22 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 6:39 AM	EDT	1	<20.4	<52.6
00800431	45	9/10/18 5:45 PM	EDT	9/14/18 10:24 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 3:02 PM	EDT	1	<20.4	<52.6
00800432	41	9/10/18 5:50 PM	EDT	9/14/18 10:26 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 11:16 AM	EDT	1	2620 E	6910 E
00800433	35	9/10/18 6:00 PM	EDT	9/14/18 10:28 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 11:48 AM	EDT	1	<20.5	<52.7
00800434	48	9/10/18 6:10 PM	EDT	9/14/18 10:30 AM	EDT	9/17/18 10:20 AM	EDT	9/17/18 10:33 PM	EDT	1	18800 E	43300 E
00800435	47	9/10/18 6:15 PM	EDT	9/14/18 10:32 AM	EDT	9/17/18 10:20 AM	EDT	9/17/18 11:03 PM	EDT	1	<20.5	<52.8
00800436	42	9/10/18 6:20 PM	EDT	9/14/18 10:34 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 5:08 AM	EDT	1	124	347
00800437	trip blank 1	9/10/18 6:30 PM	EDT	9/14/18 10:45 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 8:11 AM	EDT	1	<24.1	<62.0
00800439	trip blank 2	9/10/18 6:30 PM	EDT	9/14/18 10:45 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 3:34 PM	EDT	1	<24.1	<62.0
00800440	trip blank 3	9/10/18 6:30 PM	EDT	9/14/18 10:45 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 1:35 AM	EDT	1	<24.1	<62.0
00800441	trip blank 4	9/10/18 6:30 PM	EDT	9/14/18 10:45 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 7:58 PM	EDT	1	<24.1	<62.0
BLK-1	Method Blank	9/10/18 3:21 PM	EDT	9/14/18 9:45 AM	EDT	9/17/18 10:20 AM	EDT	9/17/18 3:28 PM	EDT	1	<23.5	<60.8
BLK-2	Method Blank	9/10/18 3:21 PM	EDT	9/14/18 9:45 AM	EDT	9/17/18 10:20 AM	EDT	9/18/18 9:41 AM	EDT	1	<23.5	<60.8

AMPLIFIED GEOCHEMICAL IMAGING ANALYTICAL RESULTS
210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE
STANTEC CONSULTING, WEST CHESTER, PA
AGI TARGET COMPOUNDS
ESTIMATED SOIL-GAS CONCENTRATIONS
REFORMATE RELEASE INVESTIGATION
ORDER #02038

DATAFILE	estimated									
NAME	DRPH, ug/m^3	MTBE, ug/m^3	t12DCE, ug/m^3	11DCA, ug/m^3	c12DCE, ug/m^3	CHCl3, ug/m^3	111TCA, ug/m^3	12DCA, ug/m^3	BENZ, ug/m^3	CCl4, ug/m^3
Average RL=	23.5	132	265	93.5	89.0	48.9	30.4	24.1	24.0	27.3
00799439	<34.2	<196	<398	<140	<133	<72.8	<44.9	<35.8	<35.5	<40.3
00799440	327	<197	<398	<140	<133	<72.9	<45.0	<35.9	<35.6	<40.4
00799441	437	<197	<398	<140	<133	<73.0	<45.0	<35.9	<35.6	<40.4
00799442	1490 E	<111	<224	<79.0	<75.1	<41.2	<25.4	<20.3	<20.1	<22.8
00799443	37.7	<69.3	<140	<49.4	<46.9	<25.7	<15.9	<12.7	23.1	<14.3
00799444	213	<197	<398	<140	<133	<73.1	<45.1	<36.0	<35.7	<40.5
00799445	391	<197	<399	<140	<133	<73.2	<45.2	<36.0	<35.7	<40.6
00799446	<34.7	<197	<399	<140	<134	<73.2	<45.3	<36.1	50.8	<40.6
00799447	43.4	<197	<399	<141	<134	<73.3	<45.3	<36.1	123	<40.7
00799448	20.2	<69.6	<140	<49.5	<47.1	<25.8	<16.0	<12.7	50.7	<14.3
00799449	172	<111	<225	<79.3	<75.4	<41.4	<25.6	<20.4	55.1	<23.0
00799450	304	<111	<225	<79.3	<75.4	<41.4	<25.6	<20.4	21.8	<23.0
00799451	65.4	<69.7	<141	<49.6	<47.2	<25.9	<16.0	<12.8	15.1	<14.4
00799452	116	<198	<399	<141	<134	<73.6	<45.6	<36.3	51.1	<40.9
00799453	<35.2	<198	<400	<141	<134	<73.6	<45.6	<36.3	49.8	<41.0
00799454	<35.3	<198	<400	<141	<134	<73.6	<45.7	<36.3	64.0	<41.0
00799455	419	<69.8	<141	<49.7	<47.3	<26.0	<16.1	<12.8	11500 E	<14.4
00799456	45.9	<112	<225	<79.6	<75.7	<41.6	<25.8	<20.5	4520	<23.2
00799457	280	<112	<225	<79.6	<75.8	<41.6	<25.8	<20.5	<20.4	<23.2
00799458	<35.5	<199	<400	<141	<134	<73.8	<45.8	<36.4	44.6	<41.1
00799459	77.0	<70.0	<141	<49.8	<47.4	<26.0	<16.2	<12.8	<12.7	<14.5
00799460	176	<70.0	<141	<49.8	<47.4	<26.0	<16.2	<12.9	<12.8	<14.5
00799461	<12.6	<70.1	<141	<49.8	<47.4	<26.0	<16.2	<12.9	<12.8	<14.5
00799462	<12.6	<70.1	<141	<49.8	<47.4	<26.1	<16.2	<12.9	<12.8	<14.5
00799463	<35.7	<199	<400	<142	<135	<74.0	<46.0	<36.6	<36.3	<41.3
00799464	<35.8	<199	<401	<142	<135	<74.0	<46.0	<36.6	<36.3	<41.3
00799465	<35.8	<199	<401	<142	<135	<74.1	<46.1	<36.6	<36.3	<41.3
00799466	<35.8	<199	<401	<142	<135	<74.1	<46.1	<36.6	<36.3	<41.4
00799467	117	<199	<401	<142	<135	<74.1	<46.1	<36.6	<36.4	<41.4
00799468	150	<199	<401	<142	<135	<74.1	<46.1	<36.6	<36.4	<41.4
00799469	<35.9	<199	<401	<142	<135	<74.1	<46.1	<36.7	<36.4	<41.4
00799470	<35.9	<199	<401	<142	<135	<74.1	<46.1	<36.7	<36.4	<41.4
00799471	194	<199	<401	<142	<135	<74.2	<46.2	<36.7	<36.4	<41.4
00799472	<36.0	<199	<401	<142	<135	<74.2	<46.2	<36.7	91.1	<41.4
00799473	1330 E	<200	<401	<142	<135	<74.2	<46.2	<36.7	19100 E	<41.5
00799474	<20.3	<113	<226	<80.0	<76.1	<41.8	<26.1	<20.7	<20.5	<23.4
00800425	<20.3	<113	<226	<80.0	<76.1	<41.9	<26.1	<20.7	<20.6	<23.4
00800426	<20.3	<113	<226	<80.0	<76.1	<41.9	<26.1	<20.7	<20.6	<23.4
00800427	<20.4	<113	<226	<80.1	<76.2	<41.9	<26.1	<20.7	<20.6	<23.4

AMPLIFIED GEOCHEMICAL IMAGING ANALYTICAL RESULTS
210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE
STANTEC CONSULTING, WEST CHESTER, PA
AGI TARGET COMPOUNDS
ESTIMATED SOIL-GAS CONCENTRATIONS
REFORMATE RELEASE INVESTIGATION
ORDER #02038

DATAFILE NAME	estimated DRPH, ug/m^3	MTBE, ug/m^3	t12DCE, ug/m^3	11DCA, ug/m^3	c12DCE, ug/m^3	CHCl3, ug/m^3	111TCA, ug/m^3	12DCA, ug/m^3	BENZ, ug/m^3	CCl4, ug/m^3
00800428	179	<113	<226	<80.1	<76.2	<41.9	<26.1	<20.7	6860 E	<23.4
00800429	235	<113	<226	<80.1	<76.2	<41.9	<26.1	<20.7	<20.6	<23.5
00800430	<20.4	<113	<226	<80.1	<76.2	<41.9	<26.1	<20.8	<20.6	<23.5
00800431	<20.4	<113	<226	<80.1	<76.2	<41.9	<26.1	<20.8	<20.6	<23.5
00800432	109	<113	<226	<80.1	<76.3	<41.9	<26.1	<20.8	<20.6	<23.5
00800433	<20.5	<113	<226	<80.2	<76.3	<42.0	<26.2	<20.8	<20.6	<23.5
00800434	2840 E	<113	<226	<80.2	<76.3	<42.0	<26.2	<20.8	<20.6	<23.5
00800435	<20.5	<113	<226	<80.2	<76.3	<42.0	<26.2	<20.8	<20.6	<23.5
00800436	<20.5	<113	<226	<80.2	<76.3	<42.0	<26.2	<20.8	<20.6	<23.5
00800437	<24.1	<132	<266	<94.1	<89.6	<49.3	<30.7	<24.4	<24.2	<27.6
00800439	<24.1	<132	<266	<94.1	<89.6	<49.3	<30.7	<24.4	<24.2	<27.6
00800440	<24.1	<132	<266	<94.1	<89.6	<49.3	<30.7	<24.4	<24.2	<27.6
00800441	<24.1	<132	<266	<94.1	<89.6	<49.3	<30.7	<24.4	<24.2	<27.6
BLK-1	<23.5	<132	<265	<93.5	<89.0	<48.9	<30.4	<24.1	<24.0	<27.3
BLK-2	<23.5	<132	<265	<93.5	<89.0	<48.9	<30.4	<24.1	<24.0	<27.3

AMPLIFIED GEOCHEMICAL IMAGING ANALYTICAL RESULTS
210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE
STANTEC CONSULTING, WEST CHESTER, PA
AGI TARGET COMPOUNDS
ESTIMATED SOIL-GAS CONCENTRATIONS
REFORMATE RELEASE INVESTIGATION
ORDER #02038

DATAFILE				estimated			estimated			
NAME	TCE, ug/m^3	112TCA, ug/m^3	TOL, ug/m^3	OCT, ug/m^3	PCE, ug/m^3	ClBENZ, ug/m^3	1112TetCA, ug/m^3	ETBENZ, ug/m^3	mpXYL, ug/m^3	oXYL, ug/m^3
Average RL=	10.5	1.92	2.77	2.86	2.13	1.39	1.06	1.35	1.23	1.69
00799439	<15.5	<2.79	45.1	<4.17	<3.10	<2.03	<1.53	<1.96	2.13	<2.45
00799440	<15.5	<2.81	125	17.3	<3.12	<2.04	<1.54	9.26	21.9	12.6
00799441	<15.5	<2.81	<4.06	<4.19	<3.12	<2.04	<1.54	<1.97	<1.79	<2.47
00799442	<8.76	<1.59	153	14.0	<1.76	<1.15	<0.87	1.54	5.26	3.20
00799443	<5.48	<0.99	<1.43	<1.48	<1.10	<0.72	<0.54	<0.69	<0.63	<0.87
00799444	<15.6	<2.82	4.65	<4.21	<3.14	<2.05	<1.55	<1.98	2.42	<2.48
00799445	<15.6	<2.83	<4.09	13.5	<3.14	<2.05	<1.55	<1.98	<1.80	<2.48
00799446	<15.6	<2.84	<4.10	<4.23	<3.15	<2.06	<1.56	<1.99	<1.81	<2.49
00799447	<15.6	<2.84	7.33	<4.23	<3.15	<2.06	<1.56	<1.99	<1.81	<2.49
00799448	<5.52	<1.00	2.39	<1.49	<1.11	<0.73	<0.55	<0.70	<0.64	<0.88
00799449	<8.85	<1.61	3.19	<2.40	<1.79	<1.17	<0.88	<1.13	<1.03	<1.41
00799450	<8.85	<1.61	<2.32	<2.40	<1.79	<1.17	<0.88	<1.13	<1.03	<1.41
00799451	<5.54	<1.01	<1.45	<1.50	<1.12	<0.73	<0.55	<0.71	<0.64	<0.88
00799452	<15.8	<2.87	<4.14	<4.27	<3.18	<2.08	<1.58	<2.01	<1.83	<2.52
00799453	<15.8	<2.87	<4.15	<4.28	<3.19	<2.09	<1.58	<2.02	<1.83	<2.52
00799454	<15.8	<2.88	<4.15	<4.29	<3.19	<2.09	<1.58	<2.02	<1.84	<2.53
00799455	<5.56	<1.01	3770 E	16.2	<1.13	<0.74	<0.56	4.43	42.0	17.0
00799456	<8.92	<1.63	56.2	5.13	<1.81	<1.18	<0.90	5.33	14.7	2.30
00799457	<8.93	<1.63	<2.35	<2.43	<1.81	<1.18	<0.90	<1.14	<1.04	<1.43
00799458	<15.8	<2.89	<4.17	<4.31	<3.21	<2.10	<1.59	<2.03	6.10	7.67
00799459	<5.59	<1.02	<1.47	<1.52	<1.13	<0.74	<0.56	<0.72	<0.65	<0.90
00799460	<5.59	<1.02	<1.47	<1.52	<1.13	<0.74	<0.56	<0.72	<0.65	<0.90
00799461	<5.60	<1.02	<1.48	<1.52	<1.14	<0.74	<0.56	<0.72	<0.65	<0.90
00799462	<5.60	<1.02	<1.48	<1.52	<1.14	<0.74	<0.56	<0.72	<0.65	<0.90
00799463	<15.9	<2.91	<4.20	<4.33	24.3	<2.12	<1.60	<2.04	<1.86	<2.56
00799464	<15.9	<2.92	<4.20	<4.34	6.59	<2.12	<1.61	<2.05	<1.86	<2.56
00799465	<15.9	<2.92	<4.20	<4.34	<3.24	<2.12	<1.61	<2.05	<1.86	<2.56
00799466	<15.9	<2.92	<4.21	<4.34	<3.24	<2.12	<1.61	<2.05	<1.87	<2.56
00799467	<16.0	<2.92	<4.21	<4.35	4.21	<2.12	<1.61	<2.05	<1.87	<2.57
00799468	<16.0	<2.92	<4.21	<4.35	9.96	<2.13	<1.61	<2.05	<1.87	<2.57
00799469	<16.0	<2.92	<4.22	<4.35	<3.25	<2.13	<1.61	<2.05	<1.87	<2.57
00799470	<16.0	<2.93	10.0	<4.35	<3.25	<2.13	<1.61	3.73	6.55	4.26
00799471	<16.0	<2.93	54.8	8.02	<3.25	<2.13	<1.61	5.10	15.0	7.99
00799472	<16.0	<2.93	<4.22	<4.36	<3.25	<2.13	<1.62	<2.06	<1.87	<2.57
00799473	<16.0	<2.93	48.5	<4.36	<3.25	<2.13	<1.62	13.3	35.9	4.26
00799474	<9.02	<1.65	7.36	<2.46	<1.84	<1.20	<0.91	<1.16	1.79	<1.45
00800425	<9.03	<1.65	<2.38	<2.46	<1.84	<1.20	<0.91	<1.16	<1.06	<1.45
00800426	<9.03	<1.66	<2.39	<2.46	<1.84	<1.20	<0.91	<1.16	<1.06	<1.46
00800427	<9.04	<1.66	<2.39	<2.47	4.11	<1.21	<0.91	<1.16	<1.06	<1.46

AMPLIFIED GEOCHEMICAL IMAGING ANALYTICAL RESULTS
210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE
STANTEC CONSULTING, WEST CHESTER, PA
AGI TARGET COMPOUNDS
ESTIMATED SOIL-GAS CONCENTRATIONS
REFORMATE RELEASE INVESTIGATION
ORDER #02038

DATAFILE				estimated			estimated			
NAME	TCE, ug/m^3	112TCA, ug/m^3	TOL, ug/m^3	OCT, ug/m^3	PCE, ug/m^3	ClBENZ, ug/m^3	1112TetCA, ug/m^3	ETBENZ, ug/m^3	mpXYL, ug/m^3	oXYL, ug/m^3
00800428	<9.04	<1.66	5.25	<2.47	<1.84	<1.21	<0.92	<1.17	1.74	<1.46
00800429	<9.05	<1.66	23.6	<2.47	<1.84	<1.21	<0.92	1.62	4.75	2.28
00800430	<9.05	<1.66	<2.39	<2.47	<1.84	<1.21	<0.92	<1.17	<1.06	<1.46
00800431	<9.05	<1.66	<2.39	<2.47	<1.85	<1.21	<0.92	<1.17	<1.06	<1.46
00800432	<9.06	<1.66	<2.40	<2.47	<1.85	<1.21	<0.92	<1.17	<1.06	<1.46
00800433	<9.06	<1.66	<2.40	<2.48	2.40	<1.21	<0.92	<1.17	<1.07	<1.46
00800434	<9.07	<1.67	3.85	<2.48	<1.85	<1.21	<0.92	<1.17	<1.07	<1.47
00800435	<9.08	<1.67	<2.40	<2.48	2.31	<1.21	<0.92	<1.17	<1.07	<1.47
00800436	<9.08	<1.67	9.12	<2.48	<1.85	<1.21	<0.92	<1.17	<1.07	<1.47
00800437	<10.7	<1.96	<2.82	<2.91	<2.17	<1.42	<1.08	<1.38	<1.25	<1.72
00800439	<10.7	<1.96	<2.82	<2.91	<2.17	<1.42	<1.08	<1.38	<1.25	<1.72
00800440	<10.7	<1.96	<2.82	<2.91	<2.17	<1.42	<1.08	<1.38	<1.25	<1.72
00800441	<10.7	<1.96	<2.82	<2.91	<2.17	<1.42	<1.08	<1.38	<1.25	<1.72
BLK-1	<10.5	<1.92	<2.77	<2.86	<2.13	<1.39	<1.06	<1.35	<1.23	<1.69
BLK-2	<10.5	<1.92	<2.77	<2.86	<2.13	<1.39	<1.06	<1.35	<1.23	<1.69

AMPLIFIED GEOCHEMICAL IMAGING ANALYTICAL RESULTS
210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE
STANTEC CONSULTING, WEST CHESTER, PA
AGI TARGET COMPOUNDS
ESTIMATED SOIL-GAS CONCENTRATIONS
REFORMATE RELEASE INVESTIGATION
ORDER #02038

DATAFILE							estimated	estimated	estimated
NAME	1122TetCA, ug/m^3	135TMB, ug/m^3	124TMB, ug/m^3	13DCB, ug/m^3	14DCB, ug/m^3	12DCB, ug/m^3	UNDEC, ug/m^3	NAPH, ug/m^3	TRIDEC, ug/m^3
Average RL=	1.06	1.81	1.37	1.11	1.12	1.06	2.57	2.57	2.57
00799439	<1.53	<2.63	<2.00	<1.61	<1.63	<1.55	<3.73	<3.73	<3.73
00799440	<1.54	<2.64	2.01	<1.62	<1.63	<1.55	<3.75	18.2	5.18
00799441	<1.54	<2.65	<2.01	<1.62	<1.64	<1.56	<3.76	<3.76	<3.76
00799442	<0.87	2.73	4.80	<0.92	<0.92	<0.88	12.9	9.74	3.77
00799443	<0.54	<0.94	<0.71	<0.57	<0.58	<0.55	<1.33	<1.33	<1.33
00799444	<1.55	<2.66	<2.02	<1.63	<1.64	<1.56	<3.77	<3.77	<3.77
00799445	<1.55	<2.67	<2.02	<1.63	<1.65	<1.57	<3.78	<3.78	<3.78
00799446	<1.56	<2.67	<2.03	<1.64	<1.65	<1.57	<3.79	<3.79	<3.79
00799447	<1.56	<2.68	<2.03	<1.64	<1.65	<1.57	<3.80	<3.80	<3.80
00799448	<0.55	<0.95	<0.72	<0.58	<0.58	<0.56	<1.34	<1.34	<1.34
00799449	<0.88	<1.52	<1.15	<0.93	<0.94	<0.89	<2.15	<2.15	<2.15
00799450	<0.88	<1.52	<1.15	<0.93	<0.94	<0.89	<2.15	<2.15	<2.15
00799451	<0.55	<0.95	<0.72	<0.58	<0.59	<0.56	<1.35	<1.35	<1.35
00799452	<1.58	<2.70	<2.05	<1.66	<1.67	<1.59	<3.84	<3.84	<3.84
00799453	<1.58	<2.71	<2.06	<1.66	<1.67	<1.59	<3.84	<3.84	<3.84
00799454	<1.58	<2.71	<2.06	<1.66	<1.68	<1.59	<3.85	<3.85	<3.85
00799455	<0.56	2.17	1.24	<0.59	<0.59	<0.56	3.88	<1.36	5.60
00799456	<0.90	2.31	2.80	<0.94	<0.95	<0.90	<2.18	<2.18	<2.18
00799457	<0.90	<1.54	<1.17	<0.94	<0.95	<0.90	<2.18	<2.18	<2.18
00799458	<1.59	12.3	8.94	<1.67	<1.69	<1.60	<3.87	164	<3.87
00799459	<0.56	<0.96	<0.73	<0.59	<0.59	<0.57	<1.37	<1.37	<1.37
00799460	<0.56	<0.96	<0.73	<0.59	<0.60	<0.57	<1.37	<1.37	<1.37
00799461	<0.56	<0.96	<0.73	<0.59	<0.60	<0.57	<1.37	<1.37	<1.37
00799462	<0.56	<0.97	<0.73	<0.59	<0.60	<0.57	<1.37	<1.37	<1.37
00799463	<1.60	<2.75	<2.08	<1.68	<1.70	<1.61	<3.90	<3.90	<3.90
00799464	<1.61	<2.75	<2.09	<1.69	<1.70	<1.62	<3.90	<3.90	<3.90
00799465	<1.61	<2.75	<2.09	<1.69	<1.70	<1.62	<3.91	<3.91	<3.91
00799466	<1.61	<2.75	<2.09	<1.69	<1.70	<1.62	<3.91	<3.91	<3.91
00799467	<1.61	<2.76	<2.09	<1.69	<1.70	<1.62	<3.91	<3.91	<3.91
00799468	<1.61	<2.76	<2.09	<1.69	<1.70	<1.62	<3.92	<3.92	<3.92
00799469	<1.61	<2.76	<2.09	<1.69	<1.71	<1.62	<3.92	<3.92	<3.92
00799470	<1.61	<2.76	<2.09	<1.69	<1.71	<1.62	<3.92	<3.92	<3.92
00799471	<1.61	<2.76	2.40	<1.69	<1.71	<1.62	<3.92	<3.92	<3.92
00799472	<1.62	<2.76	<2.10	<1.69	<1.71	<1.63	<3.92	<3.92	<3.92
00799473	<1.62	3.15	<2.10	<1.69	<1.71	<1.63	11.5	<3.93	<3.93
00799474	<0.91	<1.56	<1.18	<0.96	<0.96	<0.92	<2.22	30.4	<2.22
00800425	<0.91	<1.56	<1.18	<0.96	<0.97	<0.92	<2.22	<2.22	<2.22
00800426	<0.91	<1.56	<1.19	<0.96	<0.97	<0.92	<2.22	<2.22	<2.22
00800427	<0.91	<1.56	<1.19	<0.96	<0.97	<0.92	<2.22	<2.22	<2.22

AMPLIFIED GEOCHEMICAL IMAGING ANALYTICAL RESULTS
210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE
STANTEC CONSULTING, WEST CHESTER, PA
AGI TARGET COMPOUNDS
ESTIMATED SOIL-GAS CONCENTRATIONS
REFORMATE RELEASE INVESTIGATION
ORDER #02038

DATAFILE							estimated	estimated	estimated
NAME	1122TetCA, ug/m^3	135TMB, ug/m^3	124TMB, ug/m^3	13DCB, ug/m^3	14DCB, ug/m^3	12DCB, ug/m^3	UNDEC, ug/m^3	NAPH, ug/m^3	TRIDEC, ug/m^3
00800428	<0.92	<1.57	<1.19	<0.96	<0.97	<0.92	<2.22	<2.22	<2.22
00800429	<0.92	<1.57	<1.19	<0.96	<0.97	<0.92	<2.23	<2.23	<2.23
00800430	<0.92	<1.57	<1.19	<0.96	<0.97	<0.92	<2.23	<2.23	<2.23
00800431	<0.92	<1.57	<1.19	<0.96	<0.97	<0.92	<2.23	<2.23	<2.23
00800432	<0.92	<1.57	<1.19	<0.96	<0.97	<0.92	<2.23	<2.23	<2.23
00800433	<0.92	<1.57	<1.19	<0.96	<0.97	<0.92	<2.23	<2.23	<2.23
00800434	<0.92	<1.57	<1.19	<0.96	<0.97	<0.93	22.3	<2.24	<2.24
00800435	<0.92	<1.57	<1.19	<0.97	<0.97	<0.93	<2.24	<2.24	<2.24
00800436	<0.92	<1.57	<1.20	<0.97	<0.97	<0.93	<2.24	<2.24	<2.24
00800437	<1.08	<1.85	<1.40	<1.13	<1.14	<1.09	<2.63	<2.63	<2.63
00800439	<1.08	<1.85	<1.40	<1.13	<1.14	<1.09	<2.63	<2.63	<2.63
00800440	<1.08	<1.85	<1.40	<1.13	<1.14	<1.09	<2.63	<2.63	<2.63
00800441	<1.08	<1.85	<1.40	<1.13	<1.14	<1.09	<2.63	<2.63	<2.63
BLK-1	<1.06	<1.81	<1.37	<1.11	<1.12	<1.06	<2.57	<2.57	<2.57
BLK-2	<1.06	<1.81	<1.37	<1.11	<1.12	<1.06	<2.57	<2.57	<2.57

AMPLIFIED GEOCHEMICAL IMAGING ANALYTICAL RESULTS
210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE
STANTEC CONSULTING, WEST CHESTER, PA
AGI TARGET COMPOUNDS
ESTIMATED SOIL-GAS CONCENTRATIONS
REFORMATE RELEASE INVESTIGATION
ORDER #02038

DATAFILE	estimated	estimated	estimated	estimated	estimated
NAME	2MeNAPH, ug/m^3	Acenaphthylene, ug/m^3	PENTADEC, ug/m^3	Acenaphthene, ug/m^3	Fluorene, ug/m^3
Average RL=	2.57	2.57	2.57	2.57	2.57
00799439	<3.73	<3.73	<3.73	<3.73	<3.73
00799440	5.89	<3.75	4.75	<3.75	<3.75
00799441	<3.76	<3.76	<3.76	<3.76	<3.76
00799442	2.93	<2.12	<2.12	23.6	<2.12
00799443	<1.33	<1.33	<1.33	<1.33	<1.33
00799444	<3.77	<3.77	<3.77	<3.77	<3.77
00799445	<3.78	<3.78	<3.78	<3.78	<3.78
00799446	<3.79	<3.79	<3.79	<3.79	<3.79
00799447	<3.80	<3.80	<3.80	<3.80	<3.80
00799448	<1.34	<1.34	<1.34	<1.34	<1.34
00799449	<2.15	<2.15	<2.15	<2.15	<2.15
00799450	<2.15	<2.15	<2.15	<2.15	<2.15
00799451	<1.35	<1.35	<1.35	<1.35	<1.35
00799452	<3.84	<3.84	<3.84	<3.84	<3.84
00799453	<3.84	<3.84	<3.84	<3.84	<3.84
00799454	<3.85	<3.85	<3.85	<3.85	<3.85
00799455	1.36	<1.36	<1.36	<1.36	<1.36
00799456	<2.18	<2.18	<2.18	<2.18	<2.18
00799457	<2.18	<2.18	<2.18	<2.18	<2.18
00799458	30.7	<3.87	<3.87	36.4	16.4
00799459	<1.37	<1.37	<1.37	<1.37	<1.37
00799460	<1.37	<1.37	<1.37	<1.37	<1.37
00799461	<1.37	<1.37	<1.37	<1.37	<1.37
00799462	<1.37	<1.37	<1.37	<1.37	<1.37
00799463	<3.90	<3.90	<3.90	<3.90	<3.90
00799464	<3.90	<3.90	<3.90	<3.90	<3.90
00799465	<3.91	<3.91	<3.91	<3.91	<3.91
00799466	<3.91	<3.91	<3.91	<3.91	<3.91
00799467	<3.91	<3.91	<3.91	<3.91	<3.91
00799468	<3.92	<3.92	<3.92	<3.92	<3.92
00799469	<3.92	<3.92	<3.92	<3.92	<3.92
00799470	<3.92	<3.92	<3.92	<3.92	<3.92
00799471	<3.92	<3.92	<3.92	<3.92	<3.92
00799472	<3.92	<3.92	<3.92	<3.92	<3.92
00799473	<3.93	<3.93	<3.93	<3.93	<3.93
00799474	19.2	3.06	<2.22	21.3	11.5
00800425	<2.22	<2.22	<2.22	<2.22	<2.22
00800426	<2.22	<2.22	<2.22	<2.22	<2.22
00800427	<2.22	<2.22	<2.22	<2.22	<2.22

AMPLIFIED GEOCHEMICAL IMAGING ANALYTICAL RESULTS
210 EXECUTIVE DRIVE, SUITE 1, NEWARK, DE
STANTEC CONSULTING, WEST CHESTER, PA
AGI TARGET COMPOUNDS
ESTIMATED SOIL-GAS CONCENTRATIONS
REFORMATE RELEASE INVESTIGATION
ORDER #02038

DATAFILE	estimated	estimated	estimated	estimated	estimated
NAME	2MeNAPH, ug/m^3	Acenaphthylene, ug/m^3	PENTADEC, ug/m^3	Acenaphthene, ug/m^3	Fluorene, ug/m^3
00800428	<2.22	<2.22	<2.22	<2.22	<2.22
00800429	<2.23	<2.23	<2.23	<2.23	<2.23
00800430	<2.23	<2.23	<2.23	<2.23	<2.23
00800431	<2.23	<2.23	<2.23	<2.23	<2.23
00800432	<2.23	<2.23	<2.23	<2.23	<2.23
00800433	<2.23	<2.23	<2.23	<2.23	<2.23
00800434	<2.24	<2.24	<2.24	<2.24	<2.24
00800435	<2.24	<2.24	<2.24	<2.24	<2.24
00800436	<2.24	<2.24	<2.24	<2.24	<2.24
00800437	<2.63	<2.63	<2.63	<2.63	<2.63
00800439	<2.63	<2.63	<2.63	<2.63	<2.63
00800440	<2.63	<2.63	<2.63	<2.63	<2.63
00800441	<2.63	<2.63	<2.63	<2.63	<2.63
BLK-1	<2.57	<2.57	<2.57	<2.57	<2.57
BLK-2	<2.57	<2.57	<2.57	<2.57	<2.57

KEY TO DATA TABLE

UNITS

µg	micrograms, relative mass value
µg/m^3	micrograms per cubic meter; estimated soil gas concentration
µg/L	micrograms per Liter; calculated water concentration

DATA QUALIFIERS

>	greater than; value exceeds calibration range, estimated value
<	less than; compound value is below the LOD and RL
J	mass value below LOQ or RL, but above LOD, estimated mass value
E	mass value exceeds upper calibration level, estimated mass value
Q	one or more quality control parameters failed for the compound

ABBREVIATIONS

AVG RL	average reporting limit; calculated based on individual field sample RLs
LOD	limit of detection
LOQ	limit of quantification
MDL	method detection limit
RL	reporting limit

1112TetCA	1,1,1,2-tetrachloroethane
111TCA	1,1,1-trichloroethane
1122TetCA	1,1,2,2-tetrachloroethane
112TCA	1,1,2-trichloroethane
11DCA	1,1-dichloroethane
11DCE	1,1-dichloroethene
124TMB	1,2,4-trimethylbenzene
12DCA	1,2-dichloroethane
12DCB	1,2-dichlorobenzene
135TMB	1,3,5-trimethylbenzene
13DCB	1,3-dichlorobenzene
14DCB	1,4-dichlorobenzene
2MeNAPH	2-methyl naphthalene
BENZ	benzene
BTEX	combined masses of benzene, toluene, ethylbenzene, and total xylenes (Gasoline Range Aromatics)
C11,C13&C15	combined masses of undecane, tridecane, and pentadecane (C11+C13+C15) (Diesel Range Alkanes)
c12DCE	cis-1,2-dichloroethene
CCl4	carbon tetrachloride
CHC13	chloroform
ClBENZ	chlorobenzene
ct12DCE	cis- & trans-1,2-dichloroethene
EtBENZ	ethylbenzene
mpXYL	m-, p-xylene
MTBE	methyl t-butyl ether
NAPH	naphthalene
OCT	octane
oXYL	o-xylene
PCE	tetrachloroethene
PENTADEC	pentadecane
PHEN	phenanthrene
t12DCE	trans-1,2-dichloroethene
TCE	trichloroethene
TMBs	combined masses of 1,3,5-trimethylbenzene and 1,2,4-trimethylbenzene
TOL	toluene
TPH	total petroleum hydrocarbons
TRIDEC	tridecane
UNDEC	undecane
VC	vinyl chloride

SUMMARY OF SAMPLING RATE CALIBRATION FOR AGI SPG-0008 SAMPLER IN A GAS PHASE

PURPOSE:

The purpose of this document is to:

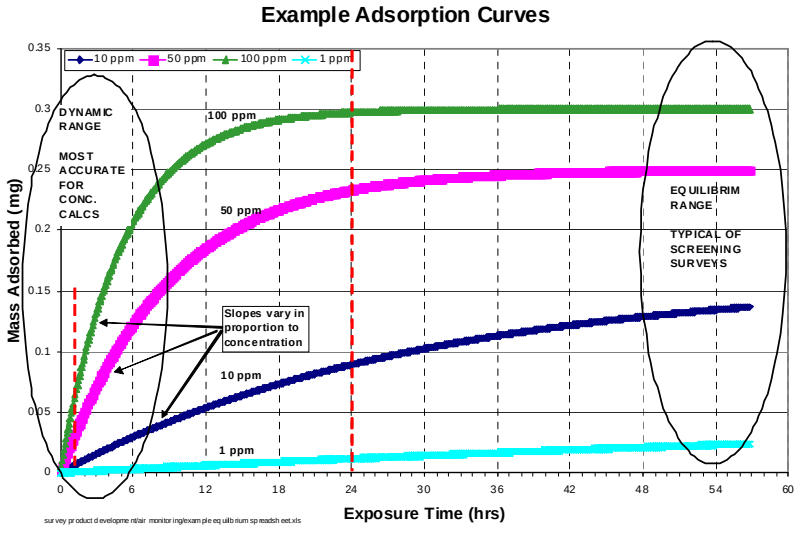
1. Summarize the test protocol,
2. Summarize the methodology for analysis of data,
3. Present general results for generating concentration calibration

of the AGI Sampler, SPG-0008, in a gas phase (air or soil gas) following AGI's "Standard practice for determining the sampling rate of passive diffusion samplers in various environmental media," SPG-SOP-0493. The work will be summarized in two parts: Part 1: air, Part 2: soil gas.

Principle of Operation of the AGI Sampler

The AGI Sampler is designed with solid adsorbents enclosed inside a tubular microporous PTFE membrane. When placed in soil or saturated soil, the pores and hydrophobic nature of the PTFE keep liquid water from entering the membrane. The membrane will not keep water vapor from entering but the adsorbents are very hydrophobic and testing of the SPG-0008 sampler has validated it to be unaffected by this moisture vapor. Compounds in air with vapor pressures above about 1 millionth of a mm of Hg will diffuse through the microporous membrane and be immediately captured on the solid adsorbent housed inside. The membrane porosity and dimensions are well controlled as is the mass of the adsorbent contained inside the sampler. The average pore diameter of the membrane is 1000 times larger that of the compounds of interest, meaning the membrane offers a minimal resistance. On the other hand, the membrane pore size is small enough that colloidal particles and microbes can not pass through the membrane. This keeps the adsorbent from getting contaminated and eliminates any need to add preservative or chill during storage or transportation.

When a sampler is exposed to compounds in air, mass from the volatile compound are collected on the solid adsorbent inside the microporous PTFE membrane. To the right is a generalized example of mass uptake with time for this sampler.



Notice the initial slope and ultimate equilibrium mass both increase with increasing concentrations. For shorter time the increase is virtually

linear but as the mass increases toward the steady state, mass uptake slows and mass eventually reaches an asymptote. The initial range is referred to as the dynamic linear range while the later stage is referred to as the equilibrium range.

The sampling rate calibration for this passive sampler will apply to the linear and near-linear dynamic range, where accuracy and precision are best.

Temperature can affect both the diffusivity in air, which is part of the sampling rate but also the binding energy of the compound to the adsorbent. In general passive sampling devices are not highly affected by temperature although the effect will be more important for lower MW compounds. It is not uncommon to have an Arrhenius factor, -Ea/R of <1000, which means a 5°C temperature change will make less than a 5% change in sampling rate.

In soil, the matrix of particles and water creates a resistance to soil gas diffusion. Millington (Millington 1959) has modeled this resistance and developed a model to correct the diffusion for this added resistance based upon the porosity of the soil and the fraction of pores filled with water. This "Soil Effectiveness Factor" can lower the sampling rate in soil to 40% to 10% of that in free air. This will discussed further in Part 2.

PART 1: Calibration in Air

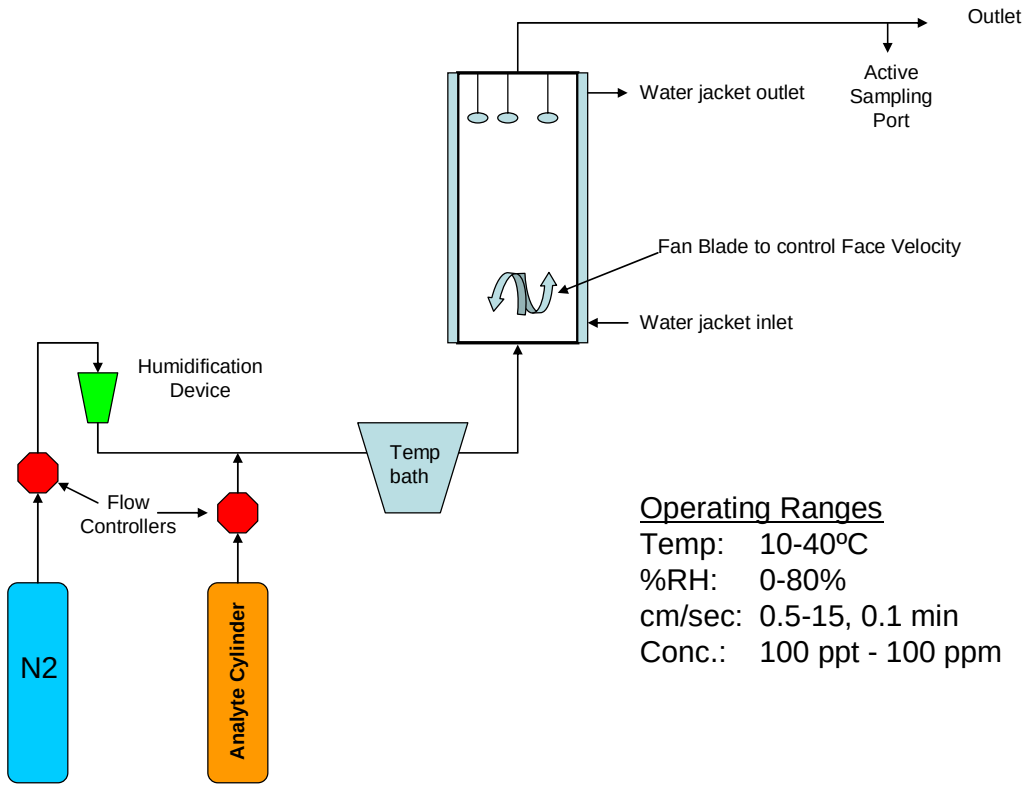
Part 1 summarizes the work in free air generating calibration data, evaluating the physical and chemical factors affecting the sampling rate, and measurement of the actual sampling rates or regression calibration equations needed to determine concentrations.

Sample Generation in Air

In this calibration work, gaseous mixtures of analytes at known concentrations were generated inside a 3 liter glass vessel by mixing flow from gaseous standard cylinders with nitrogen using electronic flow controllers. A diagram of the set up is shown below. Total flow through the vessel ranged from 2 to 50 liters/min with an aim, where possible, of using a flow 20 or more times the combined sampling rate of AGI® Sampler being tested.

This gas mixture was temperature controlled by running it through a coil in a temperature controlled chiller. Similarly, the glass vessel was also temperature controlled by circulating the chiller fluid through the vessel jacket. A mercury thermometer in the vessel was used to determine the experiment temperature. The humidity level of the mixed gas was modified by passing the nitrogen portion of the gas mixture through a bubbler. Different humidity levels could be achieved by using water or saturated salt solutions in the bubbler that generate different relative humidities.

Passive Diffusion Sampling Rate Measurement Apparatus



Internal wind velocity was controlled using a propeller blade attached to a shaft and motor. RPM was measured to calculate air velocity based on propeller pitch and rpm.

Before each experiment, the system was run for minutes to hours to allow temperature, humidity, and compound density on the vessel walls to stabilize. When changing concentrations, a stabilization time, typically, 2-10 hours, was provided to allow the vessel walls to reach a new equilibrium with the analyte concentrations and wall temperature.

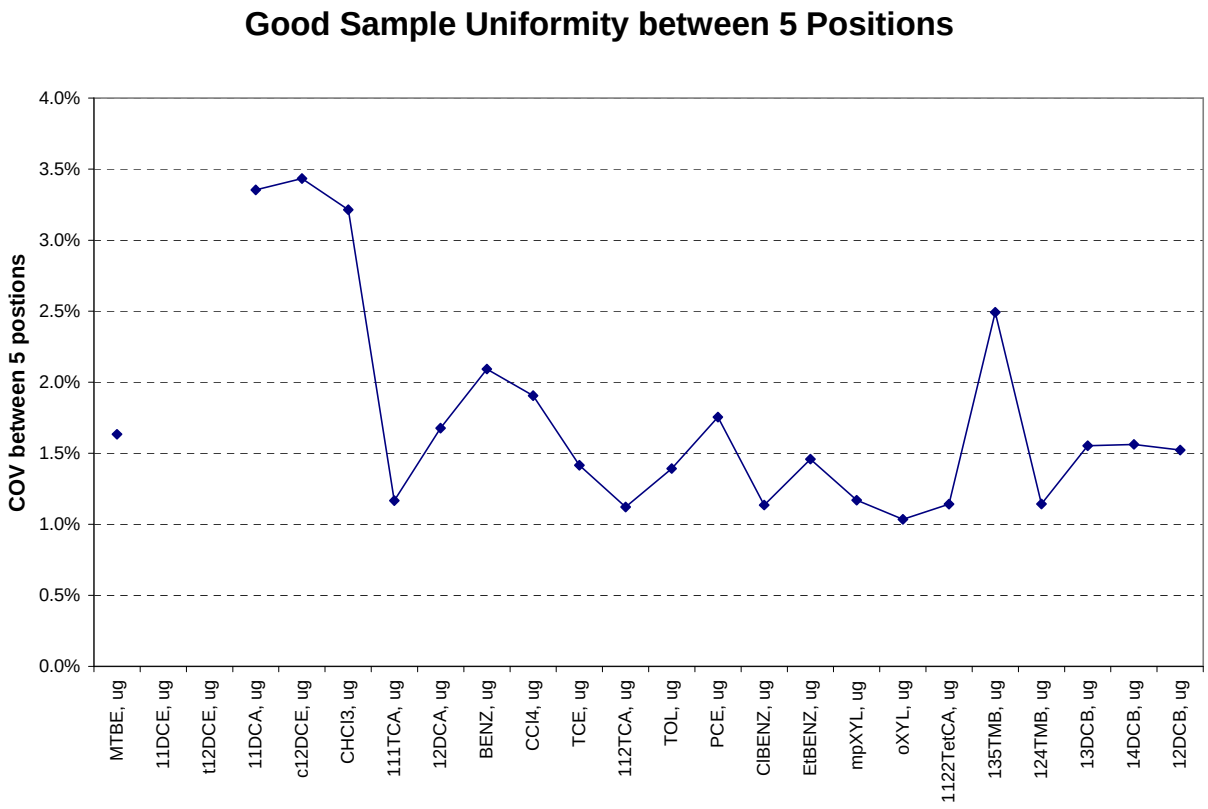
AGI sampler were hung inside the vessel at time zero. They were removed at various intervals to generate samples along with duplicates that showed mass increasing with exposure time. The sampler exposure time was selected to span minutes to hours and was generally reduced for high concentration tests to maintain uptake with time, in roughly the linear dynamic range. Sampler were removed and placed back into their original jars for analysis. They were analyzed by AGI's 8260C method (SPG-WI-0318 or SPG-WI-10028) in duplicate, which is based on EPA SW846 Method 8260C.

Vessel concentration was also measured during the tests using a TO-17 type of method. A MSA pump pulled about 1.5 L/hr of atmosphere from the chamber through two thermal desorption tubes in series, the first packed with Tenax-TA, and the second packed with a strong adsorbent carbon molecular sieve. Flow rate through the series of tubes was measured at the start and end of the pumping. Analysis of the thermal desorption tubes were performed by appropriate

analytical methods. Each Tenax-TA tube was analyzed by AGI's 8260C method (SPG-WI-0319 or SPG-WI-10028) and each carbonaceous tube by AGI's screening method (SPG-WI-0292). Typically only a small portion of the lower molecular weight compounds, such as DCA & DCE passed through the Tenax-TA tube to be captured on the carbon tube. Concentration was determined by

(sum of mass on both tubes)/(avg flow rate x hours) = ug/L

Up to five sampler can be placed simultaneously in the chamber. Testing confirmed good sample uniformity among the locations as shown by coefficients of variation generally below 3% in the chart below.



Most of the runs were performed using a TO-15 mix of compounds in a cylinder made up at nominally 1 ppm. Using nitrogen dilution, sampling rate measurements were done at concentrations from about 1 ppb to 50 ppb. Higher concentration cylinders can be used to generate concentrations in the ppm range if desired.

Sampling rate calibrations were run using multiple concentrations, typically 5-50 ppb and temperatures, typically 5°C to 35°C. Samples were run in duplicate. A total of 94 data points were generated using 23 compounds from AGI's standard compounds list. In addition, another 23 compounds were tested from those in the TO-15 mix. This is a living calibration and as additional data are generated, they may be qualified and added to this data set to improve the precision of the sampling rate calibration and broaden the compound list.

Key Variable Effects

Based on theory, at short to moderate exposure times mass will increase roughly linearly proportional to exposure time, as well as, proportional to concentration. For passive samplers in air, temperature generally does not have a major effect on sampling rate. Even so, this work examined the impact of temperature because it could have a small effect on diffusivity in air and potentially adsorption strength for low MW compounds.

Except in indoor environments, air velocity is expected to be low and of inconsequential importance. The passive adsorbent is protected by wind stopping AGI membrane. Even so, we looked at velocity effects. Based on the hydrophobic nature of the adsorbents in SPG-0008 sampler, humidity is not expected to impact sampling rate.

Sampling rate has been found to be generally independent of concentration and time at mass values significantly below saturation. In the following sections we have characterized the sampling rate for each compound as affected by temperature and also developed calibrations using regression which account for the minor impact of time, and mass.

Concentration using Simple Sampling Rate Determination

A simple way to determine concentration is to measure mass on the AGI sampler, divide by exposure time, and divide by sampling rate, SR.

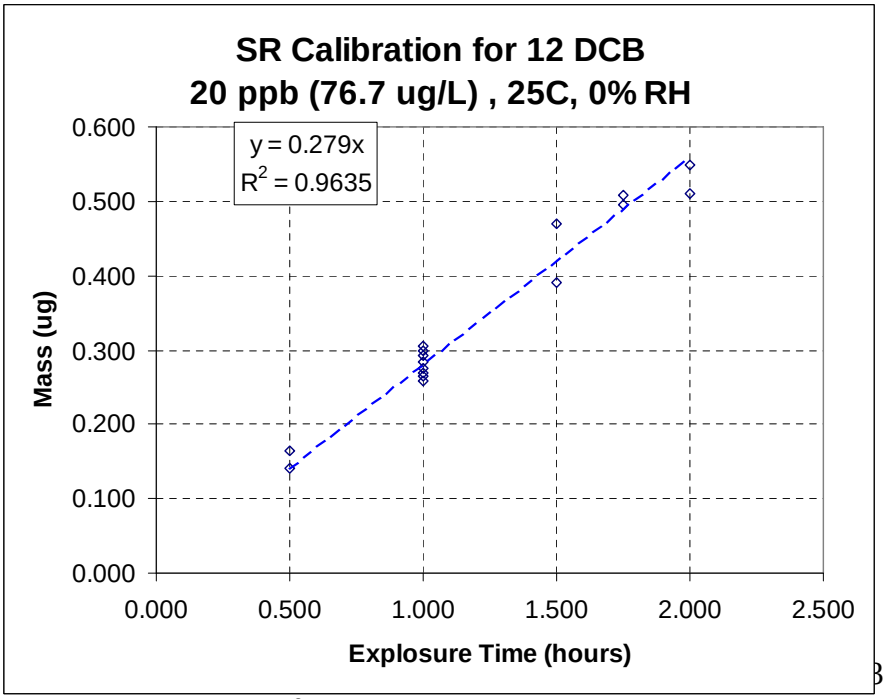
Conc [ug/L] = mass/time/SR (1)

The sampling rate can be determined via measurements of mass versus time at a known concentration and temperature according to the following modification of equation (1).

SR = mass/time/concentration (2)

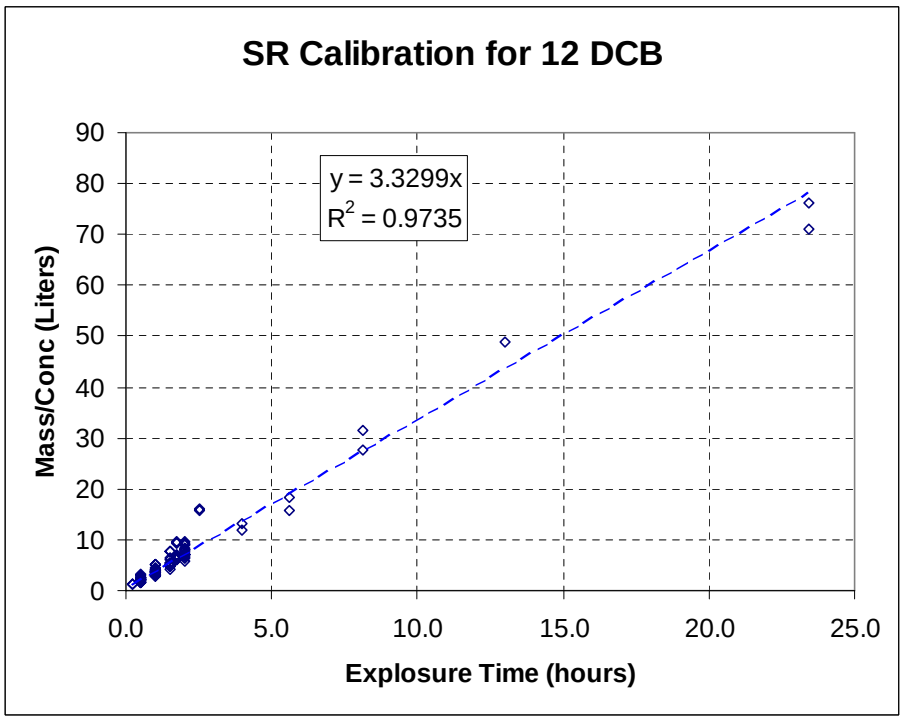
Sampling rates in L/hr were determined by measuring the trend or regression mass uptake versus time and dividing by the concentration. Such a sampling rate can be measured at any concentration and temperature.

The chart to the right shows a plot of mass versus time at 12DCB in nitrogen at nominally 20 ppb or 76.7 ug/cu m and



297K. This is actual data for one test run. The slope of 0.279 ug/hr divided by the concentration of 0.0767 ug/L yields a sampling rate, SR, of 3.64 L/hr.

The data could also be plotted as mass/Conc vs. time in which case the slope is the sampling rate directly as shown in the chart below. This allows the use of a larger data set incorporating multiple concentration tests.



Rigorous Concentration using Regression

A preferred method for determining concentration that will yield improved accuracy over a wide range of concentrations, exposure times, and temperatures is to use all data in a regression analysis. This allows adjustments for the minor non-linear influences of mass and time as well as the effects of temperature. This is done by regressing equation (1) or a universal version of equation (1)

$$Conc = (mass)^{b} / (time)^{-d} / [SRo*exp(-Ea/R/T)] \quad (3)$$

The subtle non-linear effects of mass and time will be evident in the deviation of coefficients b and d from 1.0. This regression generates four constants b, d, SRo, and –Ea/R by regressing ln(conc) versus ln(mass), ln(time), 1/temp. These four constants can be used to determine concentration via the equation:

$$Conc = (mass)^{b} / (time)^{-d} / [SRo \times exp(-Ea/R(1/T))] \quad (4)$$

Where conc is in ug/L, mass is in ug, time in hours, T in degrees Kelvin.

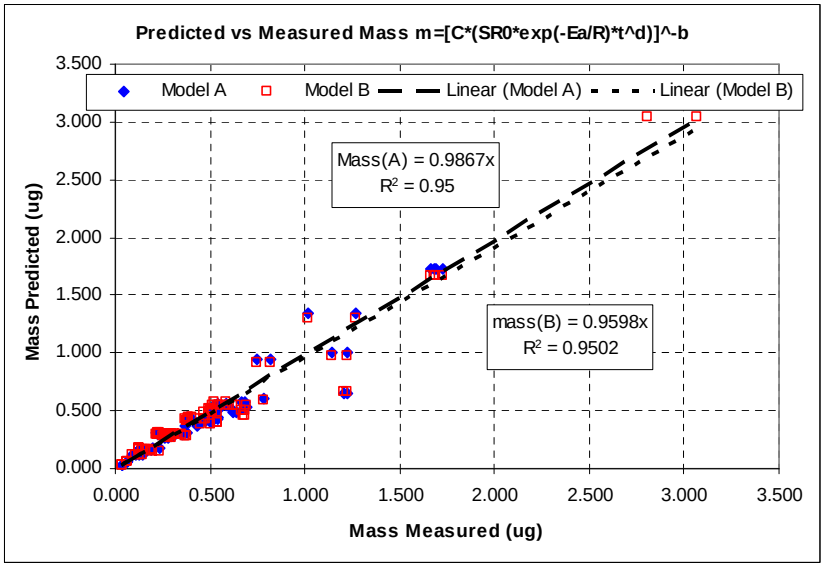
Equation (4) can also be expressed at a reference temperature, Tr, such as 15°C by

$$Conc = (mass)^{b} / (time)^{-d} / [SRr \times \exp(-Ea/R(1/Tr-1/T))] \quad (5)$$

This allows sampling rates, SRr, at any reference temperature, Tr, and for any analyte to easily be compared. These values of SRr at 25°C 298.14°K can be found in Table A.

The chart to the right is a plot of the 12DCB predicted mass from the 4 constant regression compared to the measured mass. Agreement is excellent for the 95 data points.

Model A or the blue points are the 4 constant model, while Model B or the red squares are a 3 constant model ignoring temperature. Error for 12DCB is slightly lower for Model A and for lower MW compounds it is much better.



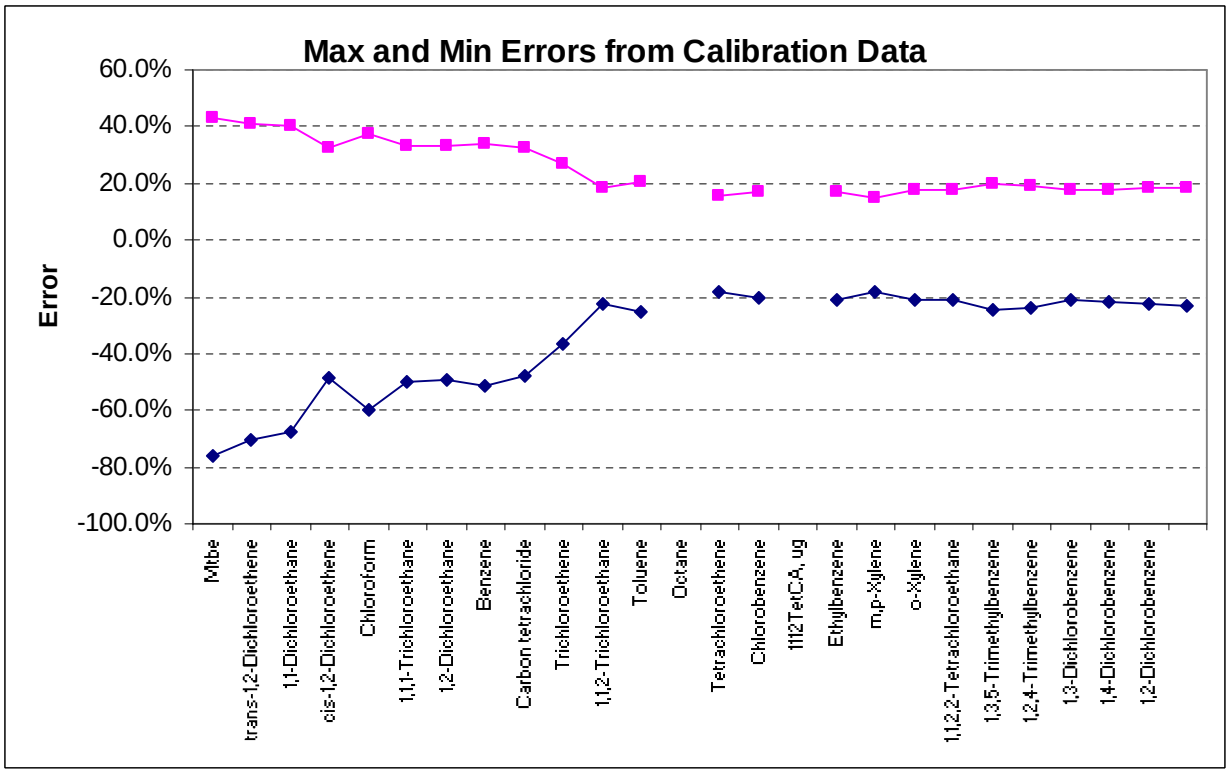
The 4 constant equation has been adopted for determining concentration in the gas phase.

Table B shows the tabulated summary of the 4 constants regression with Rsq values and error estimates for the 4 constants for each analyte. With the exception of MTBE and t12DCE the regression Rsq values are 0.9 or greater for each analyte. In general, temperature is more important for early eluting compounds where -Ea/R ranges from 2000 to 4000 while later eluting compounds (112TCA and above) are in the range of 500 to 1000 meaning they are less affected by temperature. Similarly, early eluting compounds have mass and time coefficients, b and d respectively, that deviate from 1.0.

Error Estimates

Table C shows the error in the mass values from the 8260C low sensitivity method (SPG-WI-318), which at a 95% confidence level is typically 10% - 15%. The error between the primary sample and the duplicate in the sampler is generally about 5% and shown in table D.

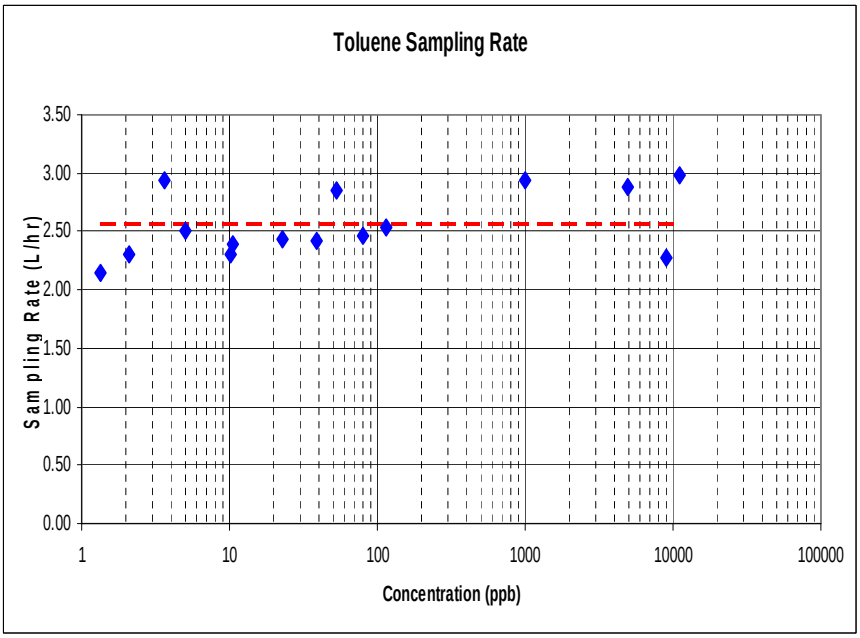
The standard error of the regression and standard errors of the constants can be found in table B. For each compound we have measured the error between the derived concentration and the actual concentration. This is tabulated in table D and shown below by compounds.



The maximum total error range is +/-20% for 112TCA and later eluting compounds. The maximum error range increases for compounds that elute earlier than 112TCA.

Effect of Concentration

The measurement of sampling rate, SR, is effectively independent of concentration. The chart below shows statistically consistent sampling rate over four decades of concentration change for toluene. This has also been observed for other tested compounds.



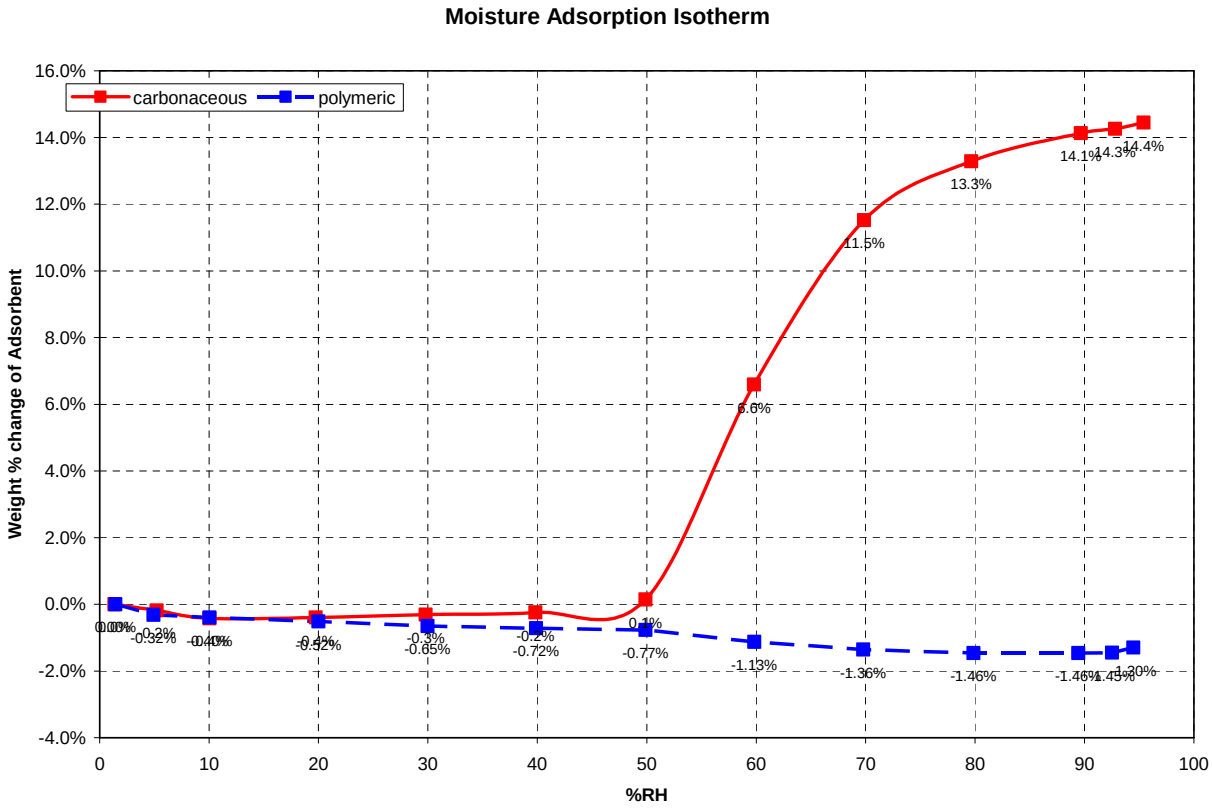
Sorbent Saturation

As mass increases on a solid sorbent and approaches saturation, reverse diffusion can occur causing the sampling rate to drop. Eventually the mass level will reach a maximum steady state value at any concentration. A rate of mass uptake with time that deviates significantly from linear, indicates that sorbent saturation could be an issue. When using equation (1), staying in the linear range to avoid the effects of adsorbent saturation is important. We recommend keeping the total mass on the sampler below 50 ug or flagging when this is exceeded.

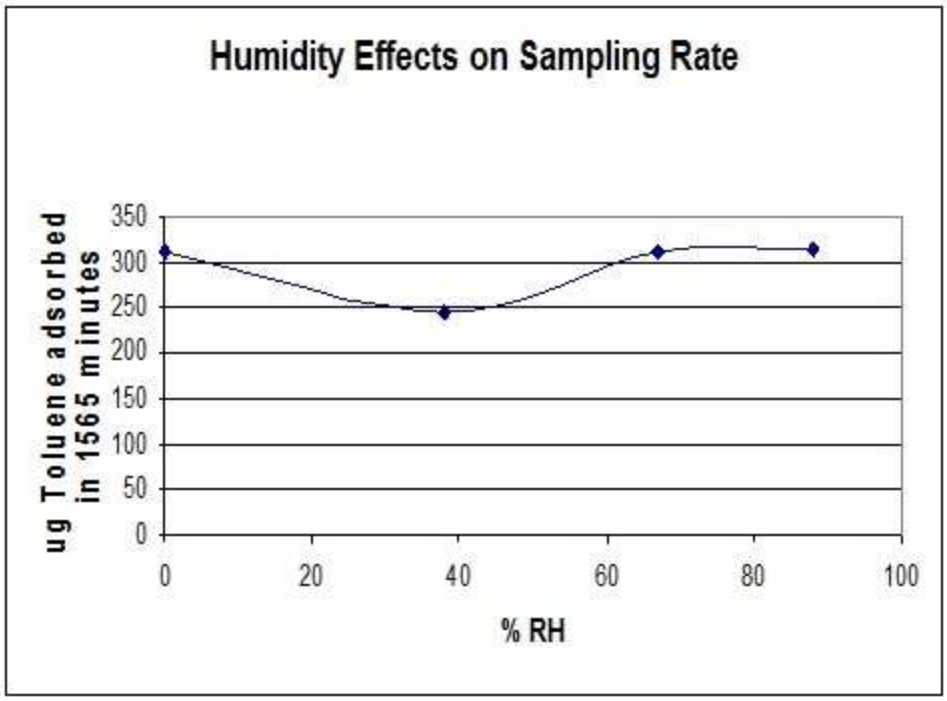
The 4 constant regression accounts for some of the non linearity allowing good accuracy at higher mass levels. From the experimental data we have found this safe range can be extended potentially up to 100 ug.

Effect of Relative Humidity

The adsorbent system used in the SPG-0008 sampler is a proprietary multi-polymer system. It was tested compared to a carbon adsorbent in a RH chamber for weight gain and found to be effectively unaffected by moisture.



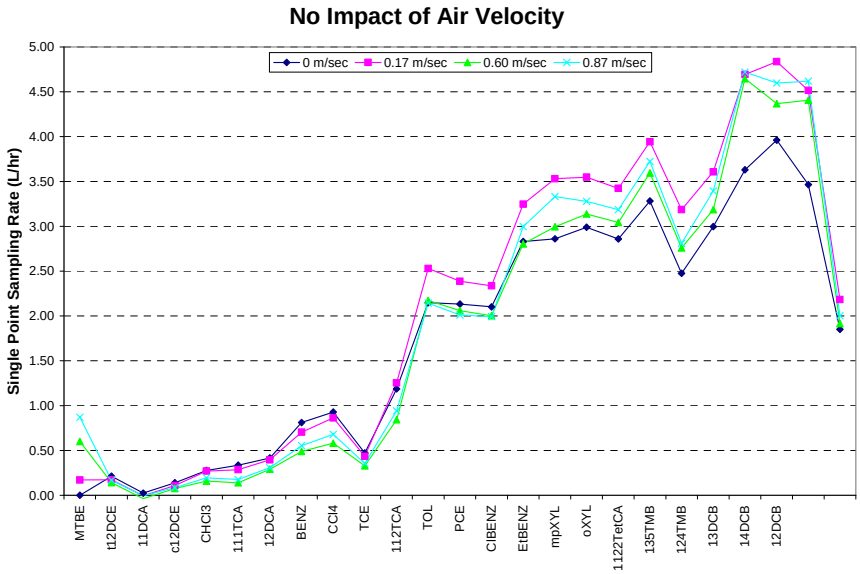
Additionally, mass adsorption was relatively constant at relative humidity ranging from 0% to 95%.



Impact of Air Velocity

To examine the potential impact of air velocity on sampling rate, five samplers were exposed for varying times up to 2 hours at 20 ppb of TO-15 mixture.

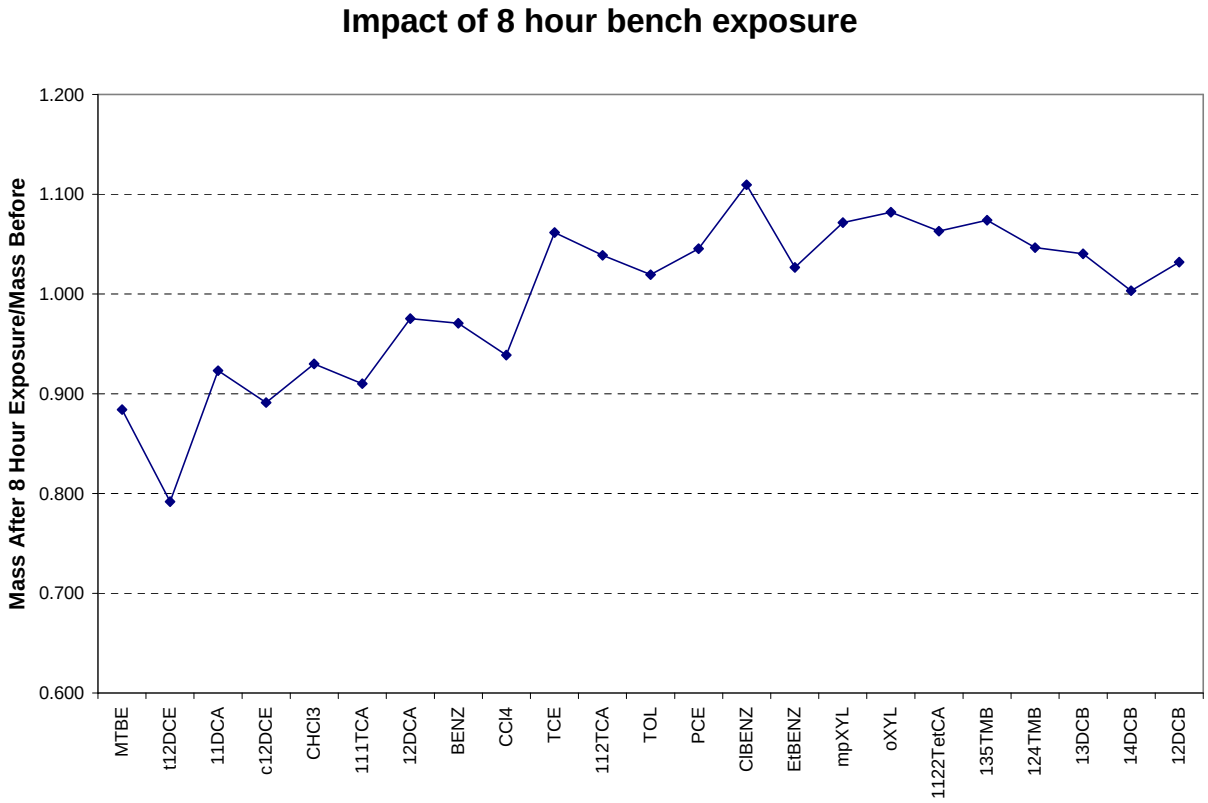
The chart to the right shows the calculated sampling rates from zero to 0.87 m/sec velocity. There is no structured impact of velocity on sampling rate.



Impact of Open Sampler Jar

Typically returning the exposed sampler to its jar and tightening the lid will maintain the mass. A test was run to look at the unexpected consequence of leaving the sampler in fresh air for 7.5 hours after exposure to 20 ppm of TO-15 mixture for 1 hour. Three sampler were tested without ambient air exposure and two with exposure and their mass levels measured. The chart below shows most compounds masses after the 7.5 hour exposure to fresh air are within 10%. One compound, t12DCE, is more affected losing 20% in this time.

Ambient air exposure post sampling would typically be expected to be < 5 minutes, so based on this we do not expect this will cause significant errors in reported mass or concentration. Care should be taken not to pinch the sampler between the jar and lid, which could allow contamination into the sample or loss of lower molecular weight compounds.



Part 2: Calibration in Soil

Part 2 describes the effect of soil on the sampling rate and concentration measurement.

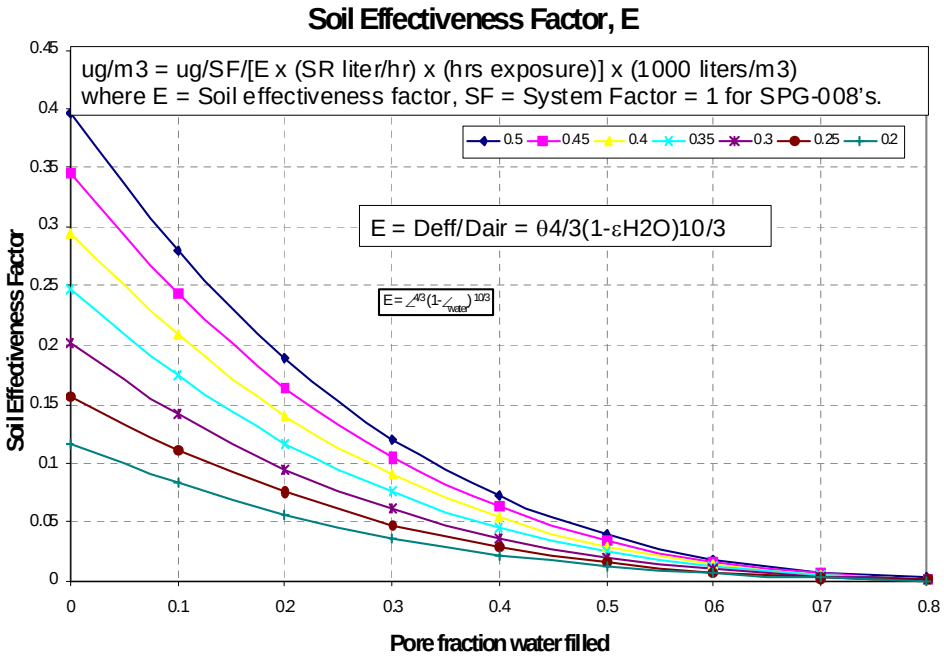
In a porous media, such as soil, diffusion of the analyte in the soil gas to the sampler is restricted. More porous soils have less restriction. This restriction has been experimentally modeled by Millington (Millington, R, J., "Gas Diffusion in Porous Media", Science, (1959), Vol. 130, 100-102) and found to be represented by the equation below:

$$SR_{soil} = E(SR_{air}) \quad (6)$$

where E is the "Soil Effectiveness Factor" expressed a function of total soil porosity (θ) and water filled porosity (ε, volume of water/volume of pores) as:

$$E = \theta^{(4/3)}(1-\varepsilon)^{(10/3)} \quad (7)$$

The chart to the right shows how E varies with soil porosity and fraction of pores filled with water.



Summary

The AGI Sampler can be used to determine the concentration of volatile and semi-volatile compounds in a gas phase. This requires knowing the exposure time and temperature and if in soil also requires values or estimates for soil porosity and the fraction of pores filled with water. Regressions of large amounts of data were used to generate a four constant equation to generate concentration values in air. Potential error in the concentration values is excellent typically less than 20% when used in gas phase sampling within the following conditions:

Condition	**Acceptable Range**
Temperature	0°C to 35°C
Velocity	0 to 0.9 m/sec
Relative Humidity	0 – 95%
Mass Level	0.01 – 50 ug

TABLE A
AIR SAMPLING RATES STANDARD LIST

	SR @ 298.94
MTBE	1.10
t12DCE	1.08
11DCA	0.96
c12DCE	1.51
CHCl3	1.18
111TCA	0.75
12DCA	1.87
BENZ	1.91
CCl4	0.93
TCE	1.83
112TCA	2.40
TOL	2.54
OCT	
PCE	2.33
ClBENZ	3.05
1112TetCA	
EtBENZ	3.02
mpXYL	3.02
oXYL	3.10
1122TetCA	3.35
135TMB	3.19
124TMB	3.35
13DCB	3.97
14DCB	4.09
12DCB	3.93
Total mass	1.80

Values in L/hr, Total mass does not include Oct, 1112TetCA (23 compounds)

TABLE B

4 CONSTANT REGRESSION OUTPUT

	Adjusted Rsq	Standard Error	ln(SR0)	b	-Ea/R	d	Std Error ln(SR0)	Std Error b	Std Error -Ea/R	Std Error d
MTBE	0.77	0.2684	6.1531	0.7137	-1862	-0.2973	1.1215	0.0421	309	0.0346
t12DCE	0.80	0.2498	14.2118	0.6315	-4261	-0.1411	1.2463	0.0358	343	0.0323
11DCA	0.91	0.2016	13.7734	0.8038	-4094	-0.2544	0.8973	0.0294	251	0.0258
c12DCE	0.89	0.2092	9.4567	0.7241	-2941	-0.2710	0.8774	0.0286	248	0.0267
CHCl3	0.91	0.2048	12.2405	0.8364	-3699	-0.3365	0.8737	0.0294	246	0.0261
111TCA	0.94	0.1701	8.3160	0.9176	-2393	-0.5136	0.6652	0.0257	189	0.0222
12DCA	0.92	0.1921	9.0559	0.8093	-2886	-0.4404	0.7728	0.0275	220	0.0248
BENZ	0.89	0.2178	7.6871	0.7990	-2485	-0.4583	0.8687	0.0326	247	0.0286
CCl4	0.91	0.2219	7.0239	0.8972	-2071	-0.5182	0.8597	0.0324	246	0.0289
TCE	0.94	0.1680	7.0333	0.8809	-2276	-0.5871	0.6541	0.0244	188	0.0224
112TCA	0.97	0.1401	3.0297	0.9933	-1165	-0.8405	0.5251	0.0205	153	0.0202
TOL	0.96	0.1468	2.9135	0.9448	-1147	-0.7896	0.5506	0.0220	160	0.0213
OCT										
PCE	0.97	0.1229	2.2557	0.9912	-925	-0.8337	0.4611	0.0183	134	0.0178
ClBENZ	0.97	0.1410	1.2078	0.9832	-693	-0.8819	0.5267	0.0210	153	0.0211
1112TetCA										
EtBENZ	0.96	0.1521	0.4685	0.9696	-469	-0.9107	0.5663	0.0226	165	0.0231
mpXYL	0.96	0.1505	0.7733	0.9883	-560	-0.9123	0.5594	0.0227	163	0.0229
oXYL	0.96	0.1554	0.5660	0.9495	-506	-0.8713	0.5776	0.0233	169	0.0234
1122TetCA	0.95	0.1715	0.5319	0.9793	-519	-0.9313	0.6375	0.0252	186	0.0262
135TMB	0.94	0.1783	1.1480	0.9370	-688	-0.8545	0.6646	0.0266	194	0.0266
124TMB	0.95	0.1702	1.4973	0.9590	-807	-0.8819	0.6368	0.0255	185	0.0257
13DCB	0.95	0.1641	0.9194	0.9644	-685	-0.8908	0.6115	0.0245	178	0.0250
14DCB	0.95	0.1619	1.4086	0.9556	-840	-0.8854	0.6030	0.0242	176	0.0246
12DCB	0.95	0.1713	0.9920	0.9620	-704	-0.9037	0.6388	0.0254	186	0.0261
Total mass	0.966	0.1302	3.4894	0.9213	-1215	-0.7716	0.4835	0.0195	142	0.0190

TABLE C
8260C MASS UNCERTAINTY

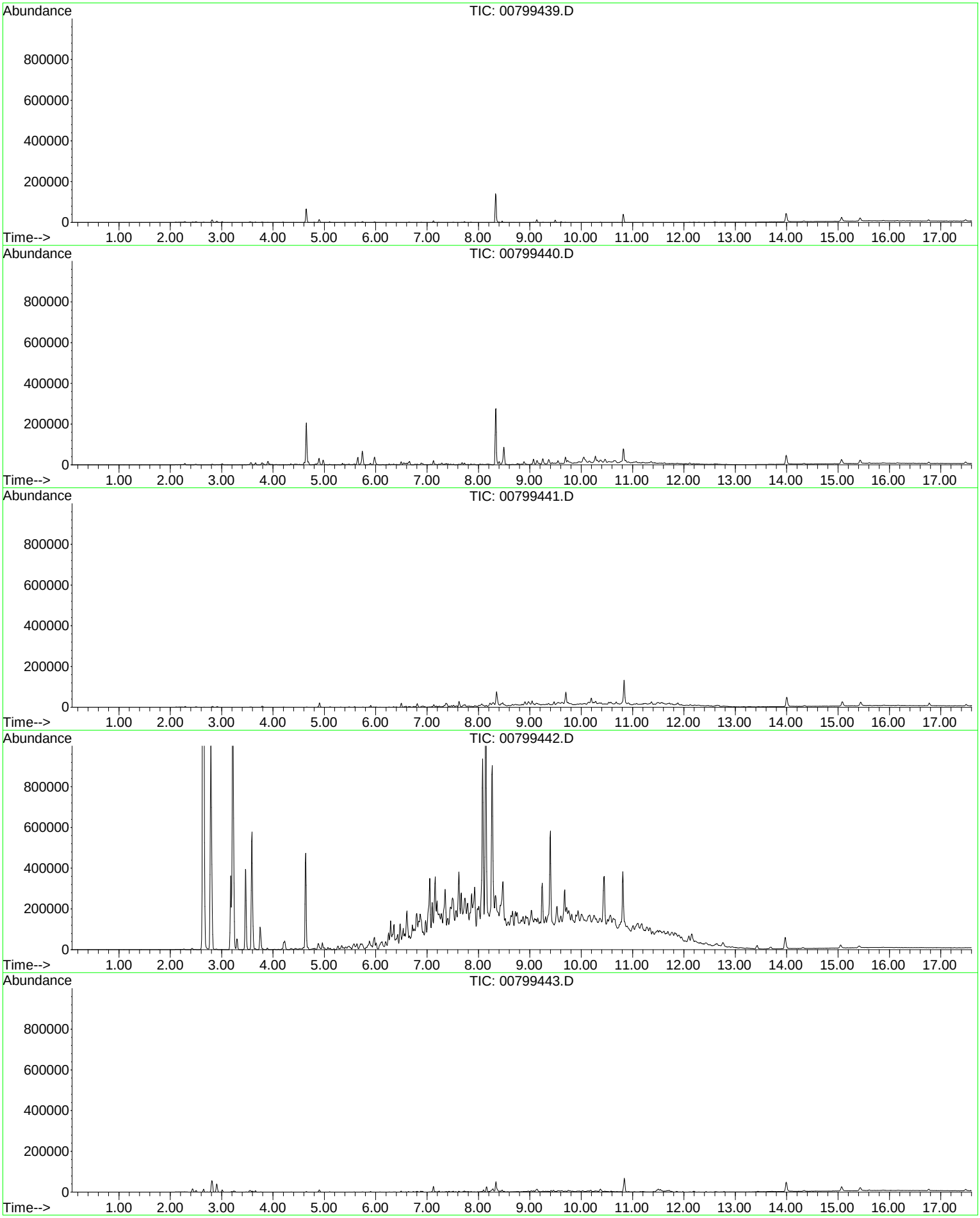
AGI 8260C Method for Mass using SPG-0008 Sampler

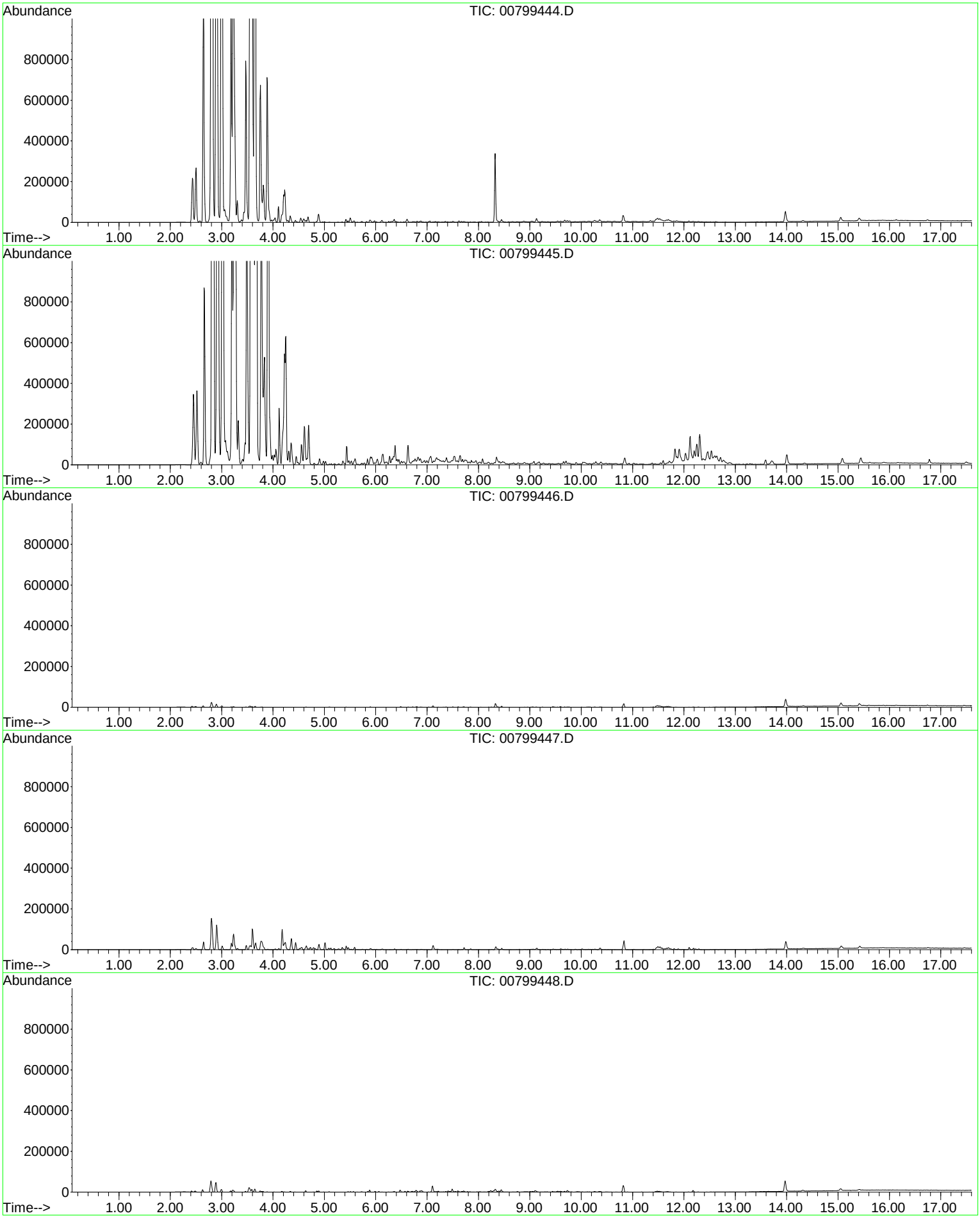
	99% Uncertainty Range +/-	95% Uncertainty Range +/-
MTBE	20%	14%
t12DCE	22%	15%
11DCA	18%	12%
c12DCE	18%	12%
CHCl3	16%	11%
111TCA	18%	12%
12DCA	20%	13%
BENZ	16%	10%
CCl4	19%	12%
TCE	15%	10%
112TCA	18%	12%
TOL	15%	10%
OCT	20%	13%
PCE	16%	11%
ClBENZ	18%	12%
1112TetCA	19%	13%
EtBENZ	18%	12%
mpXYL	18%	12%
oXYL	18%	12%
1122TetCA	23%	15%
135TMB	21%	14%
124TMB	20%	14%
13DCB	19%	13%
14DCB	19%	13%
12DCB	20%	14%
NAPH	21%	14%
2MeNAPH	25%	17%

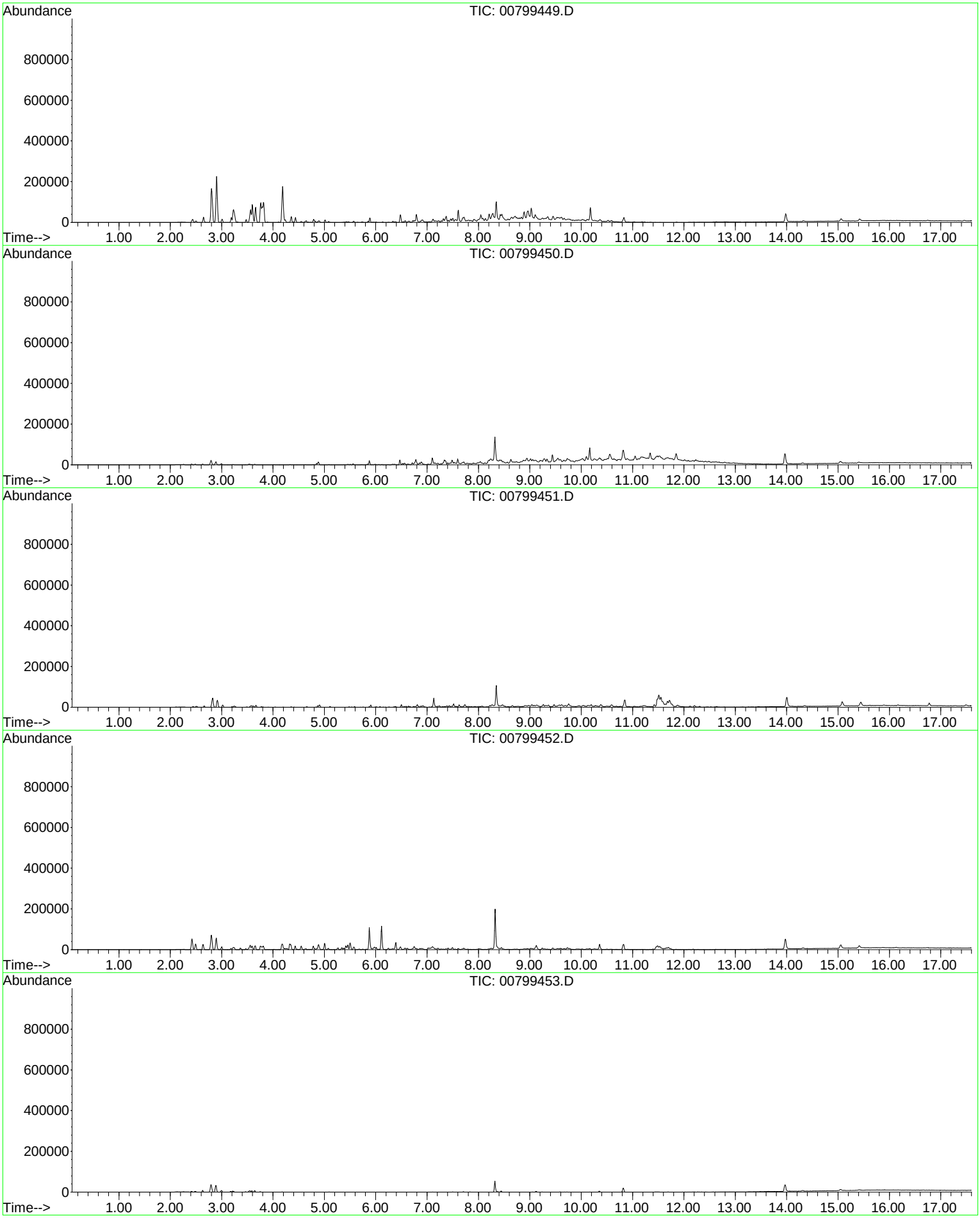
TABLE D
4 CONSTANT AIR CONCENTRATION UNCERTAINTY

ERROR IN CONCENTRATION REPORTING (1)

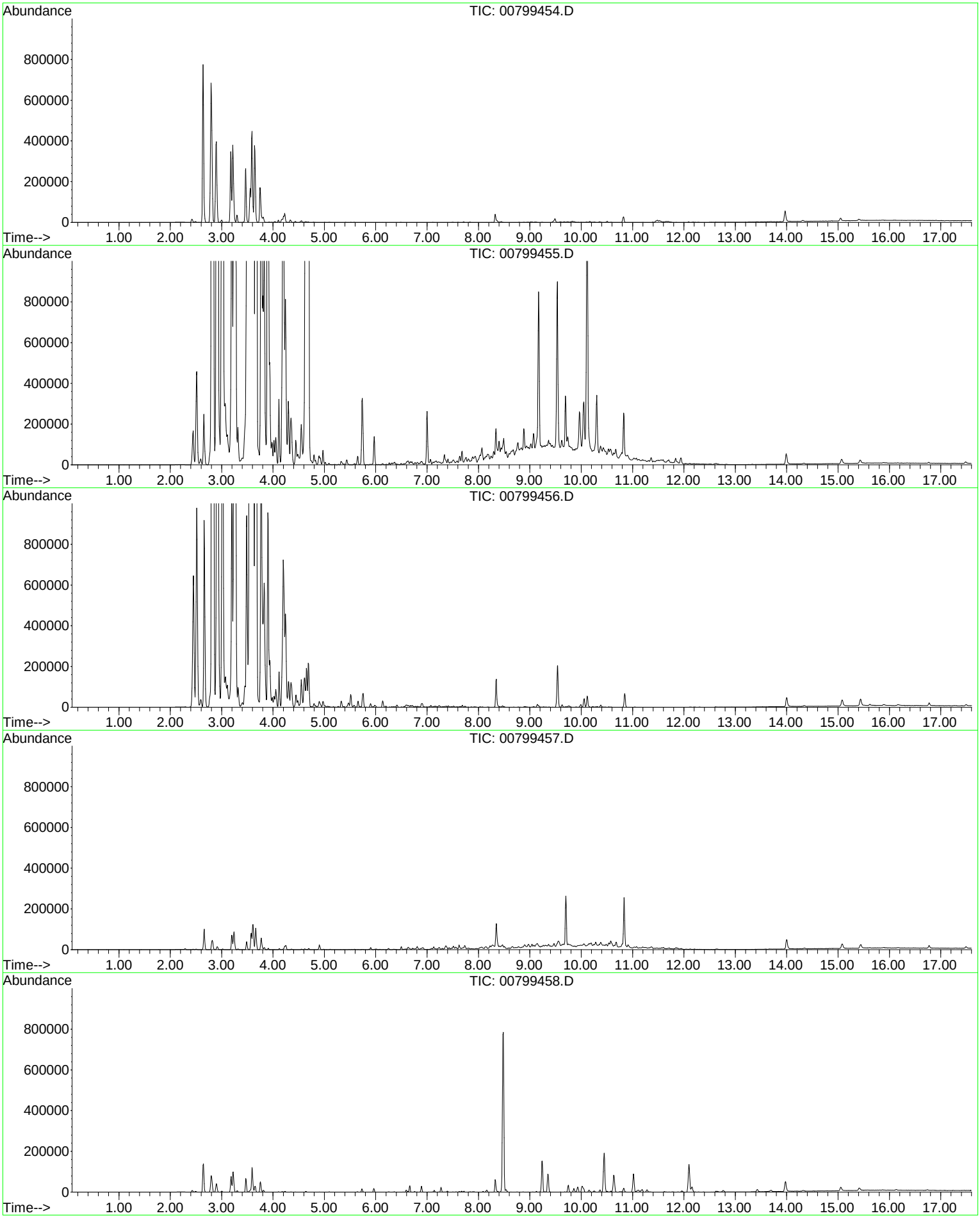
	Primary-Duplicate Error	Minimum Error	Maximum Error
MTBE	4.3%	-76%	43%
t12DCE	10.4%	-70%	41%
11DCA	5.2%	-68%	40%
c12DCE	6.0%	-49%	33%
CHCl3	4.8%	-60%	37%
111TCA	5.4%	-50%	33%
12DCA	5.4%	-49%	33%
BENZ	4.4%	-52%	34%
CCl4	5.3%	-48%	32%
TCE	5.7%	-37%	27%
112TCA	5.9%	-23%	18%
TOL	5.3%	-26%	20%
OCT			
PCE	5.7%	-18%	15%
ClBENZ	3.9%	-20%	17%
1112TetCA			
EtBENZ	5.1%	-21%	17%
mpXYL	4.5%	-18%	15%
oXYL	4.7%	-21%	17%
1122TetCA	5.2%	-21%	18%
135TMB	8.0%	-25%	20%
124TMB	7.0%	-24%	19%
13DCB	6.7%	-21%	18%
14DCB	6.1%	-22%	18%
12DCB	7.4%	-22%	18%
Total Mass	4.3%	-23%	18%

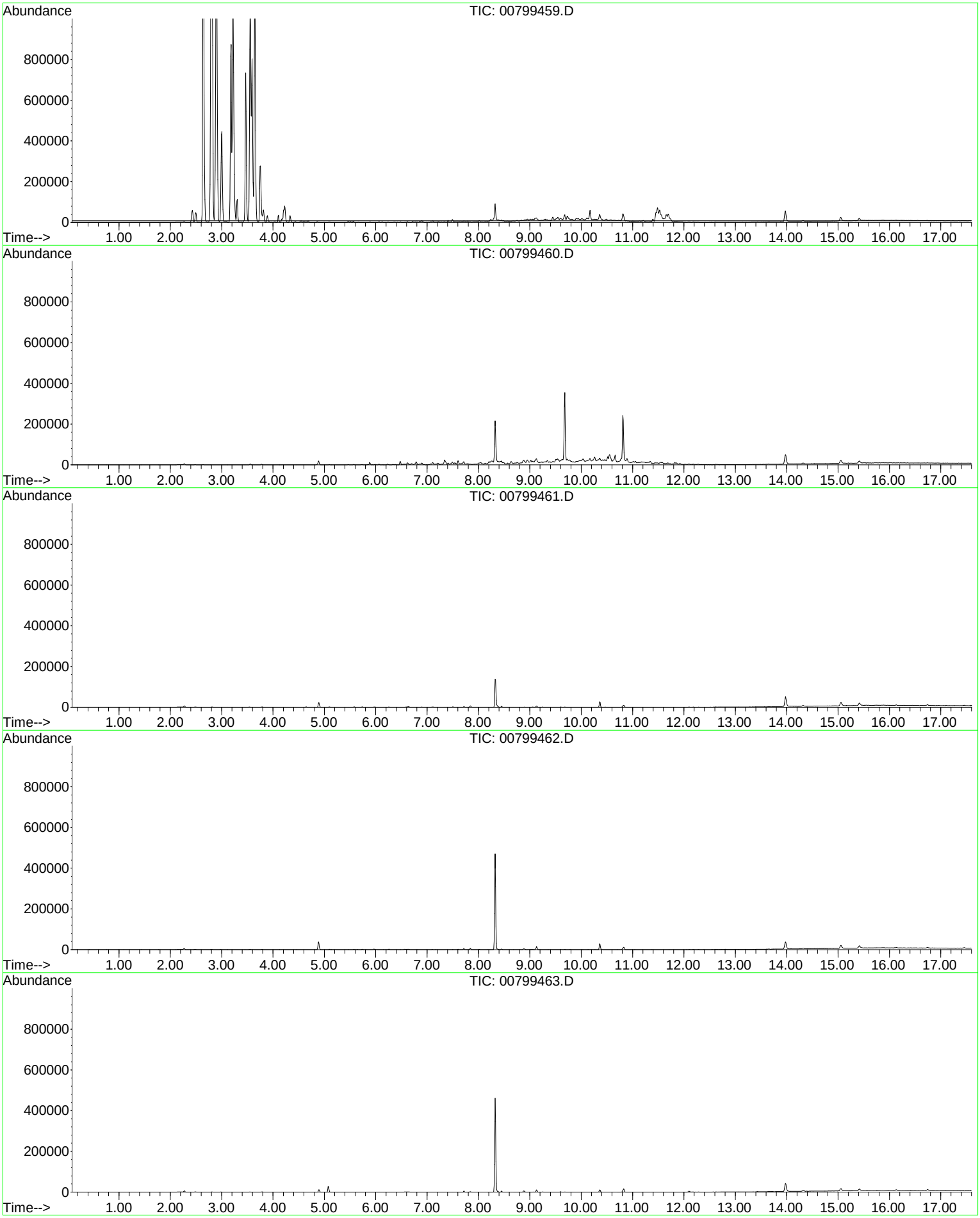

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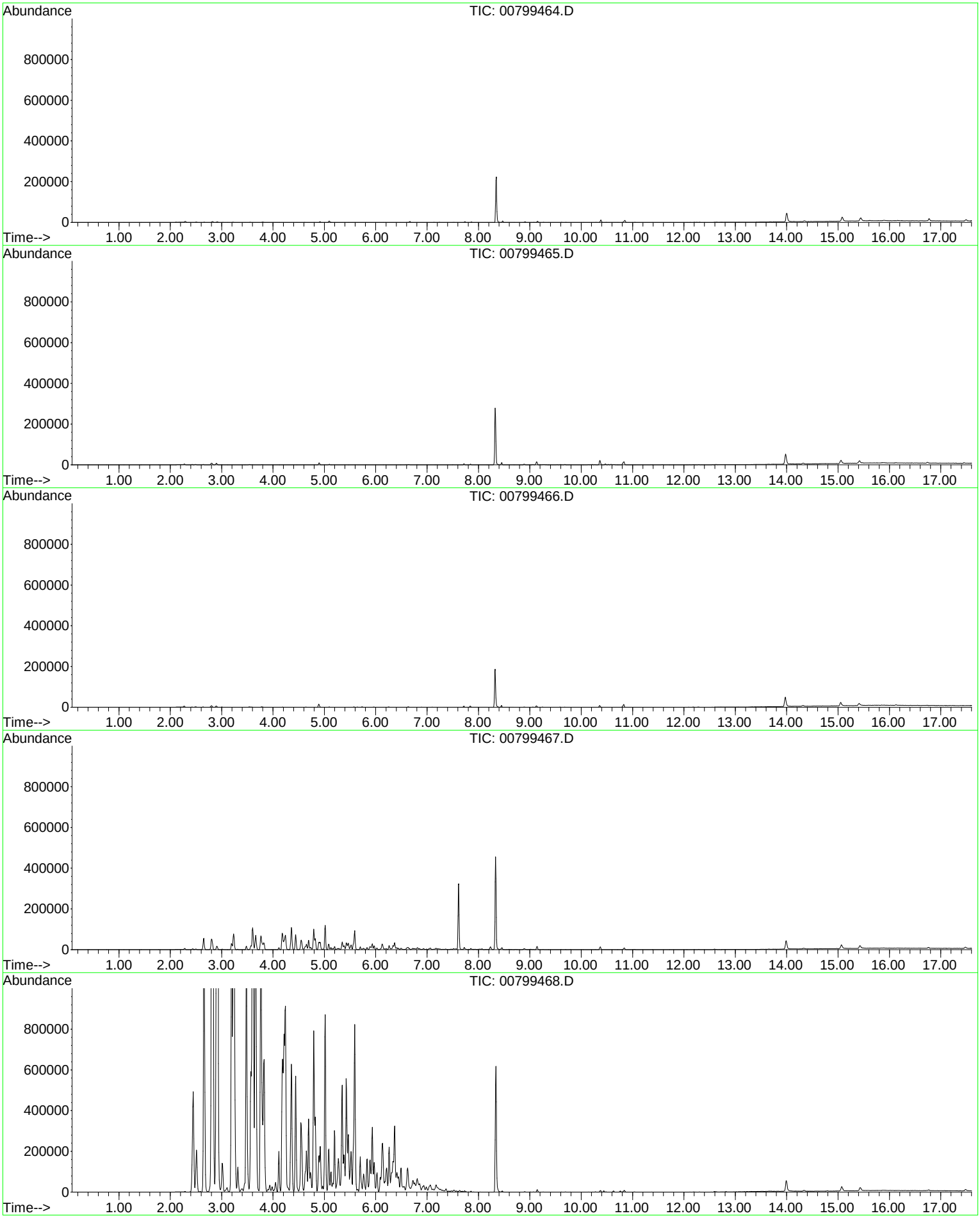

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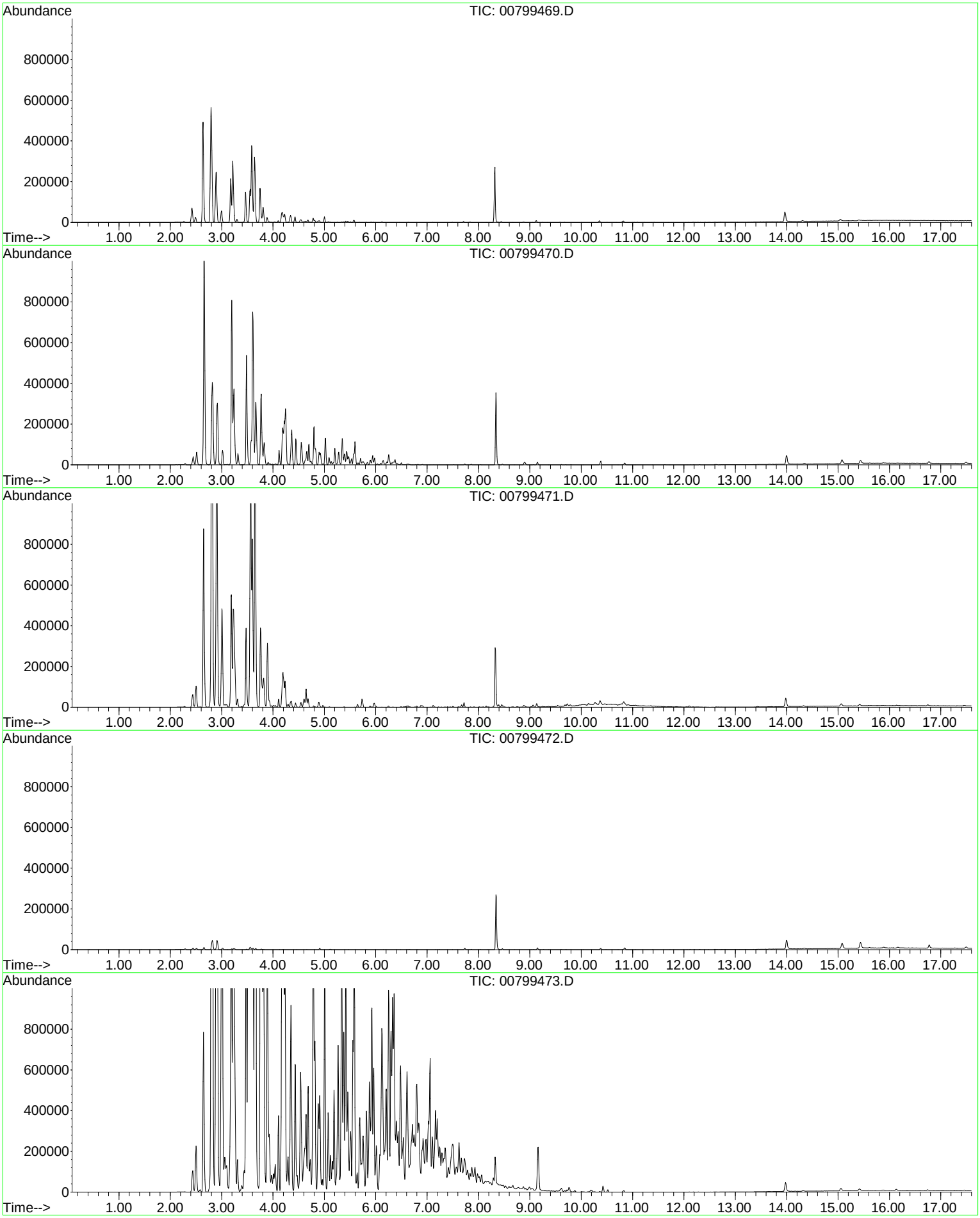
TICS - 02038
In Numerical Order



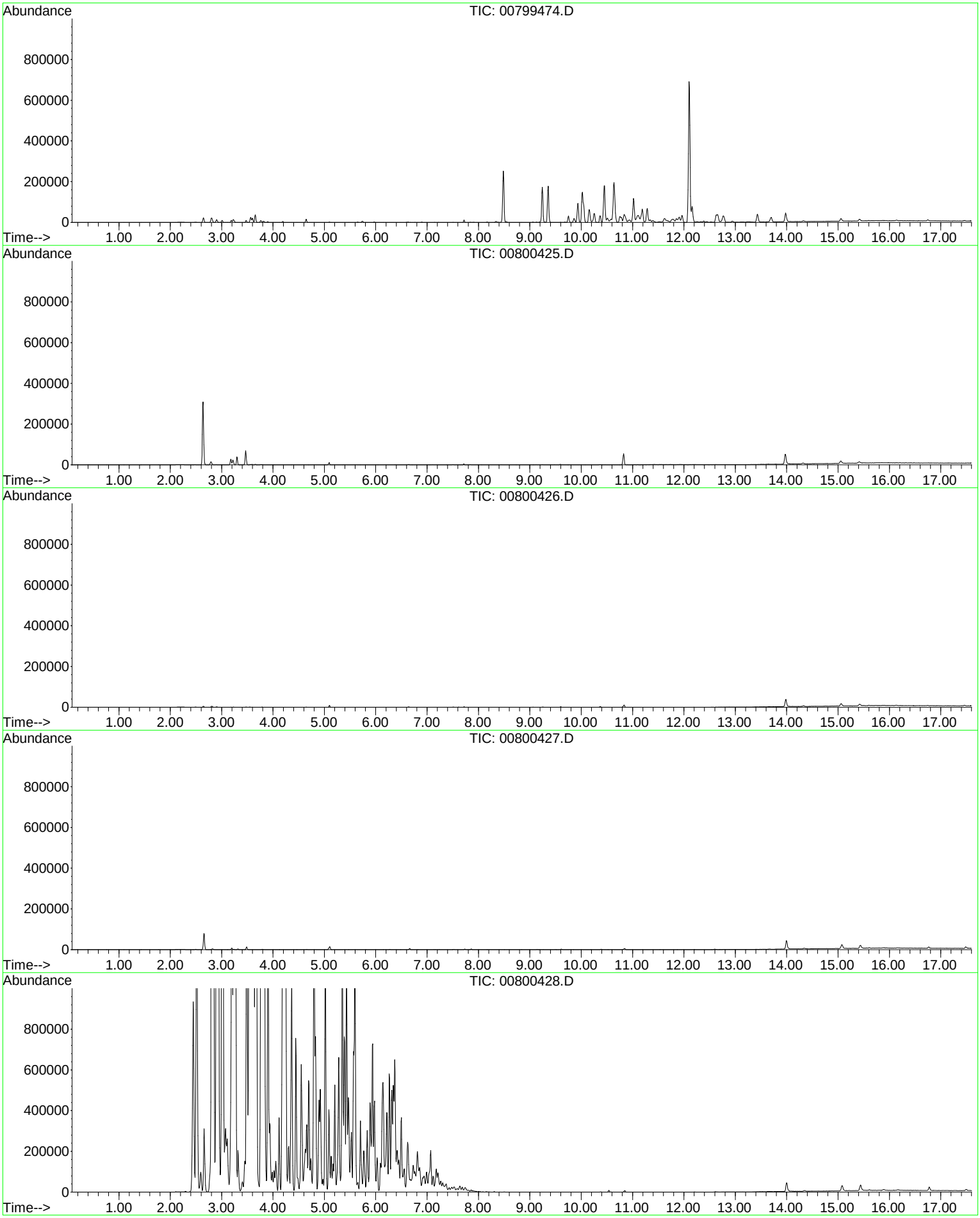

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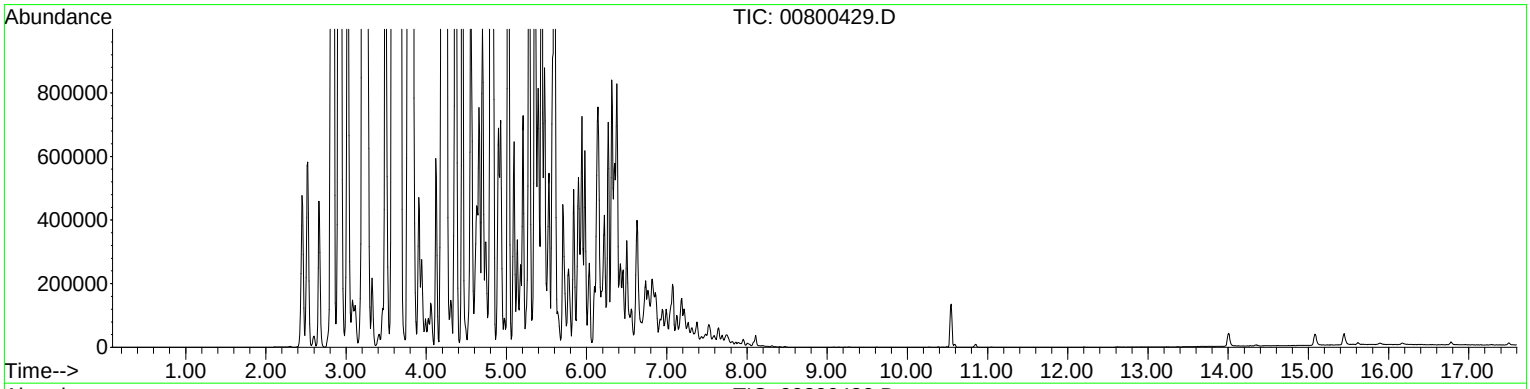
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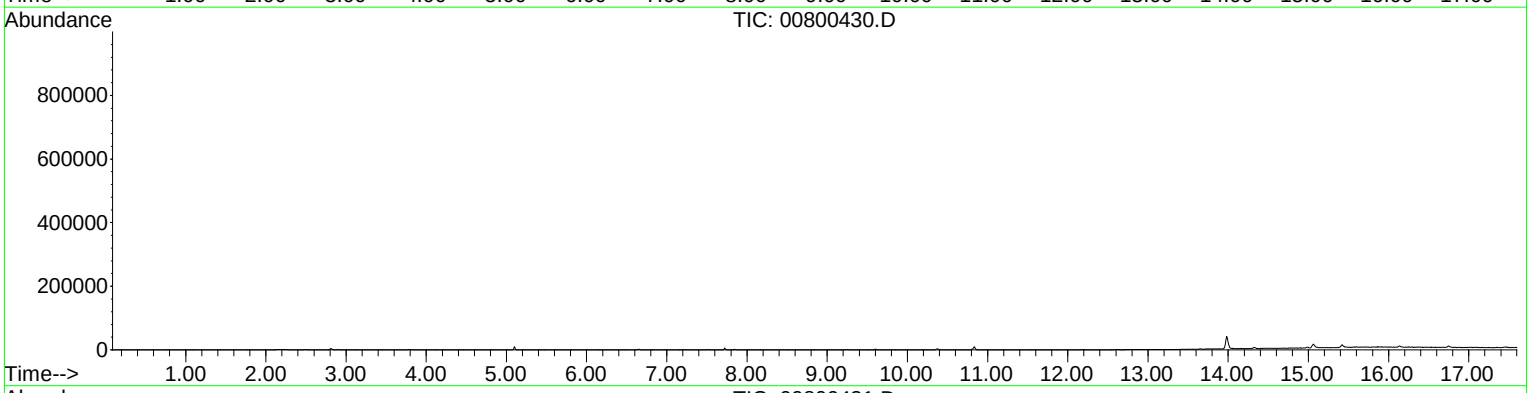


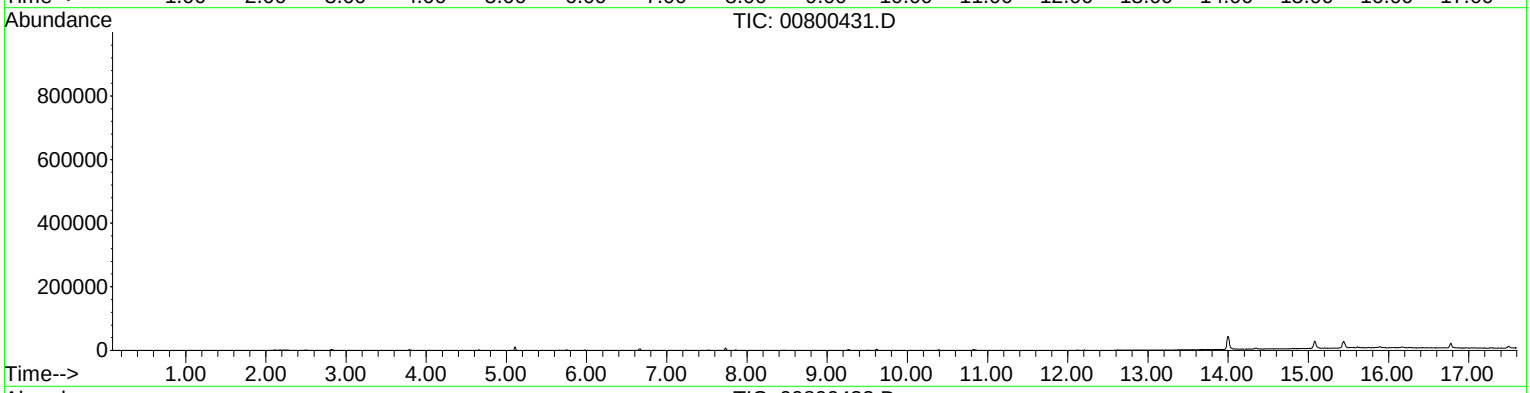
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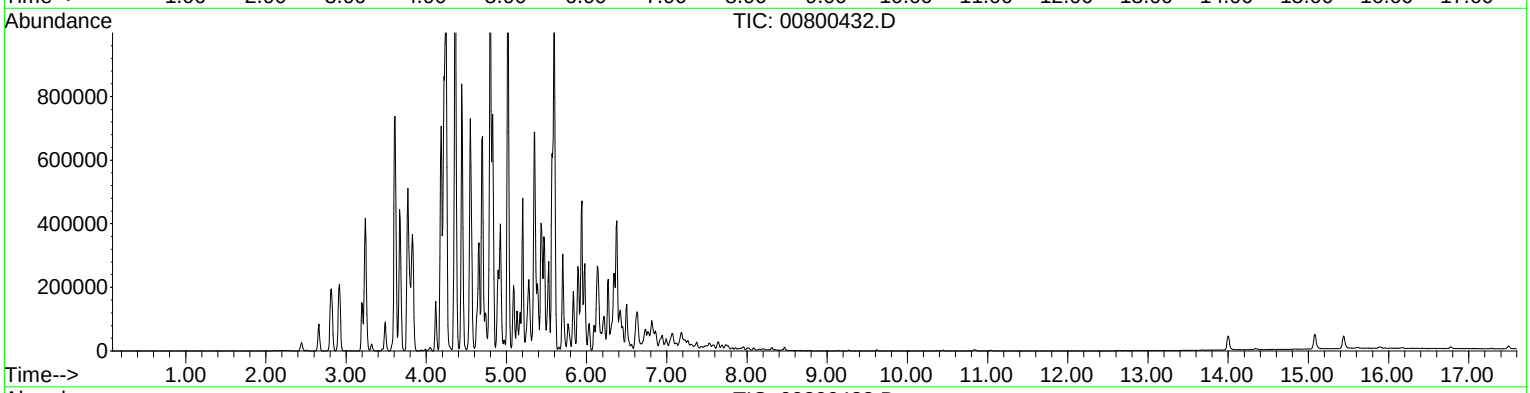


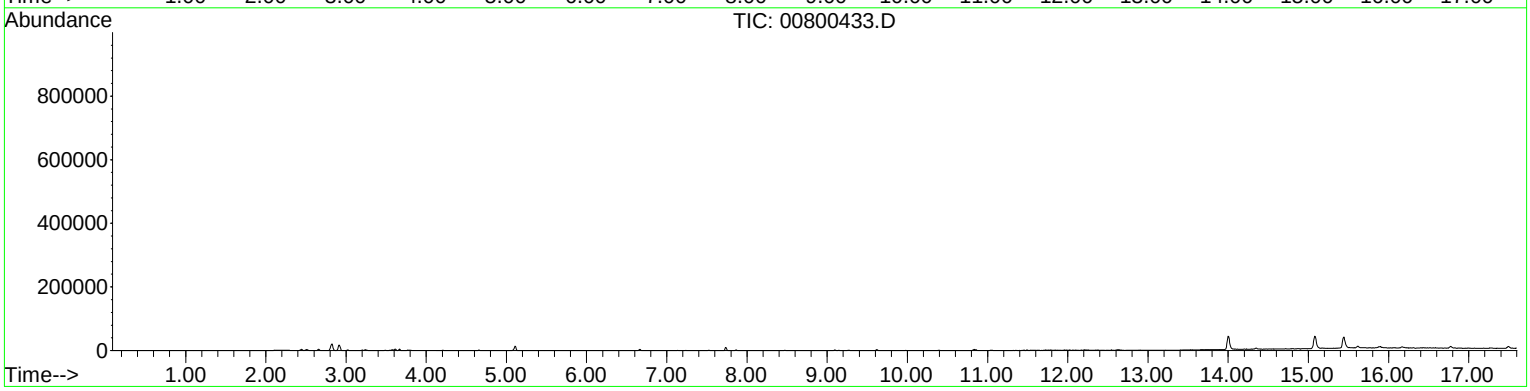
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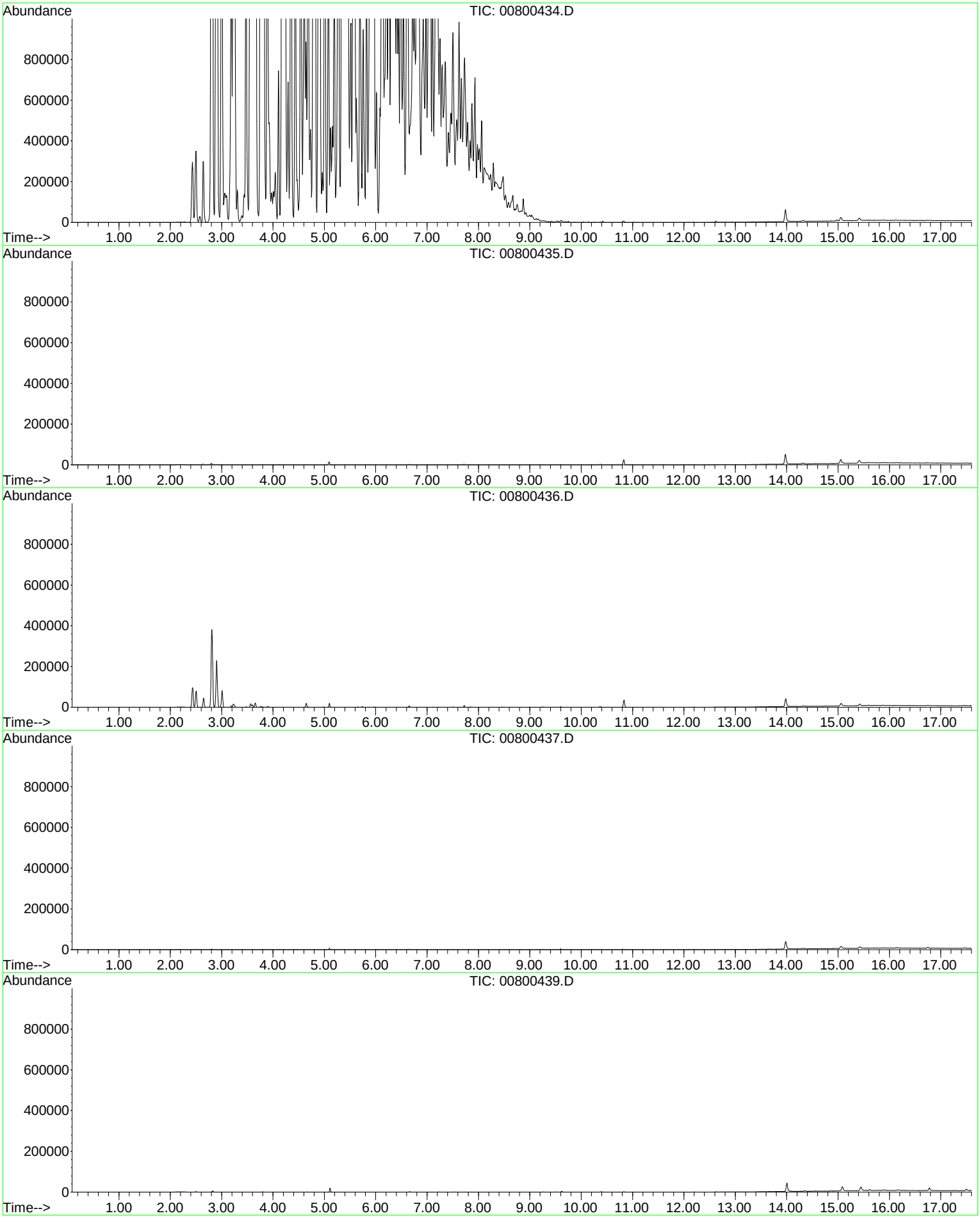




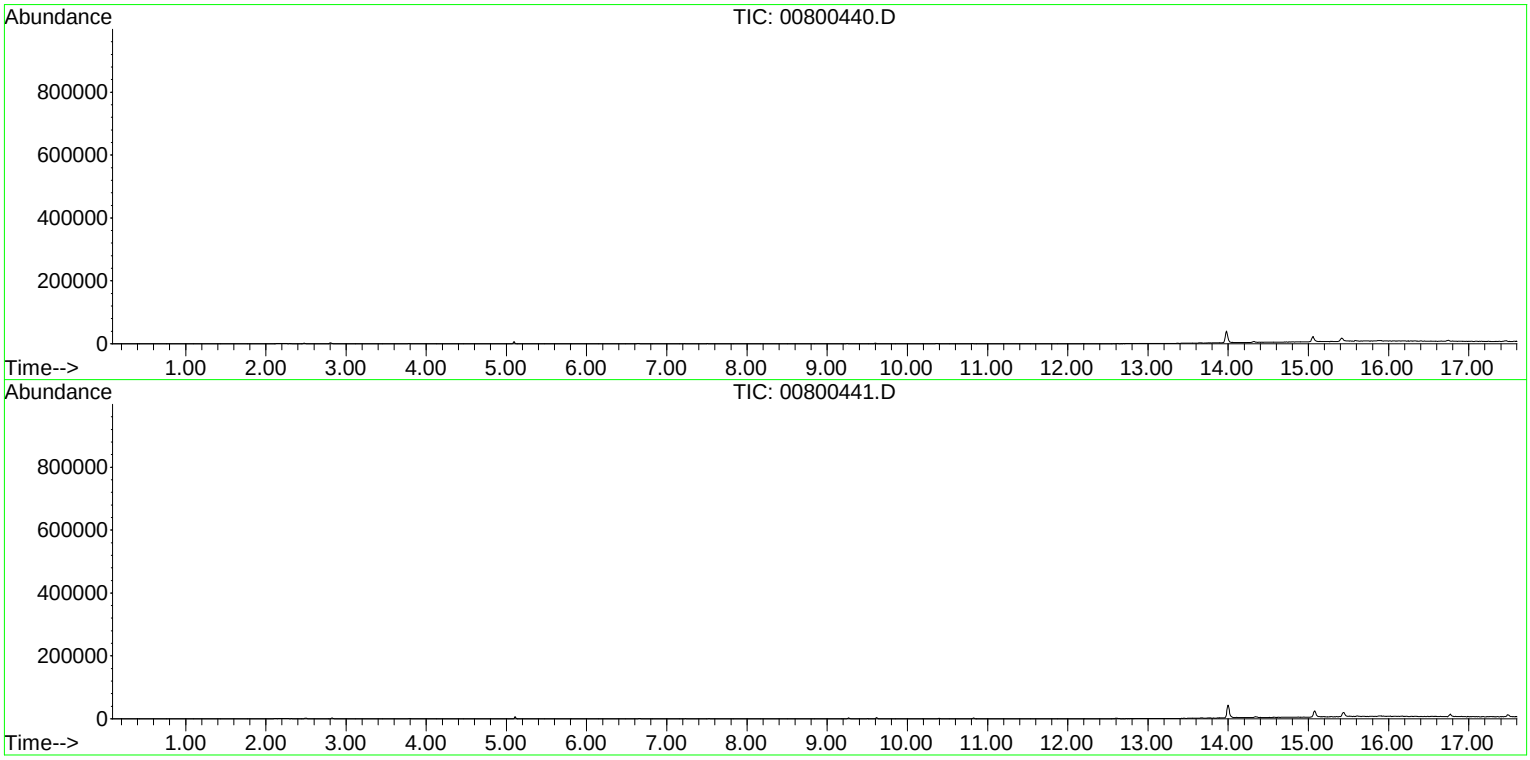







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TICS - 02038
In Numerical Order





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www.agisurveys.net

AMPLIFIED GEOCHEMICAL IMAGING, LLC

Mapping Report

Reformate Release Investigation

Prepared for:

Stantec Consulting
1060 Andrew Drive, Suite 140
West Chester, PA 19380
USA

Prepared on:

October 10, 2018

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Project Summary

Amplified Geochemical Imaging, LLC. (AGI) provided the AGI Environmental Survey used at:

Reformate Release Investigation

The service provided by AGI included delivery of the required quantity of AGI Universal Samplers, analysis by the method described for the requested organic compounds, and reporting of the data. A Laboratory Report was issued previously which summarized the field sampling and analytical procedures, and contained the sample results.

Normally, the maps are scaled to print on a page size of 11 x 17 inches; other sizes are available upon request. General and project specific comments on the contouring and mapping can be found on the next page.

Maps prepared by:

Ray Fenstermacher, P.G.
Project Manager

Maps reviewed/approved by:

Ian McMullen
Chemist

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General Comments

A minimum curvature algorithm was used to interpolate the data from the sample locations to a regularly-spaced grid. The resulting surface is considered to be the smoothest possible surface that will fit the observed values at each sample location (i.e., data honoring). The interpolation is performed in log space, with grid cell sizes approximately one-tenth the average distance between sample locations. For example, when AGI Universal Samplers are placed about 50 feet apart, the grid cell size is set to five feet.

Where observations trend from lower to higher values, and moving towards the edge of the area sampled, the contour surface will continue to rise (showing warmer colors) as no additional data exist to constrain the interpolation. Where observations trend from high to low, towards the edge of the area sampled, the opposite is true.

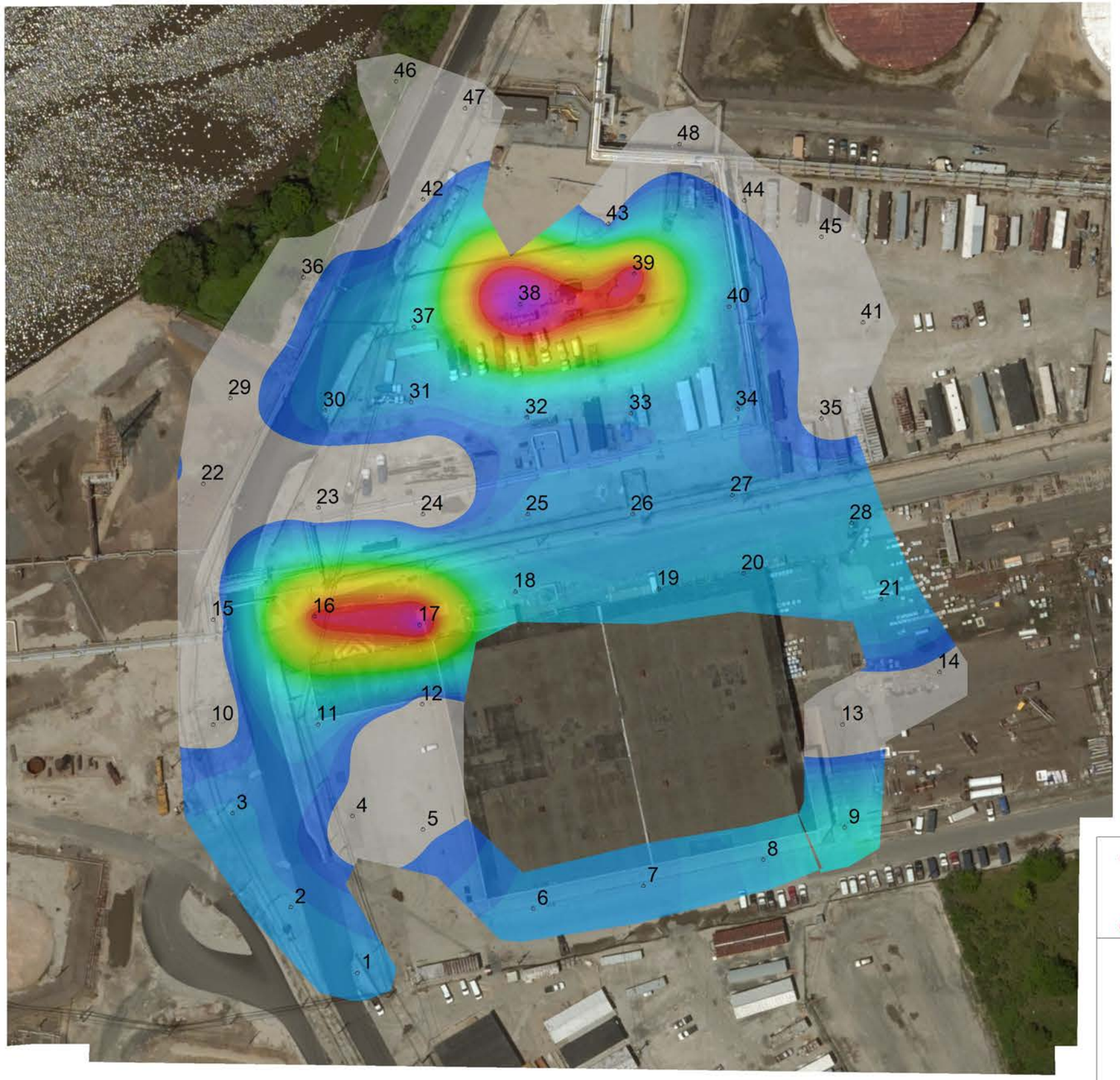
Contour minimums and maximums used in the color interval assignment are established based on the QA blank levels (trip and method blanks), method detection limits, and maximum values observed. The minimum contour level (gray color) is established using the maximum QA blank level or method detection limit, whichever is greater, per compound or groups of compounds . The maximum contour level is set at the maximum value observed, per compound or groups of compounds. Contour interval assignments can be modified at the client's request.

Project Specific Comments

None.

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91.201
65.313
46.774
33.497
23.988

Benzene
Estimated Soil Gas Concentrations [ug/m^3]

Scale 1:1400

50 0 50 100 150 200 250 300

US survey foot

NAD 1983 StatePlane Texas South Central FIPS 4204 Feet

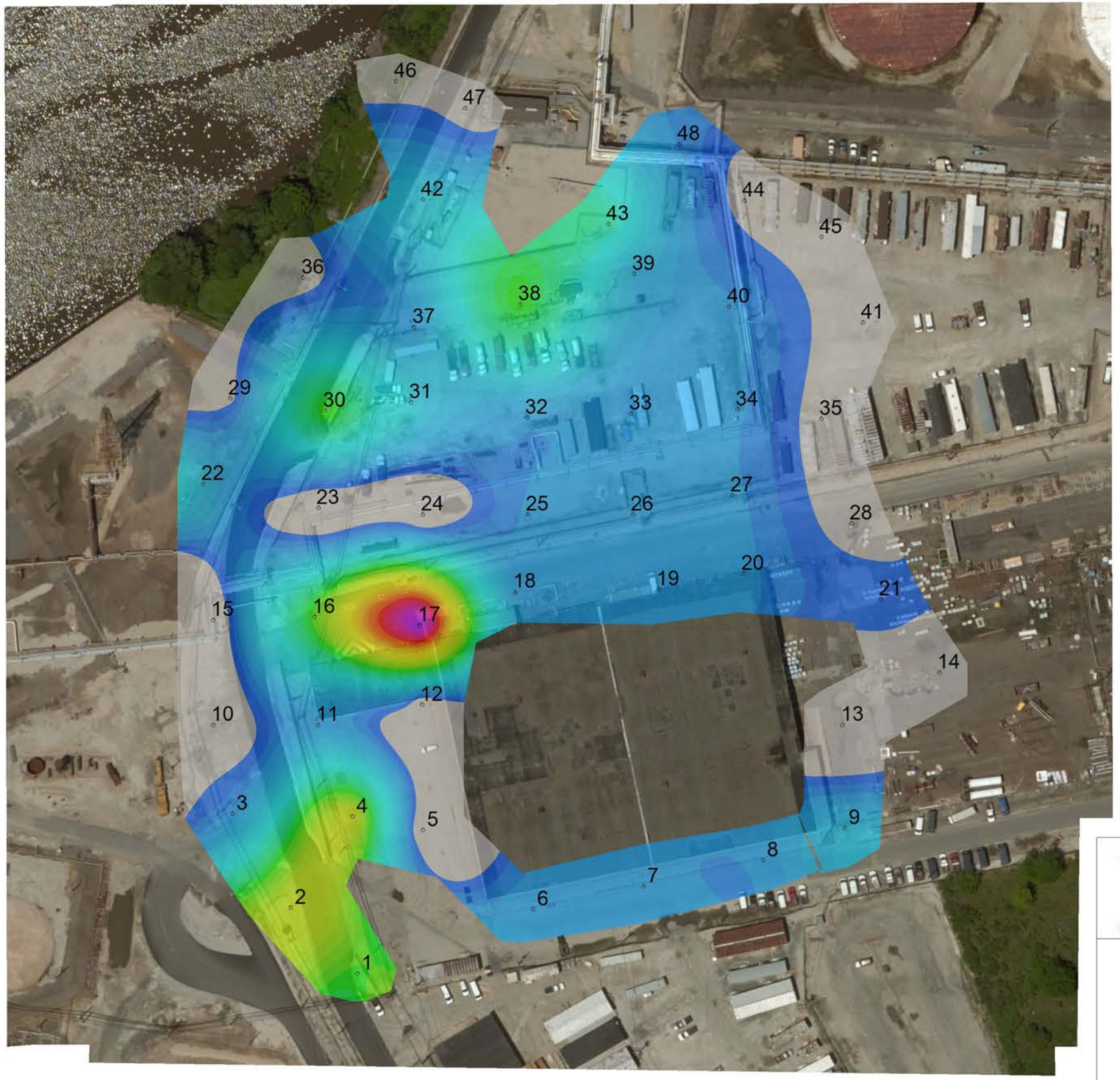
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Stantec Consulting
Reformate Release Investigation
Benzene

DATE DRAWN: Sept 20, 2018	DRAWN BY: RF	ORIG. CAD: stantec_pes_soilgaslocs_20180914.shp
REV. DATE: Sept 25, 2018	REV. #: 1	PROJECT NUMBER: 02038

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11.717
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5.694
3.969
2.767

Toluene
Estimated Soil Gas Concentrations [ug/m^3]

Scale 1:1400

50 0 50 100 150 200 250 300

US survey foot

NAD 1983 StatePlane Delaware FIPS 0700

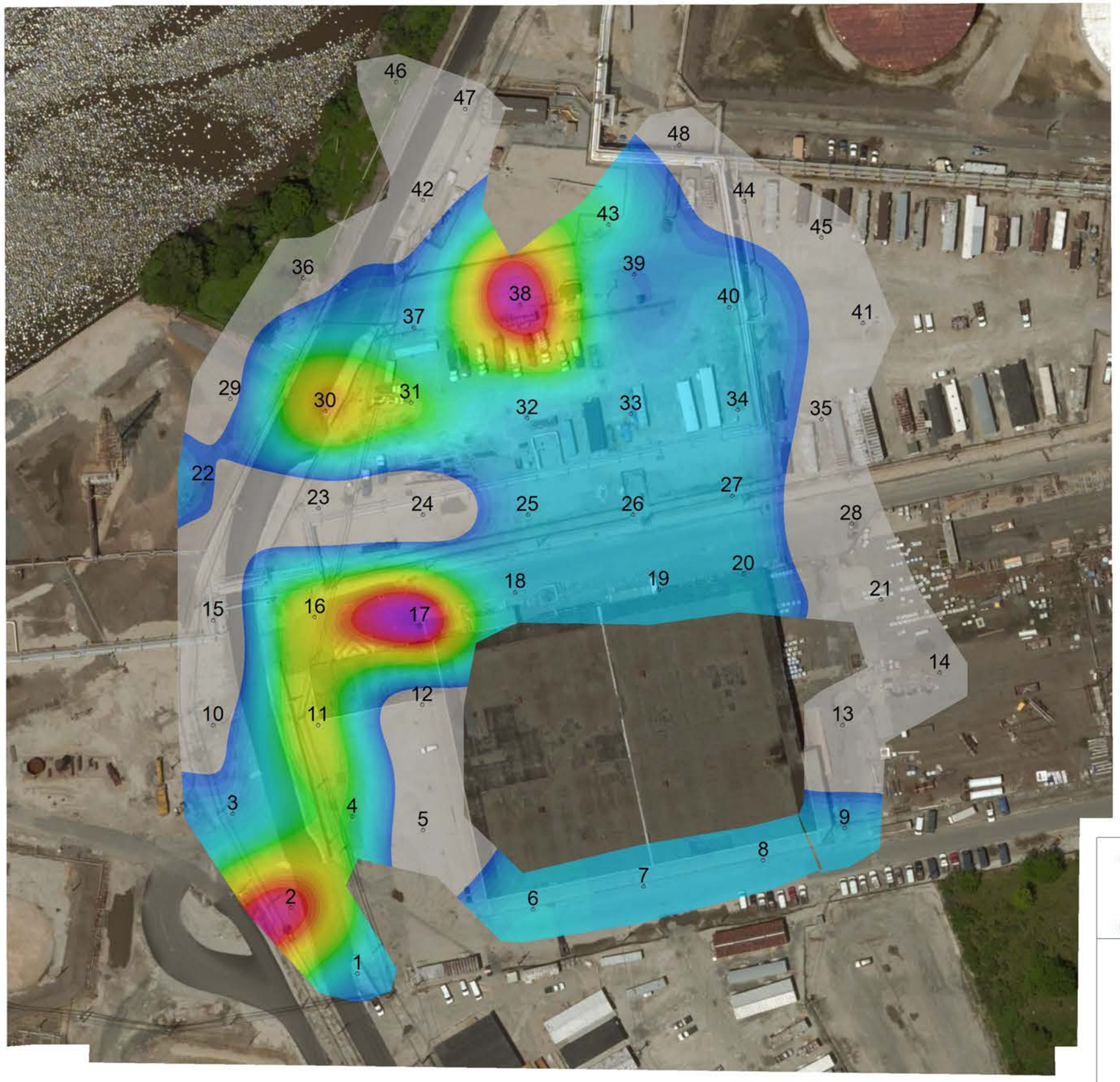
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Stantec Consulting
Reformate Release Investigation
Toluene

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REV. DATE:	REV. #:	PROJECT NUMBER: 02038

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6.187
5.324
4.580
3.941
3.391
2.917

Total Xylenes
Estimated Soil Gas Concentrations [ug/m^3]

Scale 1:1400

50 0 50 100 150 200 250 300

US survey foot

NAD 1983 StatePlane Delaware FIPS 0700 US Survey Feet

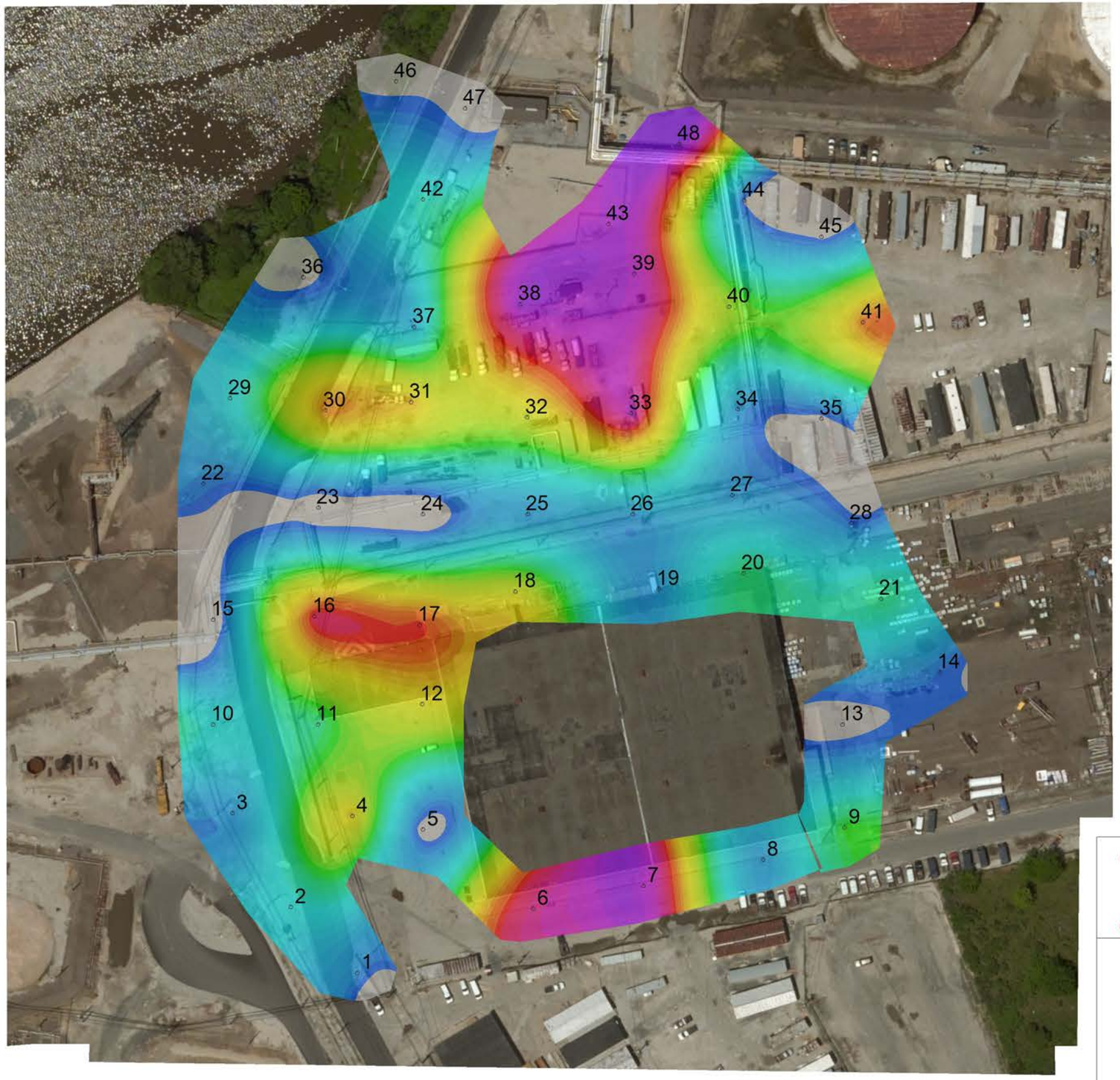
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Reformate Release Investigation
Total Xylenes

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REV. DATE:	REV. #:	PROJECT NUMBER: 02038

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GRPH

Estimated Soil Gas Concentrations [ug/m^3]

Scale 1:1400

50 0 50 100 150 200 250 300

US survey foot

NAD 1983 StatePlane Delaware FIPS 0700 US Survey Feet

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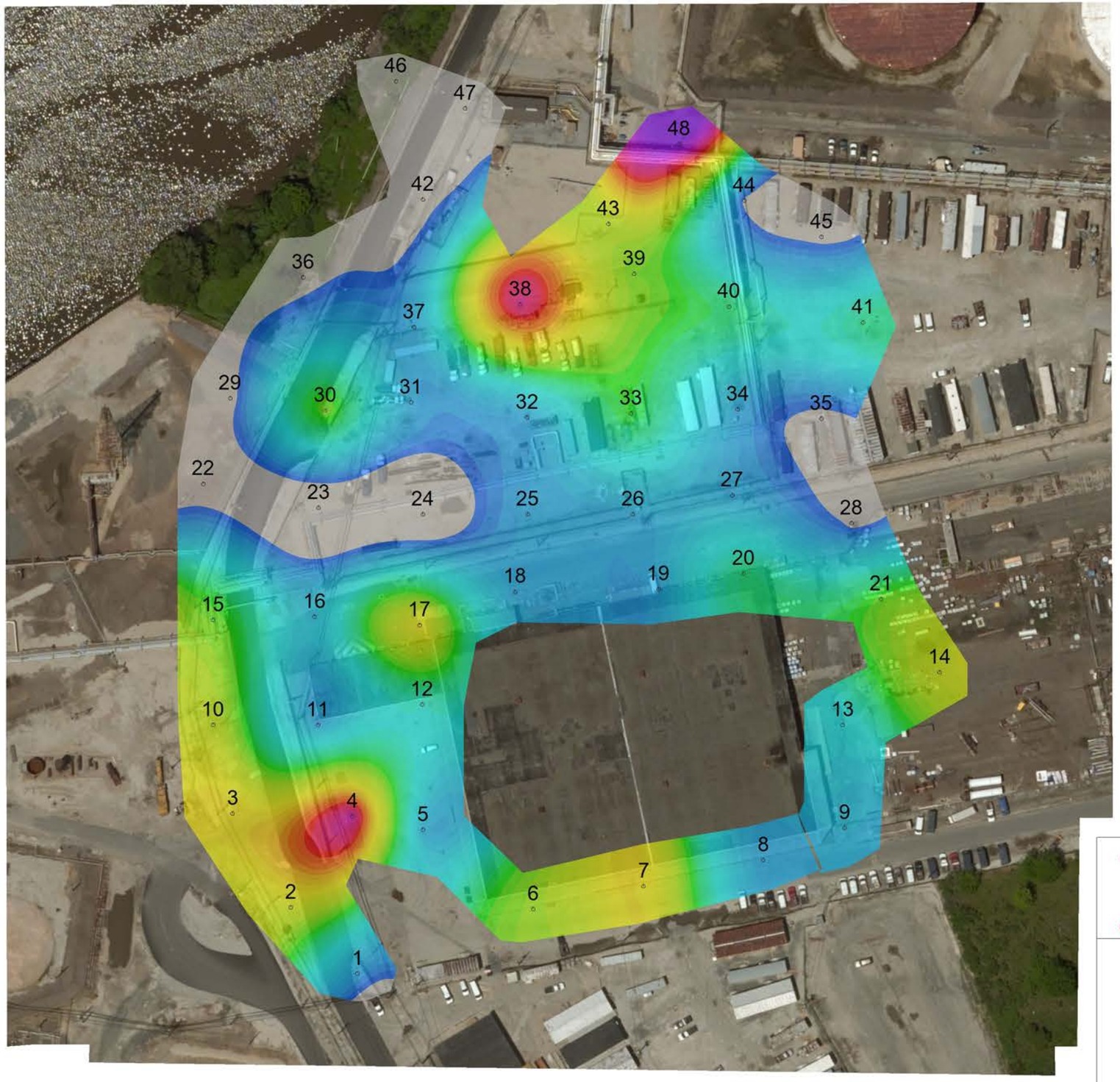
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Gasoline Range Petroleum Hydrocarbons

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REV. DATE: Sept 25, 2018	REV. #: 1	PROJECT NUMBER: 02038

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61.094
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29.785
23.442

DRPH
Estimated Soil Gas Concentrations [ug/m^3]

Scale 1:1400

50 0 50 100 150 200 250 300

US survey foot

NAD 1983 StatePlane Delaware FIPS 0700

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Stantec Consulting
Reformate Release Investigation
Diesel Range Petroleum Hydrocarbons

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Lakewood, CO 80235 USA
Phone: +1-303-988-1968
Fax: +1-303-986-2898

www.agisurveys.net

Appendix M MiHpt Logs

EC (mS/m)

PID Max (µV ×10^5)

Est. K (ft/day)

HPT Press. Avg (psi)

HPT Flow Avg (mL/min)

Depth (ft)

Abs. Piezometric Pressure (psi)

Direct Image® By Geoprobe Systems®

		File: MIHPT - 1.MHP
Company: Parratt-Wolff	Operator: Danylo Kulczycky	Date: 8/21/2018
Project ID: PES Refinery	Client: STANTEC	Location: Philadlphia, PA

EC (mS/m)

PID Max (µV ×10^6)

Est. K (ft/day)

HPT Press. Avg (psi)

HPT Flow Avg (mL/min)

Depth (ft)

Abs. Piezometric Pressure (psi)

Direct Image By Geoprobe Systems®

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Company: Parratt-Wolff	Operator: Danylo Kulczycky	Date: 8/21/2018
Project ID: PES Refinery	Client: STANTEC	Location: Philadlphia, PA

EC (mS/m)

PID Max ($\mu V \times 10^6$)

Est. K (ft/day)

HPT Press. Avg (psi)

HPT Flow Avg (mL/min)

Depth (ft)

Abs. Piezometric Pressure (psi)

Direct Image By Geoprobe Systems®

			File: MIHPT - 3.MHP
Company: Parratt-Wolff	Operator: Danylo Kulczycky		Date: 8/21/2018
Project ID: PES Refinery	Client: STANTEC		Location: Philadlphia, PA

EC (mS/m)

PID Max (µV ×10^5)

Est. K (ft/day)

HPT Press. Avg (psi)

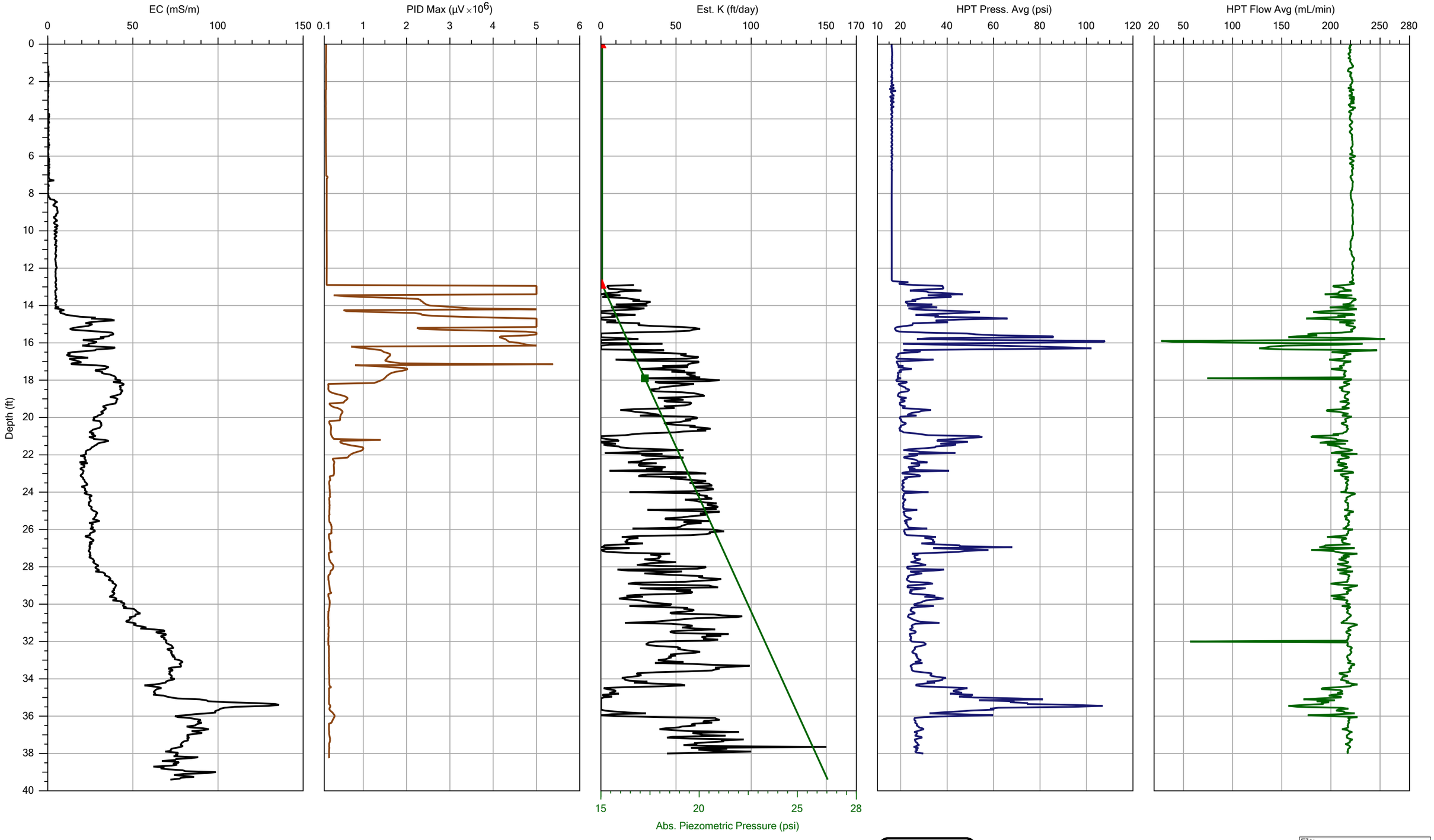
HPT Flow Avg (mL/min)

Depth (ft)

Abs. Piezometric Pressure (psi)

Direct Image® By Geoprobe Systems®

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Project ID: PES Refinery	Client: STANTEC	Location: Philadlphia, PA



Direct Image® By Geoprobe Systems®

			File: MIHPT - 5.MHP
Company: Parratt-Wolff	Operator: Danylo Kulczycky		Date: 8/22/2018
Project ID: PES Refinery	Client: STANTEC		Location: Philadlphia, PA

EC (mS/m)

PID Max (µV ×10^7)

Est. K (ft/day)

HPT Press. Avg (psi)

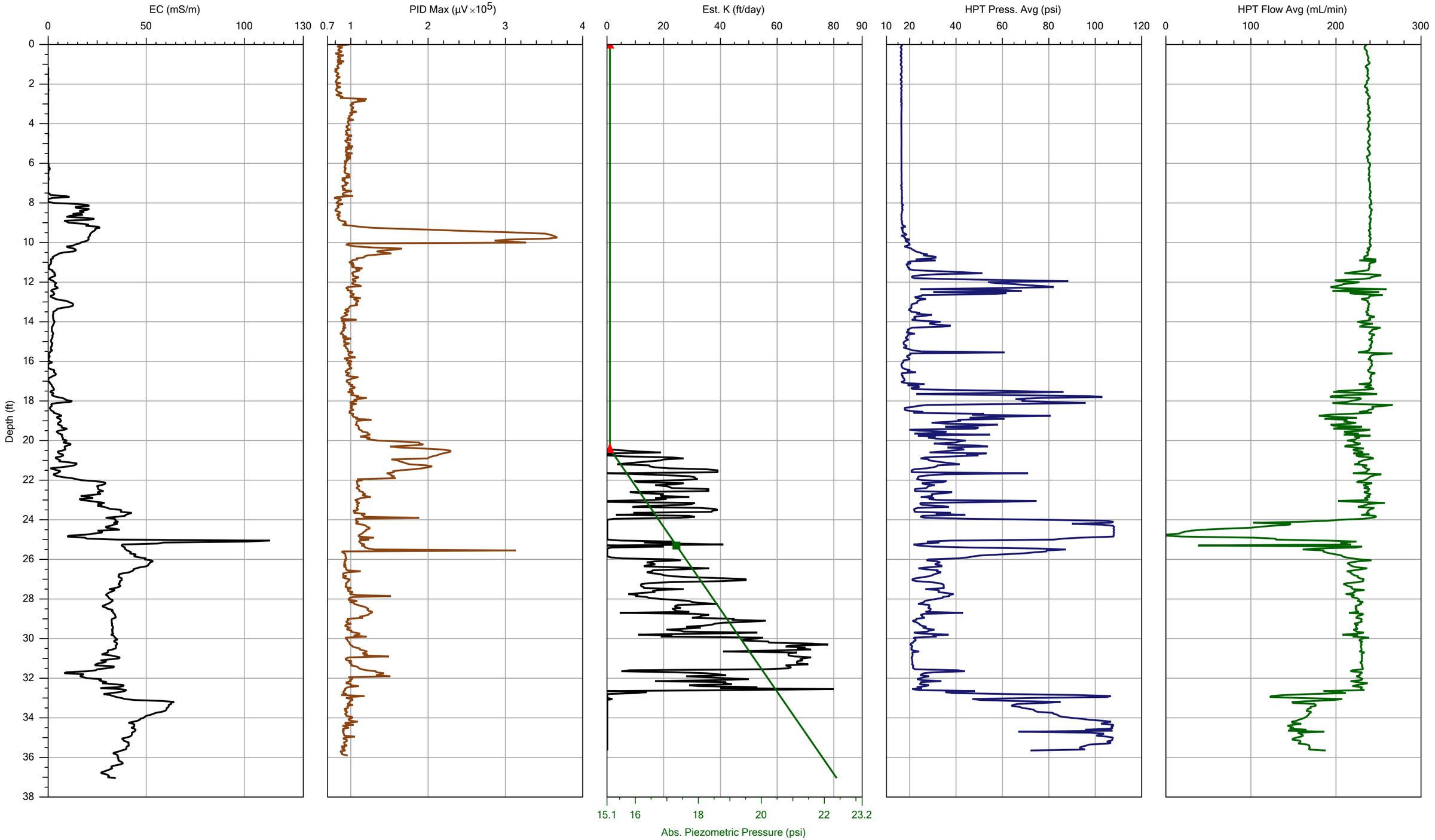
HPT Flow Avg (mL/min)

Depth (ft)

Abs. Piezometric Pressure (psi)

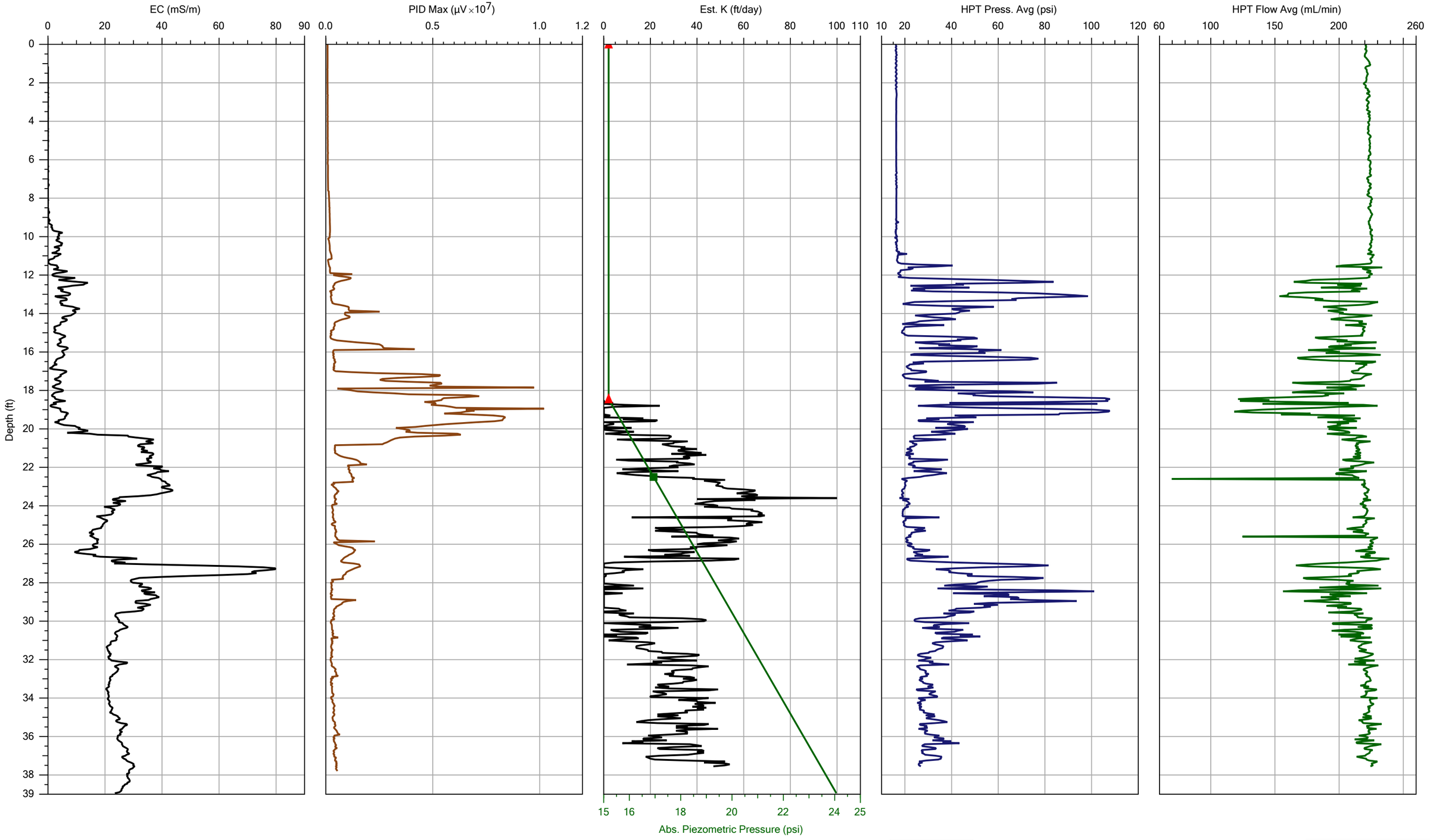
Direct Image® By Geoprobe Systems®

			File: MIHPT - 6.MHP
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Project ID: PES Refinery		Client: STANTEC	Location: Philadlphia, PA



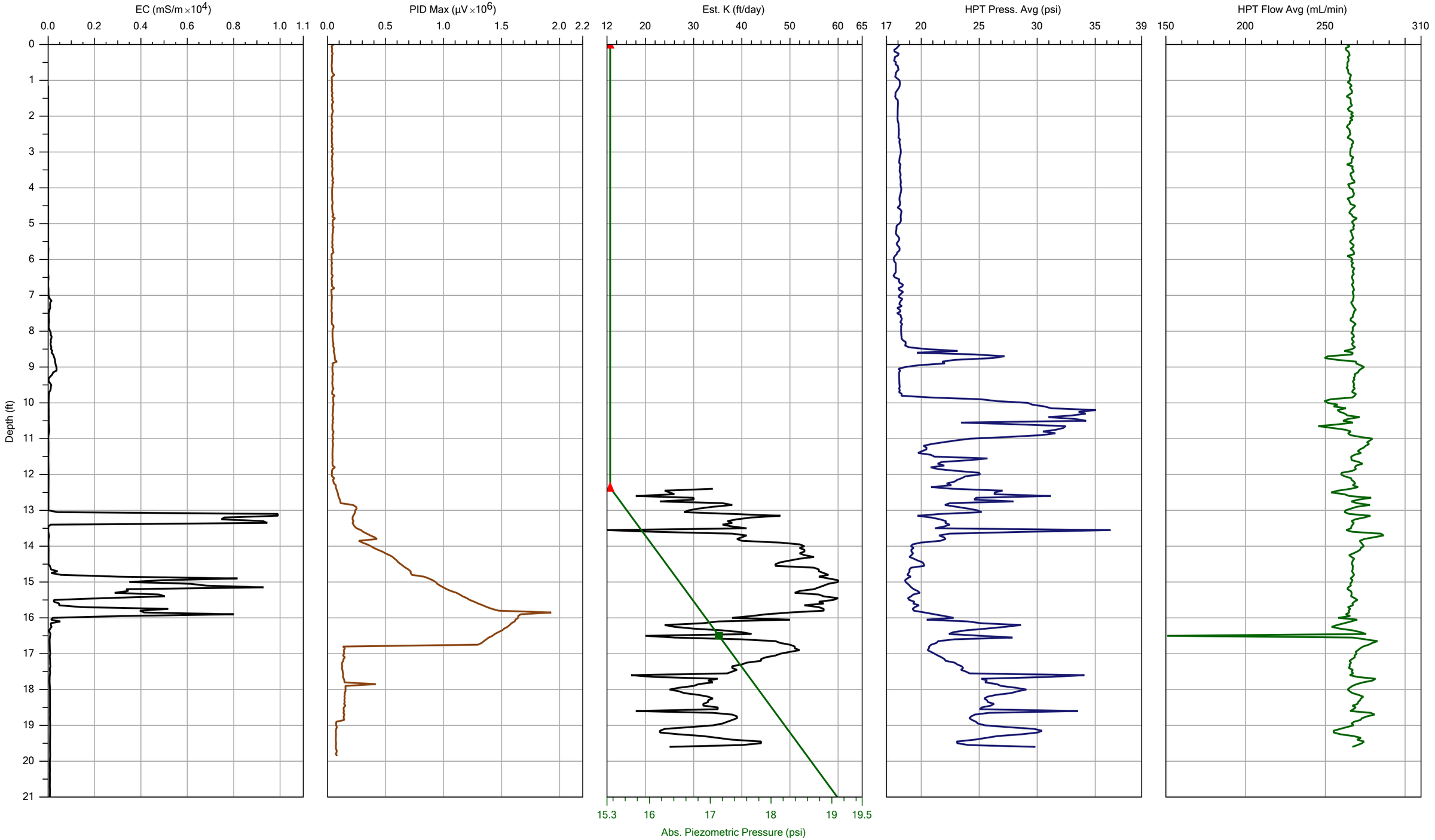
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Project ID: PES Refinery	Client: STANTEC	Location: Philadlphia, PA



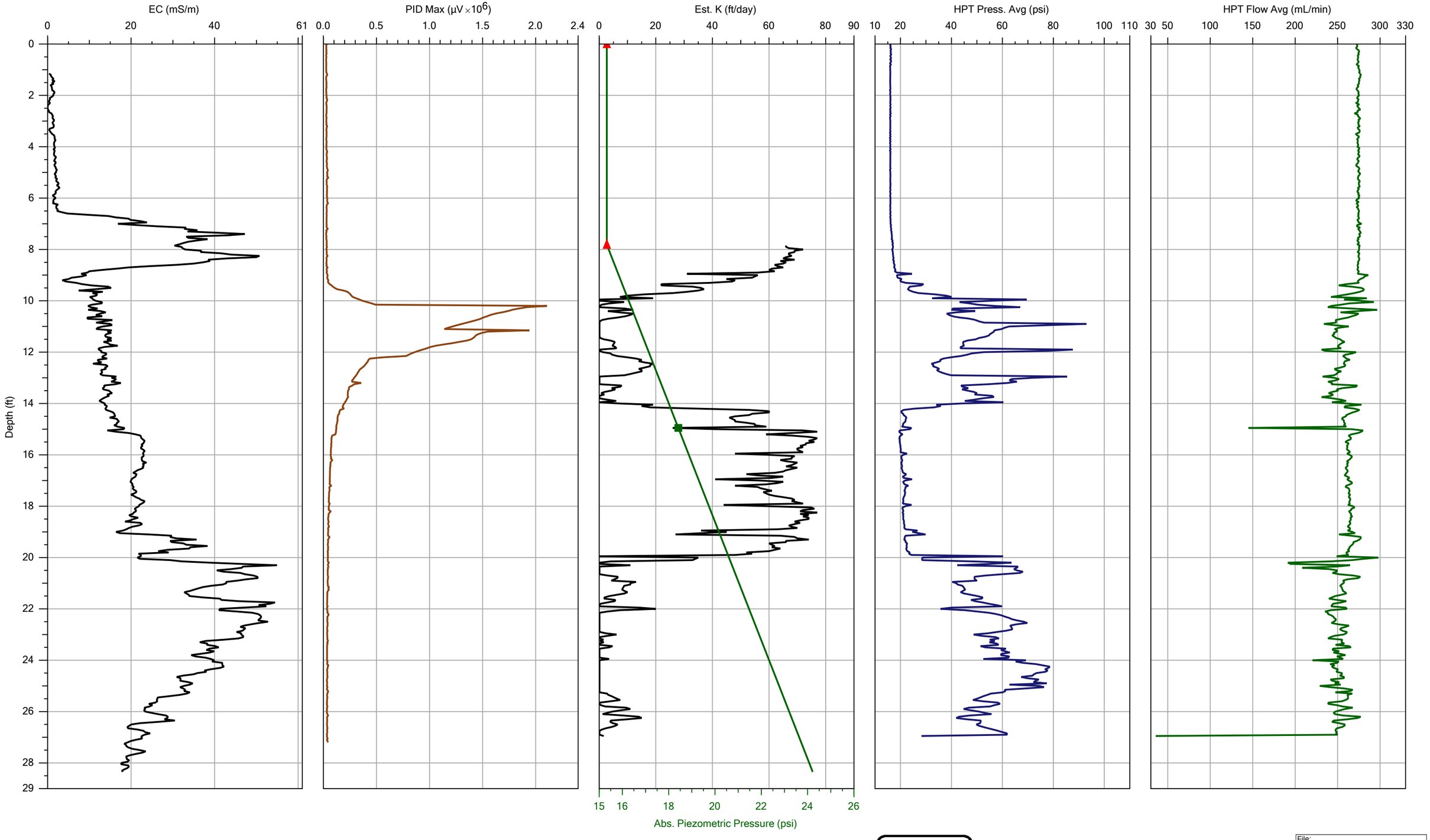
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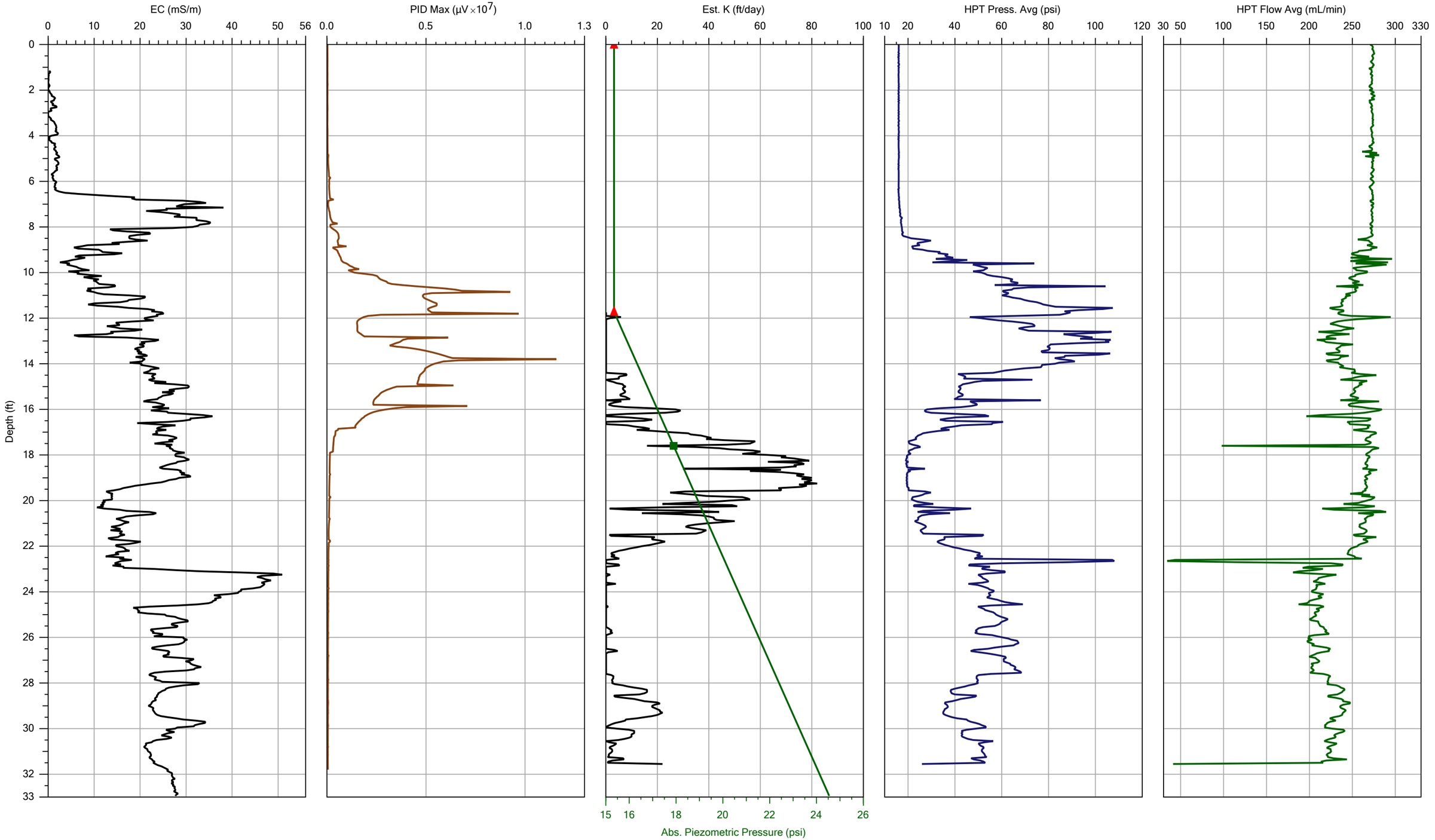
Direct Image® By Geoprobe Systems®

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Project ID: PES	Client: Stantec	Location: MiHpt - 9



Direct Image By Geoprobe Systems®

		File: MIHPT - 10.MHP
Company: Parratt-Wolff	Operator: Danylo Kulczycky	Date: 9/27/2018
Project ID: PES	Client: Stantec	Location: MiHpt - 10



Direct Image® By Geoprobe Systems®

		File: MIHPT - 11.MHP
Company: Parratt-Wolff	Operator: Danylo Kulczycky	Date: 9/27/2018
Project ID: PES	Client: Stantec	Location: MiHpt - 11

EC (mS/m $\times 10^3$)

0 1 2 3 4 4.9

PID Max (µV $\times 10^4$)

2.3 3 4 5 5.9

Est. K (ft/day)

0 50 100 150 170

HPT Press. Avg (psi)

10 20 40 60 80 100 120

HPT Flow Avg (mL/min)

20 50 100 150 200 250 300320

Depth (ft)

0 5 10 15 20 25 30 35 40 45 50 55 57

15 20 25 30 35 39

Abs. Piezometric Pressure (psi)

Direct Image® By Geoprobe Systems®

		File: MIHPT - 12.MHP
Company: Parratt-Wolff	Operator: Danylo Kulczycky	Date: 9/27/2018
Project ID: PES	Client: Stantec	Location: MiHpt - 12

Appendix N UVOST® Reports, 2019 and 2022

High Resolution Site Characterization Report – UVOST®-HP Investigation

Client: Stantec

Project Name: PES Complex

Location: Philadelphia, Pennsylvania

Prepared by:

Dakota Technologies Company, LLC

83 Nickerson Road, Unit 1B

Ashland, Massachusetts 01721

443.534.3878

May 31, 2019

Project Number: 0159.19

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2.0 HYDRAULIC PROFILING (HP) DESCRIPTION 2

3.0 DISCUSSION AND COMMENTS.....3

4.0 LIMITATIONS.....4

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Appendix B UVOST®-HP Logs at 10% RE
Appendix C UVOST®-HP Logs 350% RE
Appendix D Advanced Analysis
Appendix E UVOST®-HPReference Log

1.0 ULTRA-VIOLET OPTICAL SCREENING TOOL (UVOST®) DESCRIPTION & ANALYSIS

Fluorescence is a property of some compounds where absorbed ultra-violet (UV) light stimulates the emission of photons (light) of a longer wavelength relative to the source emission. The release of the photons can be used to detect small amounts of substance (i.e., polycyclic aromatic hydrocarbons (PAHs)) in a larger matrix (soil). This method of detection has been used in laboratories for decades. With the commercial availability of lasers and optical fibers, this technology can also be applied in-situ in the field to identify the presence of light non-aqueous phase liquids (LNAPL).

The UVOST® system sends laser light (308 nanometer wavelength) through a fiber optic cable strung within probe rods on a direct push drill rig. The light, reflected by a parabolic mirror, then exits through a sapphire window in the side of the probe. As the probe is advanced, the immediately adjacent soil is exposed to the UV laser light. If PAHs (compounds in petroleum oils and lubricants that fluoresce) are present, longer wavelength light is emitted by the PAH compounds. This "signal" light is transmitted through a return fiber, back to the surface to be analyzed. Responses are indicated in real-time on a graph of signal vs. depth. The UVOST® log displays "color mixed" signal logs consisting of contributions from four wavelength channels, and waveforms ("fingerprint" of multi-wavelength) to aid in identification and relative quantity of the compound present.

Prior to every log, the UVOST® system is checked for optical quality by observing the background signal for sources of signal in the fiber, filter, mirror and sapphire window. Also, the reference emitter (a standard, proprietary LNAPL mixture called the "RE") is placed on the window to determine the qualitative and semi-quantitative properties of the laser system. This is to assure that the RE response has the correct shape and intensity and that the UVOST® system is calibrated to log. Typically, the RE will fall between 10,000 and 12,000 picovolt-seconds (pVs), which is a measure of waveform area. The background can vary from 0.1% to 1%, which is typically an area of approximately 0 to 100 pVs. The relationship between the instrument responses from NAPL in the subsurface and the RE depends on the properties of the NAPL. The calibration of the system is not to a concentration, but to a known fluorescence signature.

2.0 Hydraulic Profiling (HP) Description

The Hydraulic Profiling add-on is a logging tool that measures the pressure required to inject a flow of water into the soil as the probe is advanced into the subsurface. The injection pressure log is an excellent indicator of formation permeability. In addition to injection pressure, hydrostatic pressure can be measured under a zero flow condition, called a dissipation test. This allows a calculation of potentiometric surface (water table) upon successful completion of the dissipation test.

Prior to starting a log, there is a quality assurance (QA) check on the down-hole transducer to ensure proper function. The probe is submerged in a reference tube and filled with water. A reading is taken at the hydraulic port when it is submerged to a depth of 1 foot and a second reading at 0 feet, or baseline, under zero flow conditions. The reading at 0 feet, or the baseline pressure, is equal to the measurement of atmospheric pressure. Subtracting reading 2 from reading 1 should produce a result of 0.433 psi (+/- 10%), which is the hydrostatic weight of a 1 foot column of water.

The UVOST®-HP probe is advanced into the ground at a rate of approximately 2 cm/sec. The pump in the HP flow module draws water from the supply tank and pumps water down the trunk line at a constant flow rate (60 mL/min). The downhole transducer monitors the pressure generated by injecting water into the formation matrix. The log provides graphs of the pressure and flow rate versus depth alongside the fluorescence plot. If a dissipation test is performed below the water table and the test successfully stabilizes, the result can be corrected to an absolute hydrostatic value, from which a potentiometric surface (water table) can be calculated. Using the calculated water table to correct for hydrostatic pressure increase, a hydraulic conductivity (K) value for a given depth below the water table can be estimated using the following equation:

$$K = \ln(Q/P') * 20.0 + 7.0$$

where P'= downhole pressure – (0.433 * depth below water table) – atmospheric pressure, and Q is equal to flow. K values above the water table are also reported after a successful dissipation test even though they are suspect due to varying permeability behavior of dry soils. These values still maintain some qualitative value to the eye, and may lend insight into preferential pathways in the vadose zone.

3.0 DISCUSSION AND COMMENTS

Dakota Technologies completed 15 UVOST-HP borings in conjunction with Parratt Wolff to a maximum depth of 42 feet.

Fluorescence indicating the presence of LNAPL was observed in each of the 15 borings completed.

4.0 LIMITATIONS

The analysis and opinions expressed in this report are based upon data obtained from the specific test locations and from other information discussed in this report. Exceptions, if any, are discussed in the accompanying comments section of this report. This report is prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted practices. Reported results shall not be reproduced, except in full, without written approval of Dakota. No warranties, expressed or implied are intended or made.

Appendix A

UVOST®-HP Field Summary Log

DAKOTA TECHNOLOGIES

UVOST®-HP Field Summary Log

PES Complex

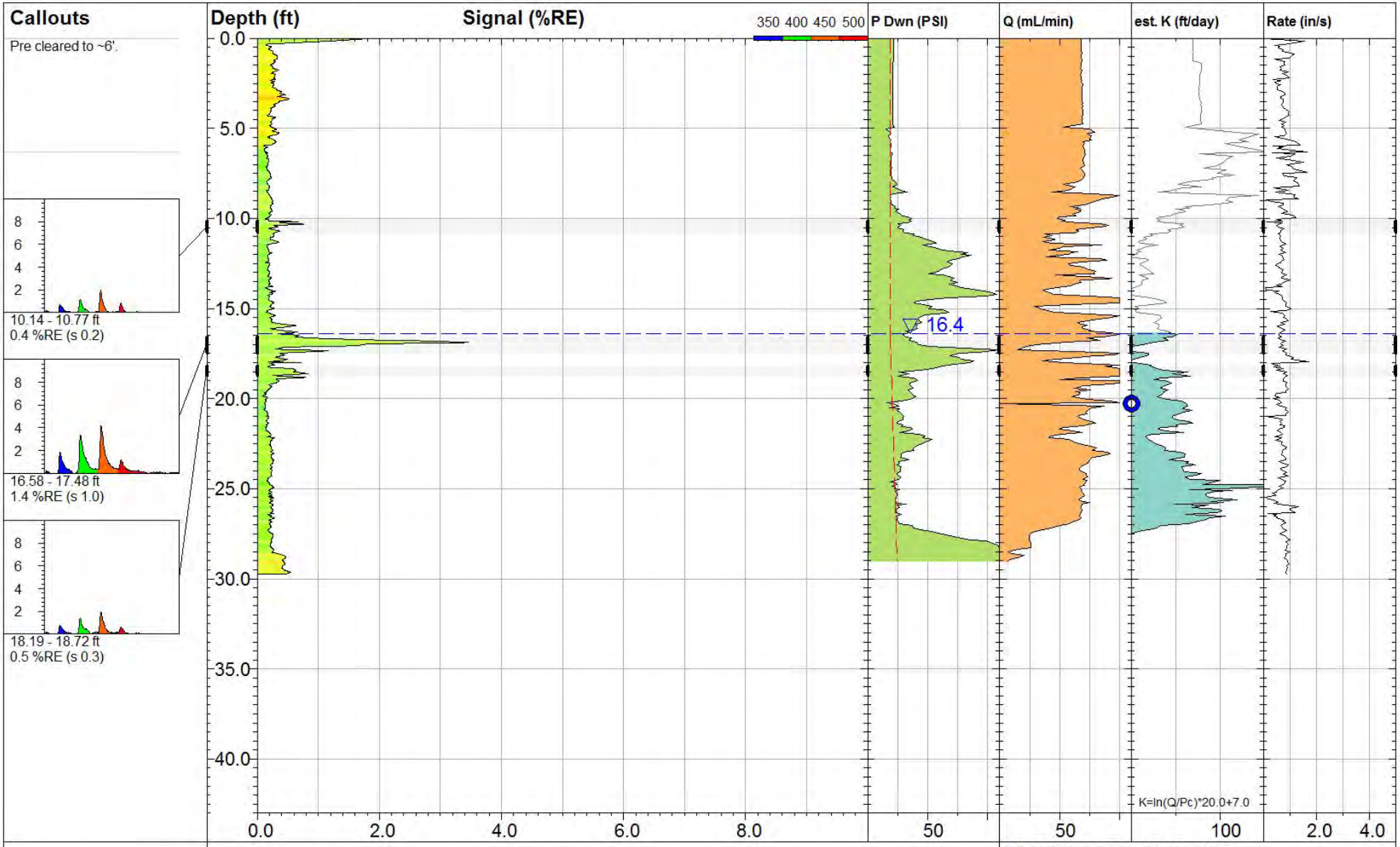
Philadelphia, PA

File Log ID	Date / Time	Pre-Probe *(ft)*	Final Depth *(ft)*	Max Signal *(%RE)*	Max Signal Depth *(ft)*	Initial RE Area *(pVs)*	Background Area *(pVs)*	Stable Dissipation (yes or no)	Calculated Water Table (bgs)	Fluorescence Top - Bottom
UVHP-01	5/14/2019 9:59	6	29.7	4	16.9	12207	10	yes	16.4	10.3' and 15.8-19.0'
UVHP-02	5/14/2019 12:50	5	33.7	3	15.7	12467	29	yes	15.5	15.3-16.6' and 17.7-18.2'
UVHP-03	5/14/2019 14:02	5	30.1	7	16.1	12241	30	yes	16.4	15.5-19.4'
UVHP-04	5/14/2019 15:05	5	29.9	2	19.0	12471	50	yes	16.6	18.7-19.1'
UVHP-05	5/14/2019 16:08	5	30.2	13	13.8	12806	54	yes	14.2	13.2-14.8'
UVHP-06	5/15/2019 9:45	5	29.8	3	17.3	12024	27	yes	17.6	17.0-18.4' and 19.5'
UVHP-07	5/15/2019 10:33	5	34.0	53	19.7	12620	44	yes	19.3	18.6-21.8'
UVHP-08	5/15/2019 12:53	5	33.6	3	18.8	12306	4	no	N/A	18.3-21.0'
UVHP-09	5/15/2019 14:48	5	32.5	165	21.5	12060	77	yes	17.6	17.3-18.0' and 18.7-23.8'
UVHP-10	5/15/2019 17:02	5	33.7	73	20.0	12797	19	yes	16.1	15.5-20.7'
UVHP-11	5/15/2019 16:56	5	33.9	2	16.3	12883	22	yes	15.9	16.2-17.2', 18.1-19.2' and 26.1'
UVHP-12	5/16/2019 8:18	5	33.5	36	11.2	12400	19	yes	11.6	10.9-14.0'
UVHP-13	5/16/2019 9:13	5	15.0	69	10.2	11581	27	yes	10.3	10.0-14.7'
UVHP-14	5/16/2019 10:00	5	41.9	234	14.2	11598	23	yes	13.2	11.7-16.6'
UVHP-15	5/16/2019 11:07	5	34.1	346	20.4	11456	41	yes	20.3	19.2-26.1'
	Total Footage (this sheet)		**475.6**							

(1) Signal response from 0 to 3 feet may not be representative of actual conditions due to pre-probing

Appendix B

UVOST®-HP Logs at 10% RE

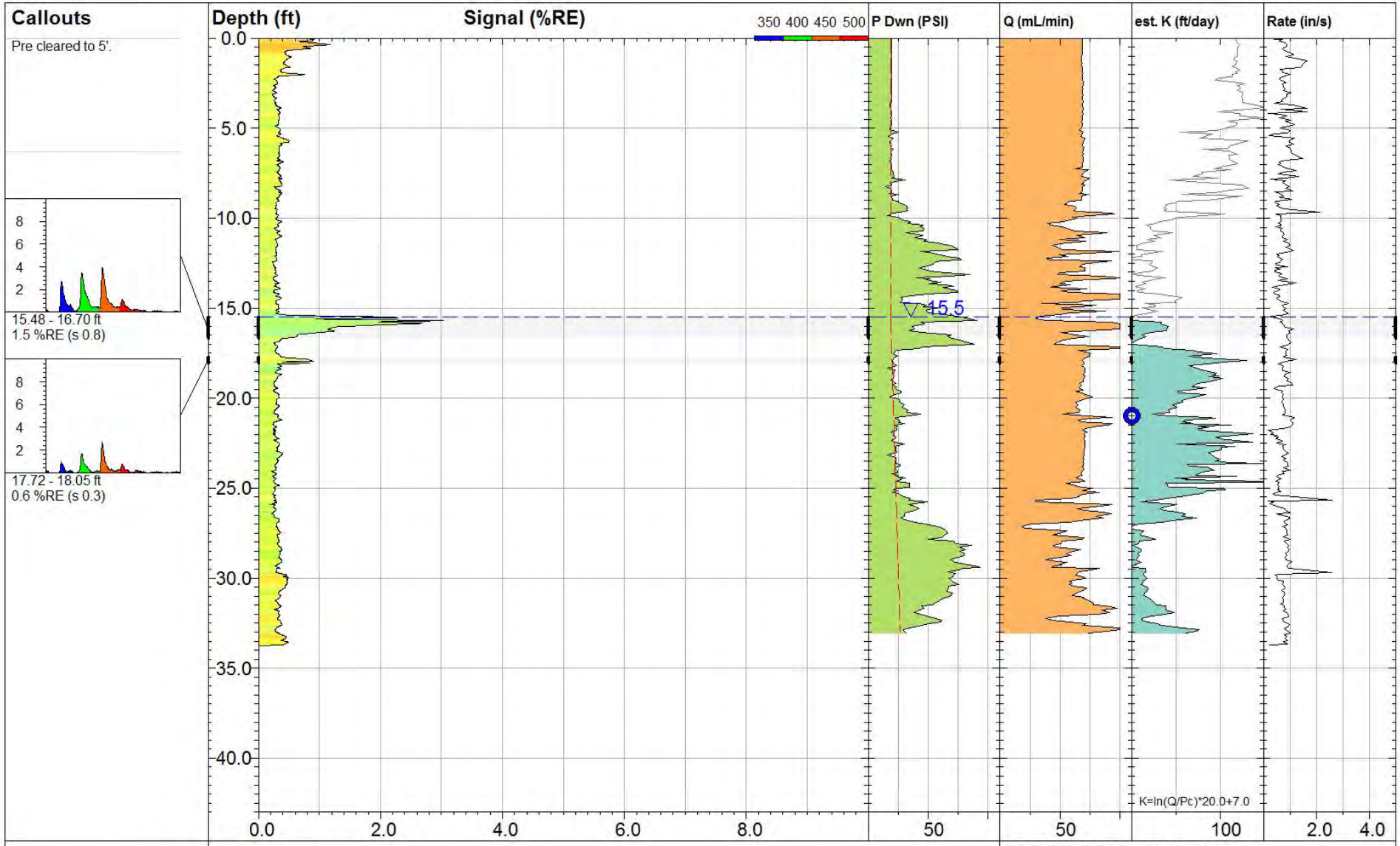


UVHP-01

UVOST® By Dakota
www.DakotaTechnologies.com

DAKOTA TECHNOLOGIES
WWW.DAKOTATECHNOLOGIES.COM

Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **29.74 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **3.5 %RE @ 16.89 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-14 09:59 EDT**

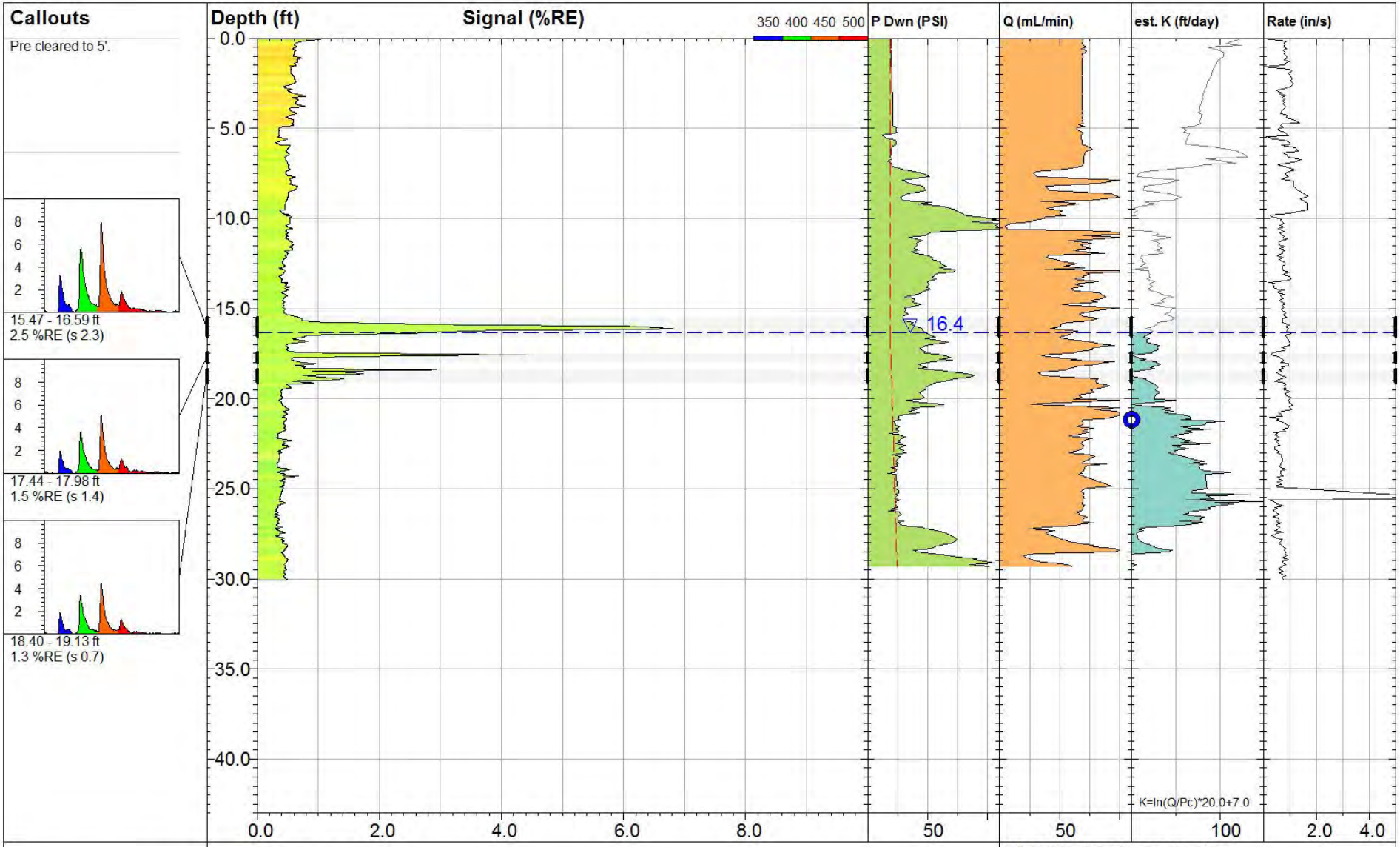


UVHP-02

UVOST® By Dakota
www.DakotaTechnologies.com

Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **33.74 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **3.1 %RE @ 15.69 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-14 12:50 EDT**

DAKOTA TECHNOLOGIES
WWW.DAKOTATECHNOLOGIES.COM

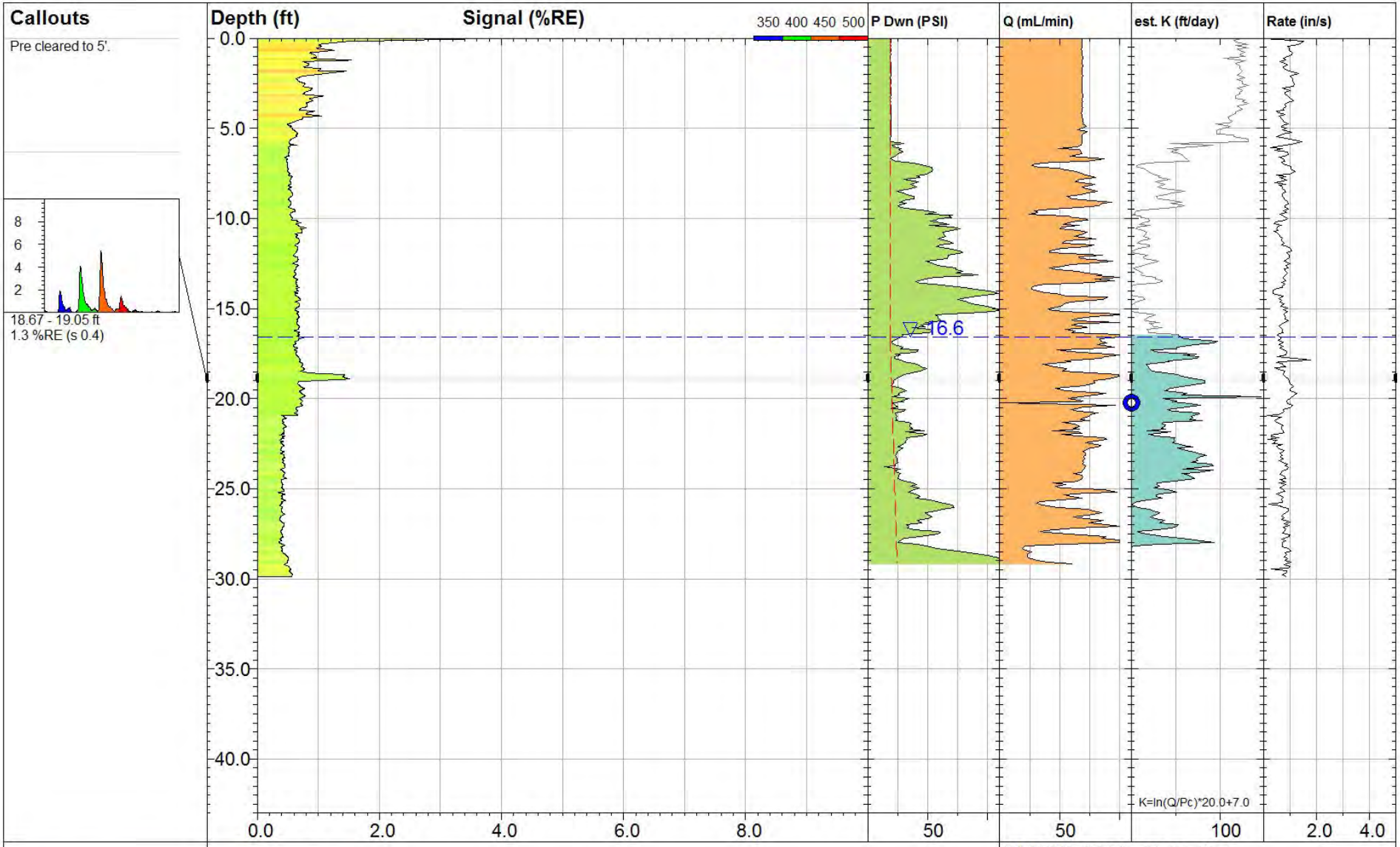


UVHP-03

UVOST® By Dakota
www.DakotaTechnologies.com

DAKOTA TECHNOLOGIES
www.DakotaTechnologies.com

Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **30.07 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **6.8 %RE @ 16.12 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-14 14:02 EDT**

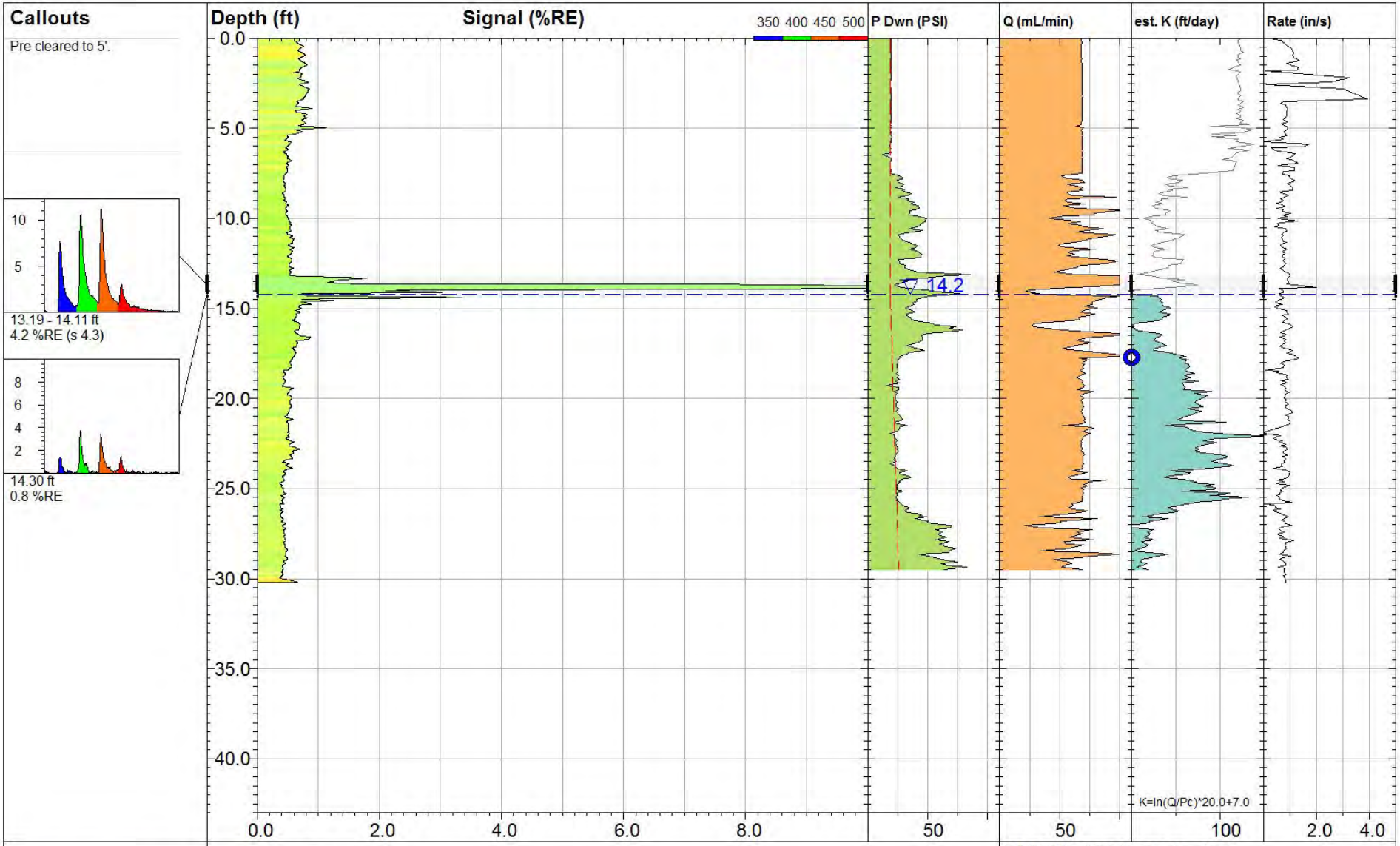


DAKOTA TECHNOLOGIES
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UVHP-04

UVOST® By Dakota
www.DakotaTechnologies.com

Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **29.87 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **4.2 %RE @ 0.00 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-14 15:05 EDT**



UVHP-05

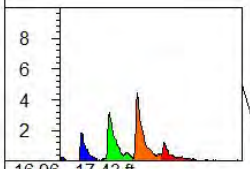
UVOST® By Dakota
www.DakotaTechnologies.com

Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **30.19 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **12.8 %RE @ 13.84 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-14 16:08 EDT**

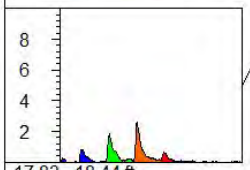
DAKOTA TECHNOLOGIES
WWW.DAKOTATECHNOLOGIES.COM

Callouts

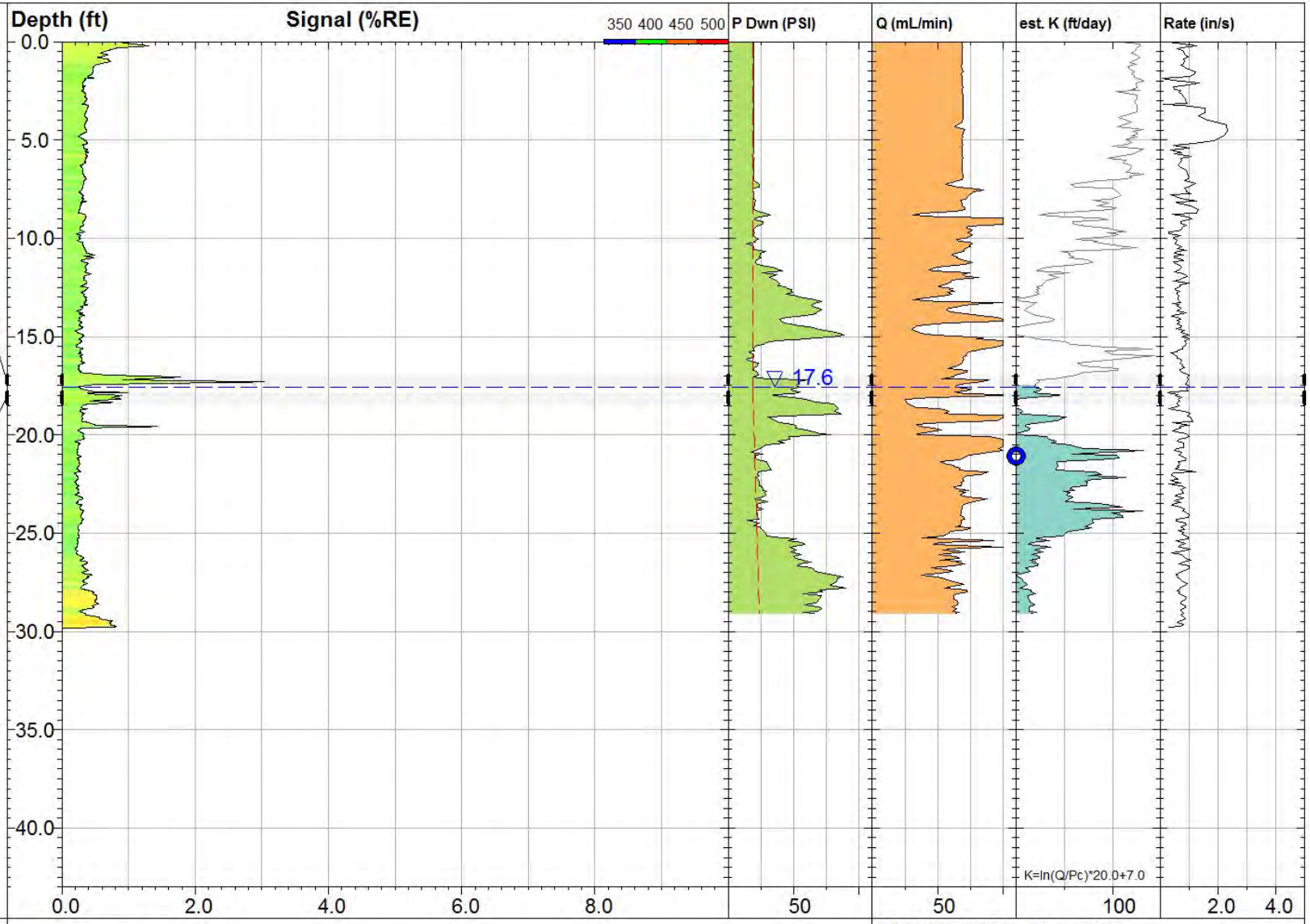
Pre cleared to 5'.



16.96 - 17.43 ft
1.4 %RE (s 1.1)



17.83 - 18.44 ft
0.6 %RE (s 0.2)



DAKOTA TECHNOLOGIES

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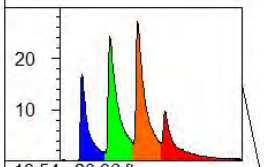
UVHP-06

UVOST® By Dakota
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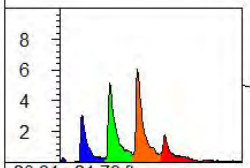
Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **29.80 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **3.1 %RE @ 17.30 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-15 09:45 EDT**

Callouts

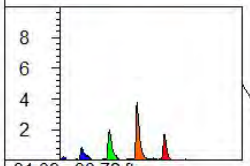
Pre cleared to 6'.



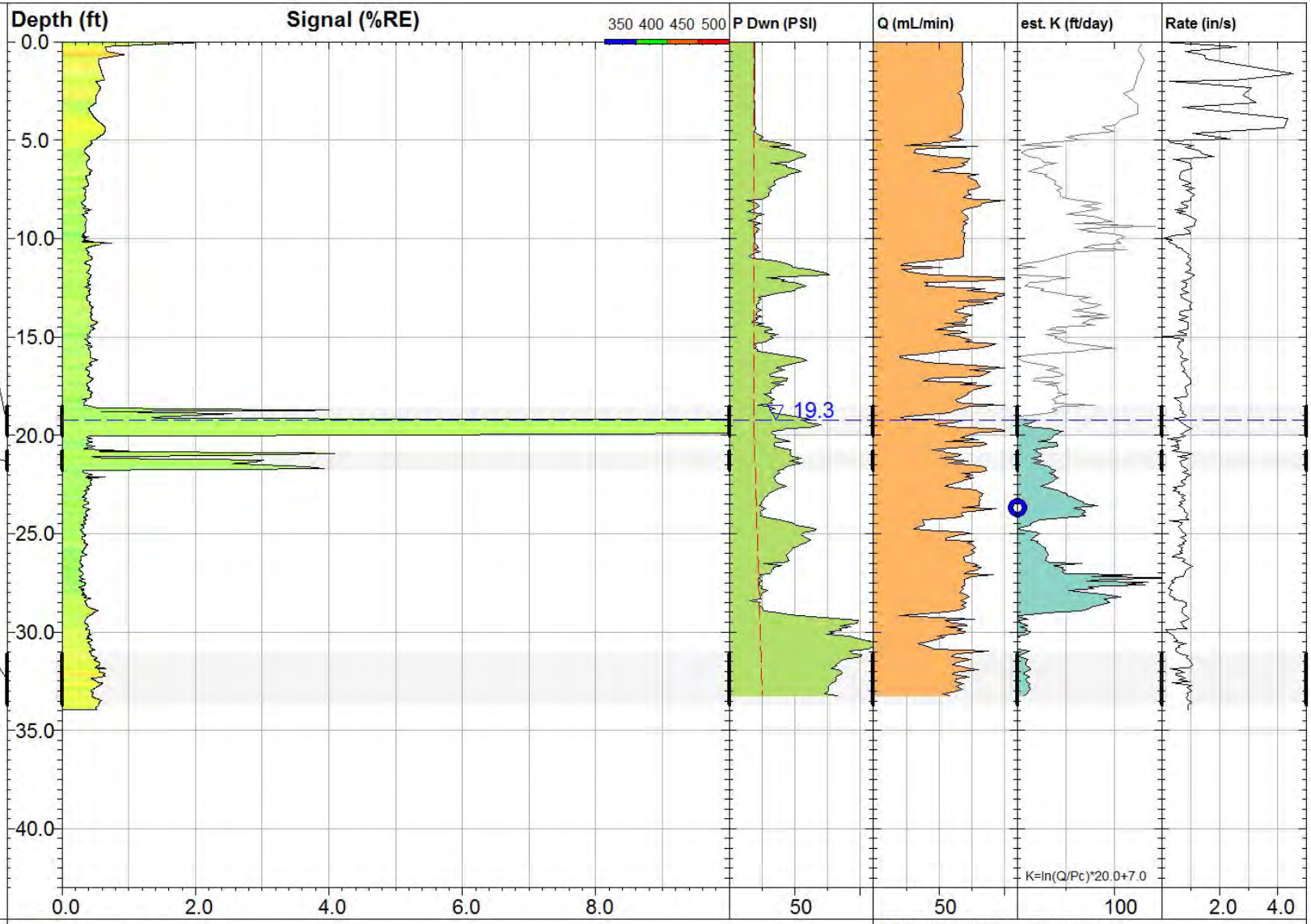
18.54 - 20.06 ft
12.3 %RE (s 15.6)



20.81 - 21.78 ft
2.1 %RE (s 1.4)



31.09 - 33.72 ft
0.5 %RE (s 0.1)
cracked window
wiindow was cracked durin boring

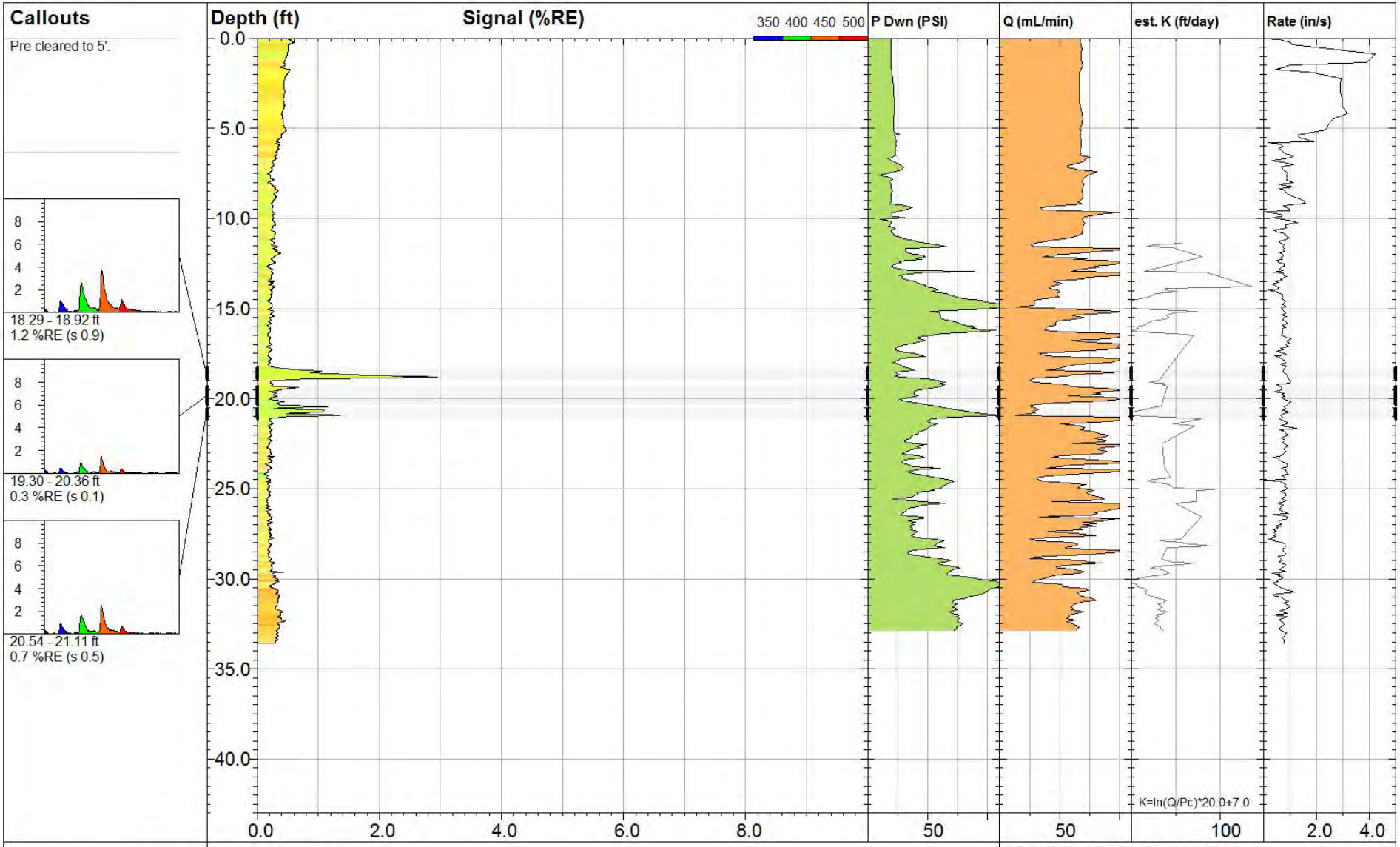


UVHP-07

UVOST® By Dakota
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Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **33.96 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **53.2 %RE @ 19.67 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-15 10:33 EDT**

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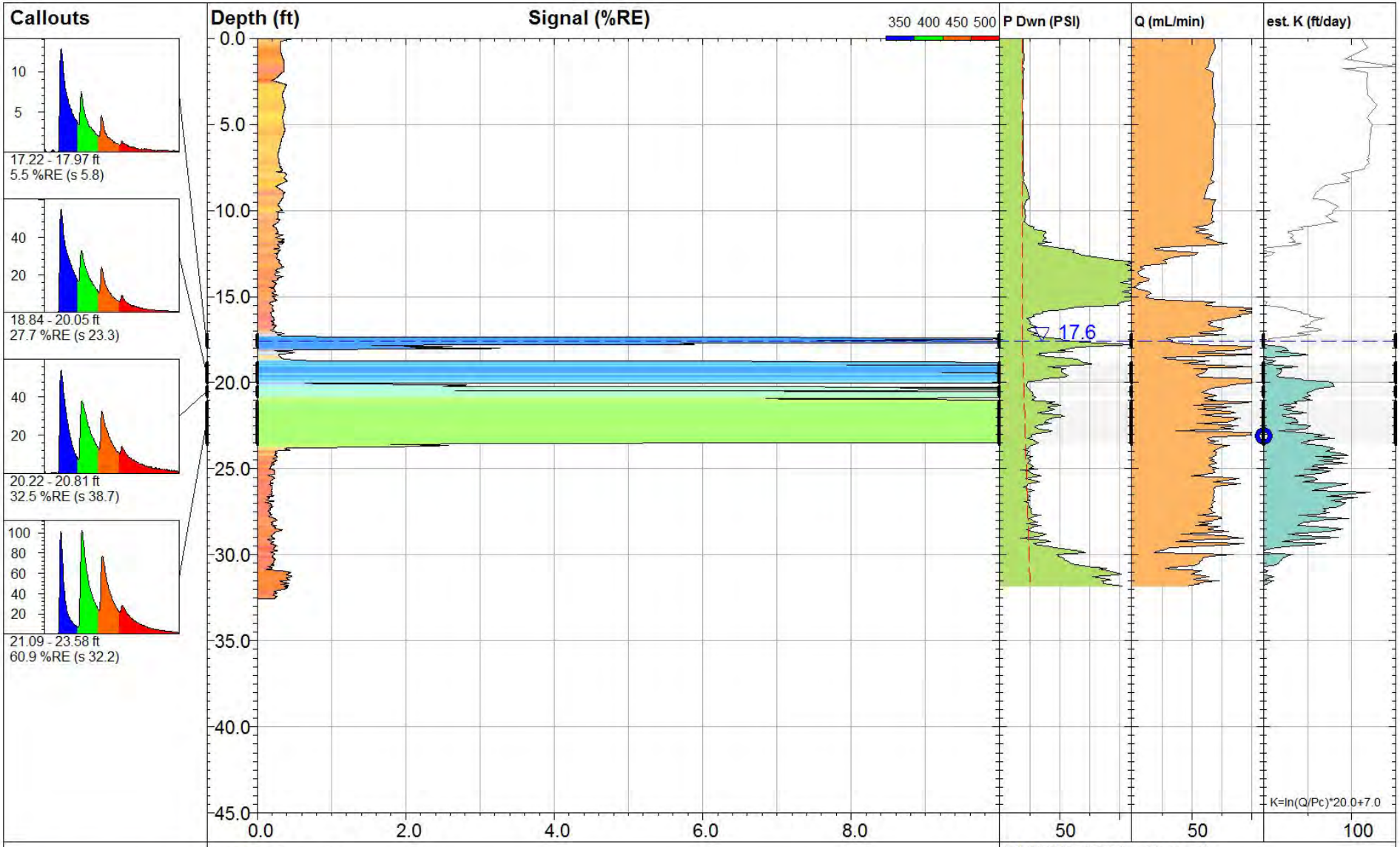


UVHP-08

UVOST® By Dakota
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Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **33.57 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **3.0 %RE @ 18.80 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-15 12:53 EDT**

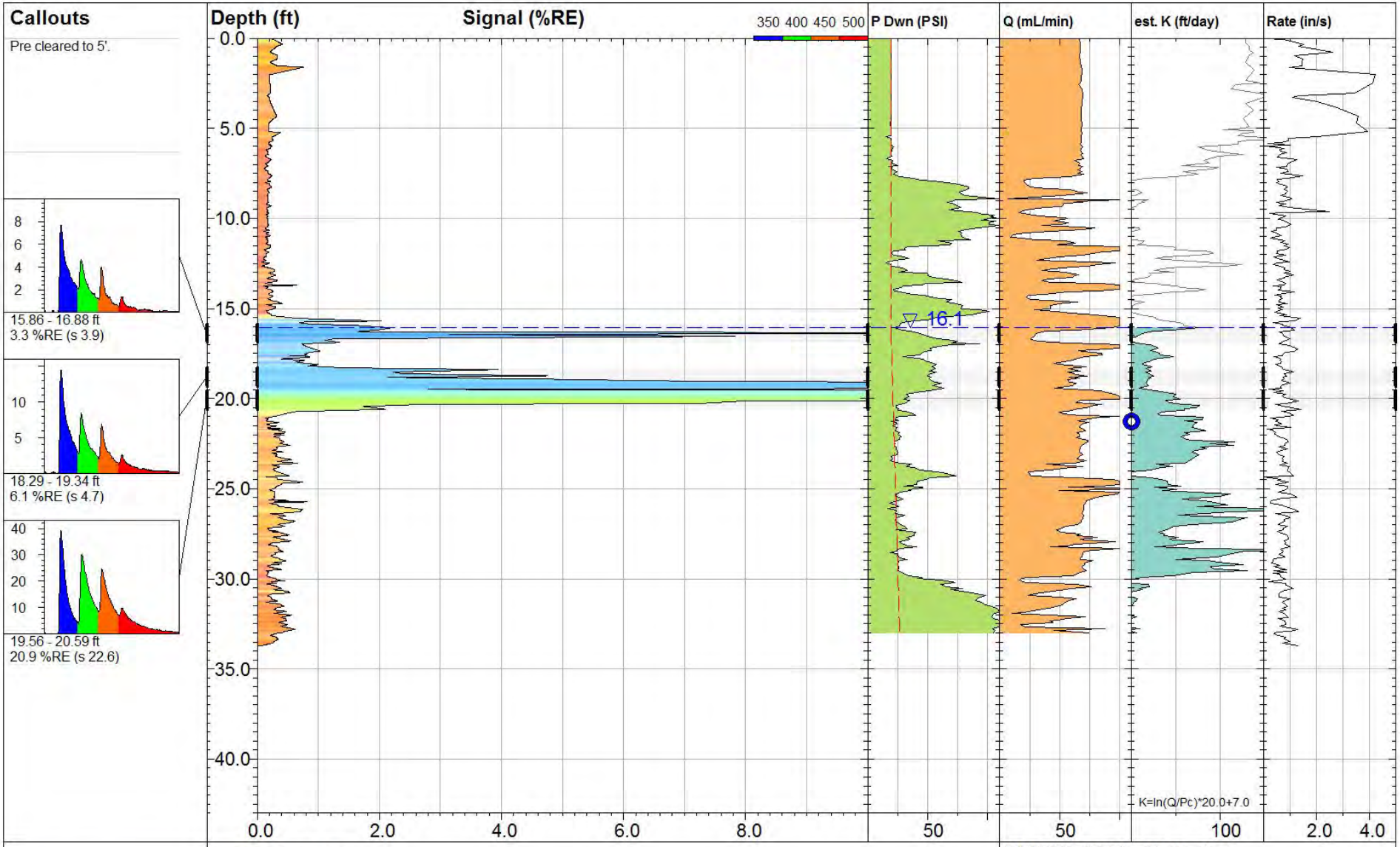


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UVHP-09

UVOST® By Dakota
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Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **32.54 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **164.9 %RE @ 21.48 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-15 14:48 EDT**

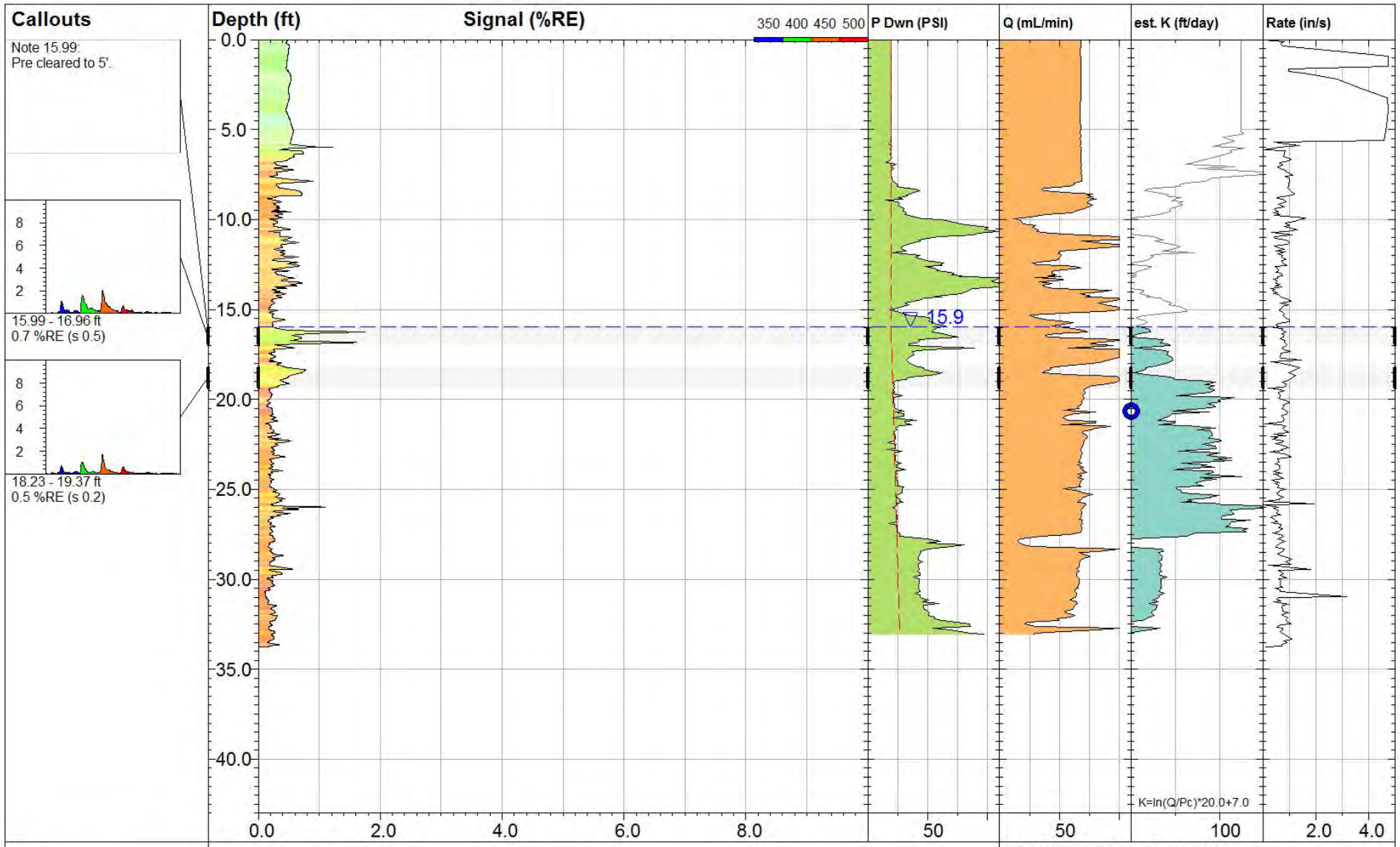


UVHP-10

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Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **33.69 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **73.1 %RE @ 19.96 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-15 17:02 EDT**

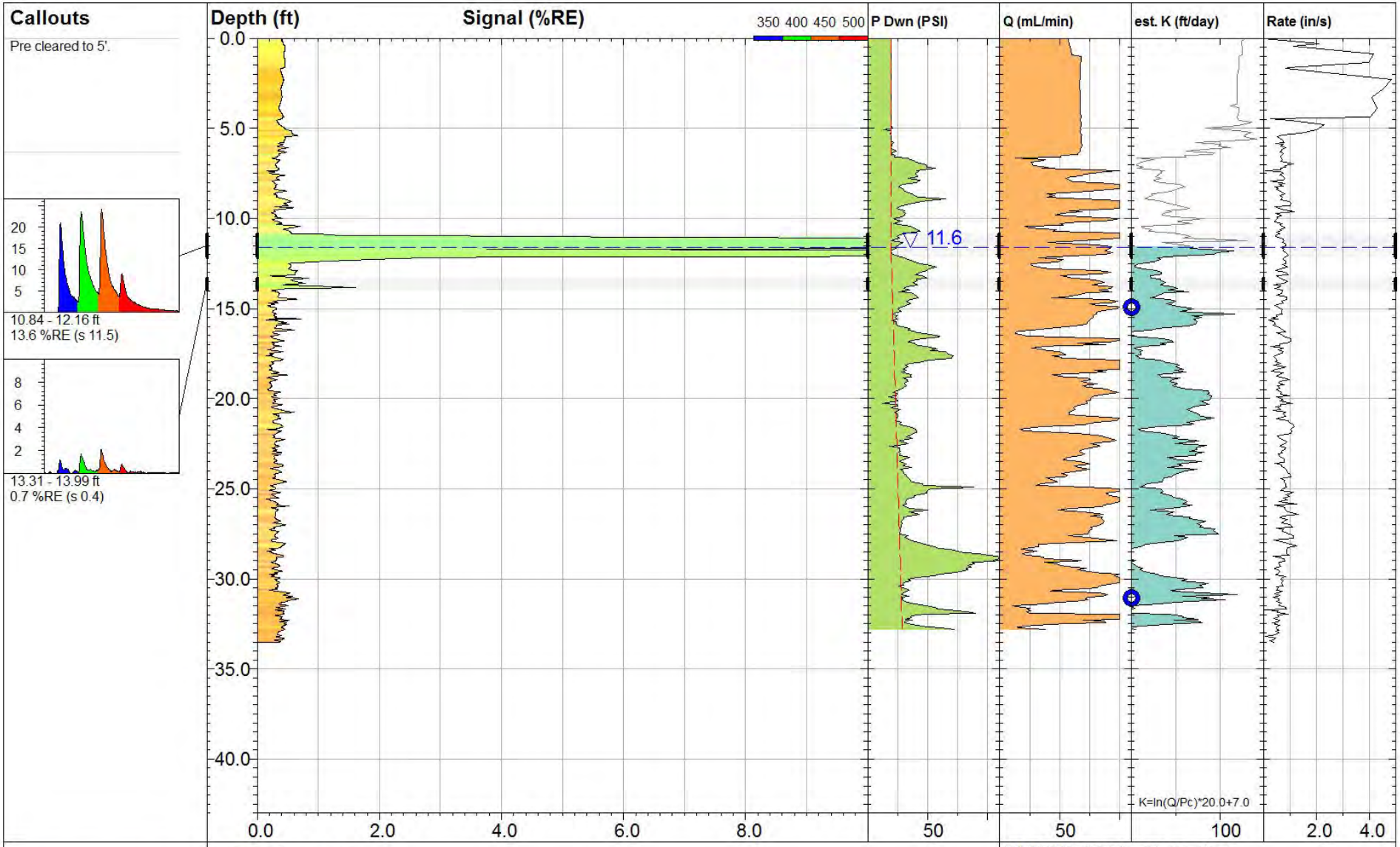


UVHP-11

UVOST® By Dakota
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Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **33.77 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **1.8 %RE @ 16.25 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-15 17:56 EDT**

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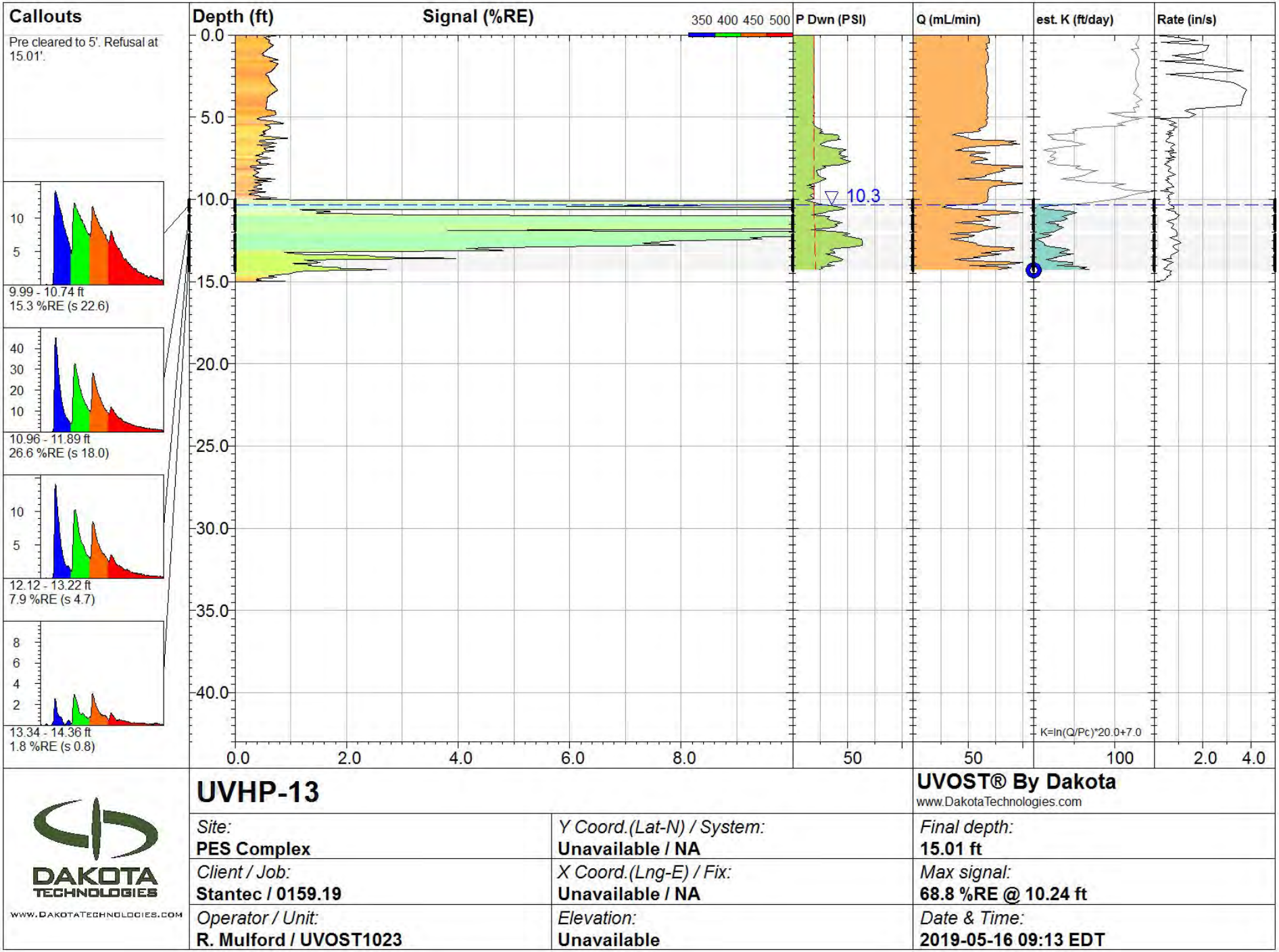


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UVHP-12

UVOST® By Dakota
www.DakotaTechnologies.com

Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **33.52 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **35.8 %RE @ 11.15 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-16 08:18 EDT**

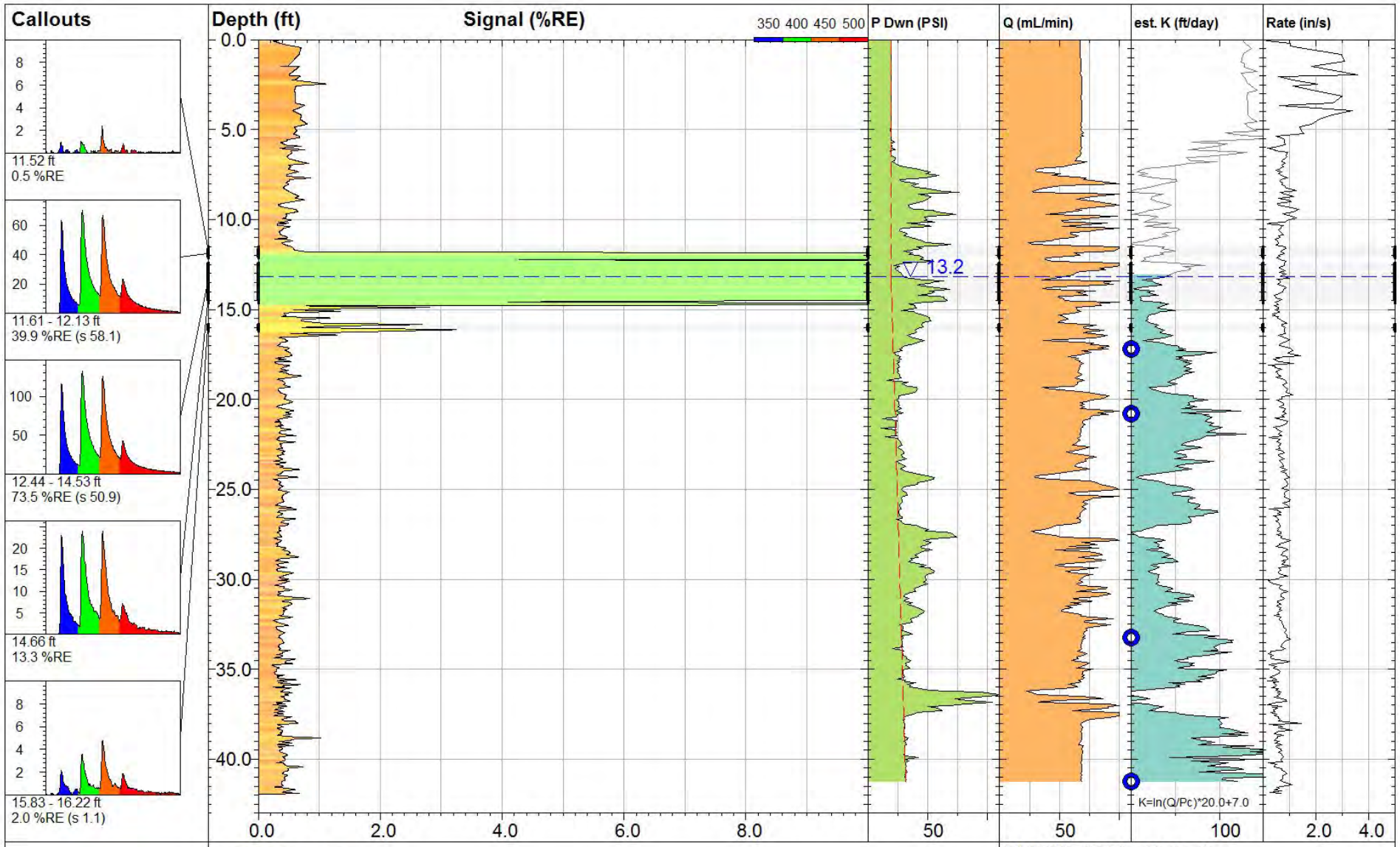


UVHP-13

UVOST® By Dakota
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Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **15.01 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **68.8 %RE @ 10.24 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-16 09:13 EDT**

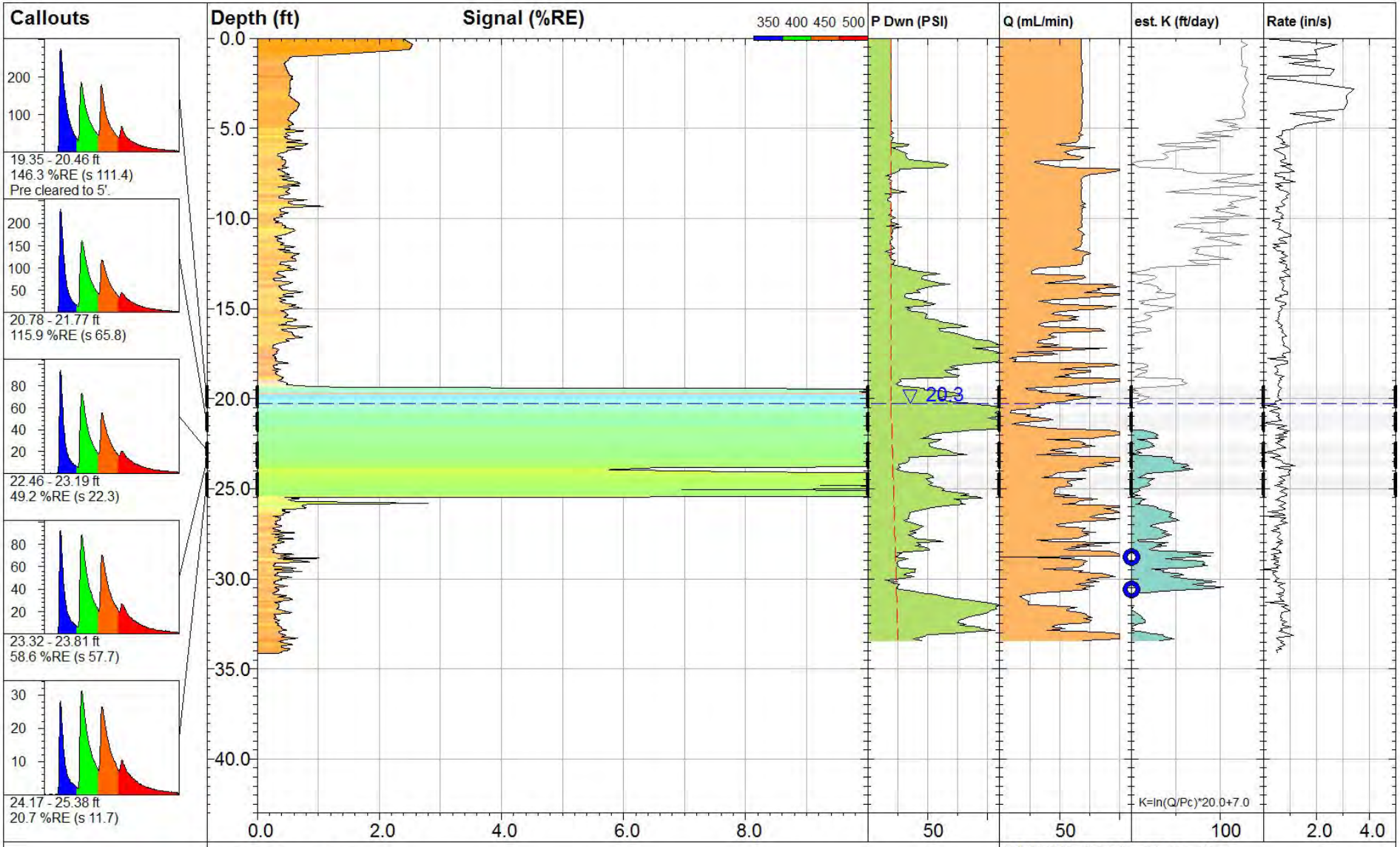


UVHP-14

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Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **41.94 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **233.5 %RE @ 14.23 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-16 10:00 EDT**



UVHP-15

UVOST® By Dakota
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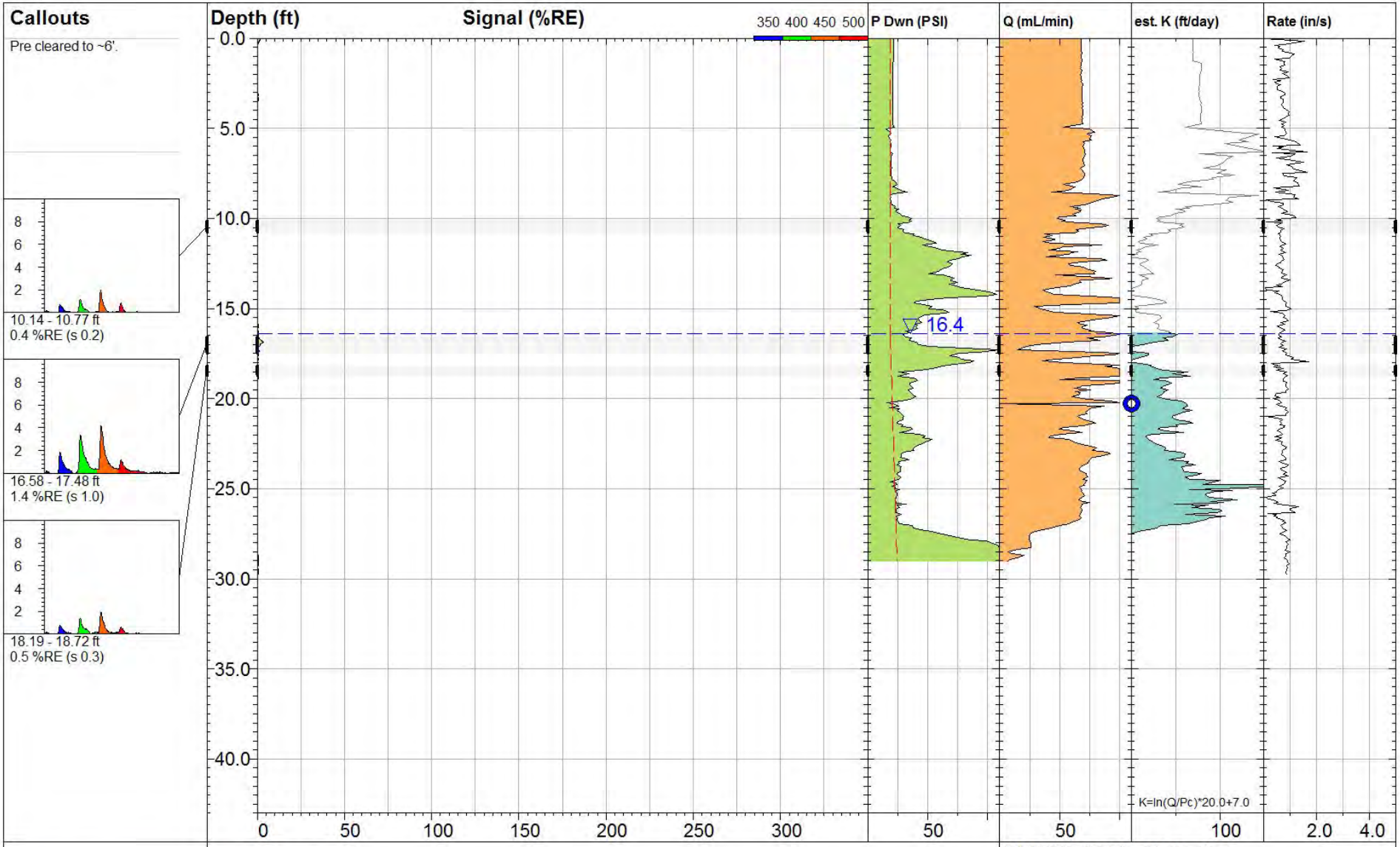
DAKOTA TECHNOLOGIES
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Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **34.12 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **346.1 %RE @ 20.36 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-16 11:07 EDT**

Appendix C

UVOST®-HP Logs 350 % RE

DAKOTA TECHNOLOGIES

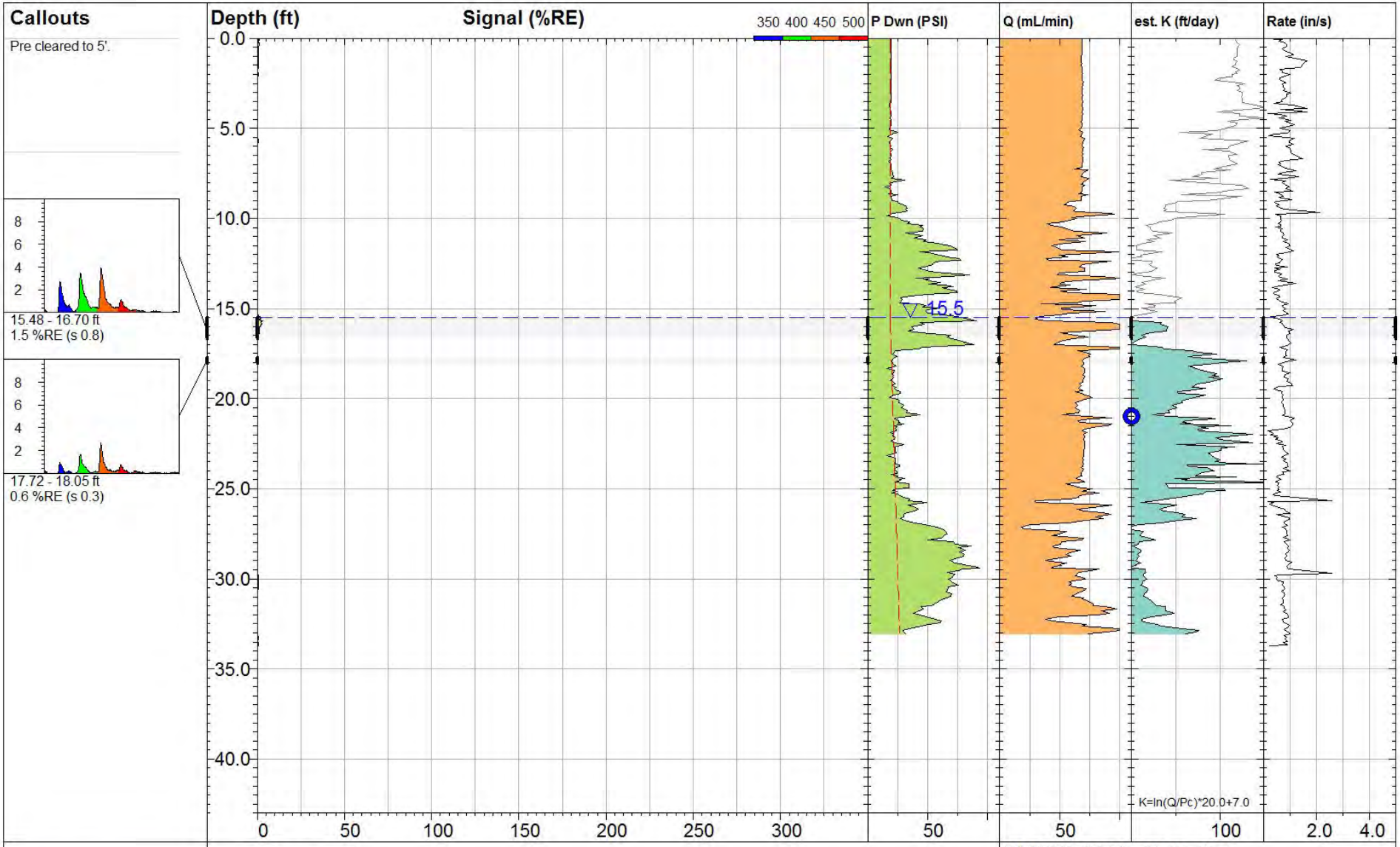


UVHP-01

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Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **29.74 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **3.5 %RE @ 16.89 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-14 09:59 EDT**

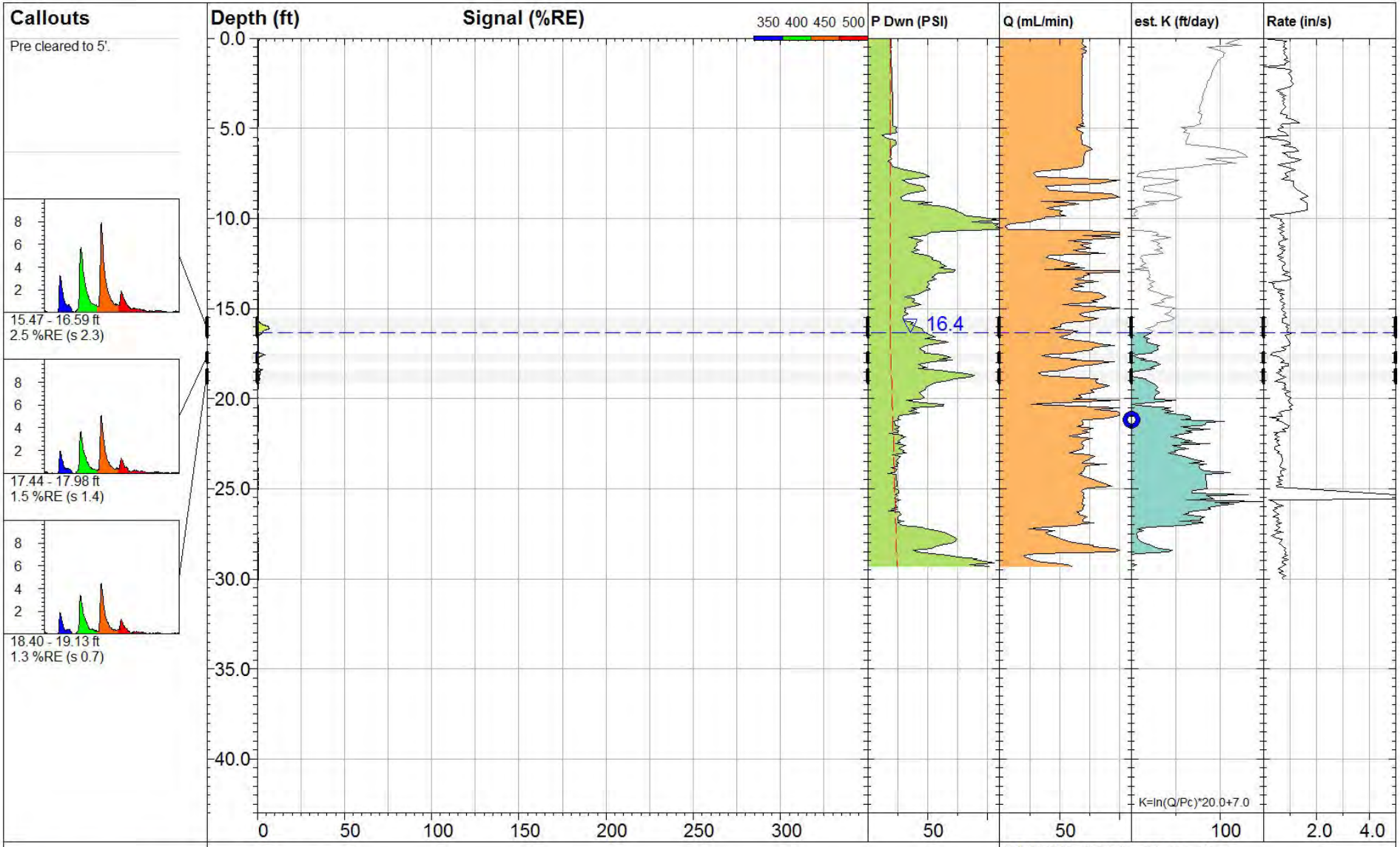


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UVHP-02

UVOST® By Dakota
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Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **33.74 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **3.1 %RE @ 15.69 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-14 12:50 EDT**



UVHP-03

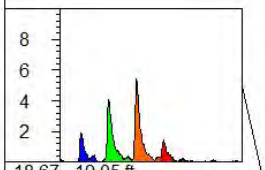
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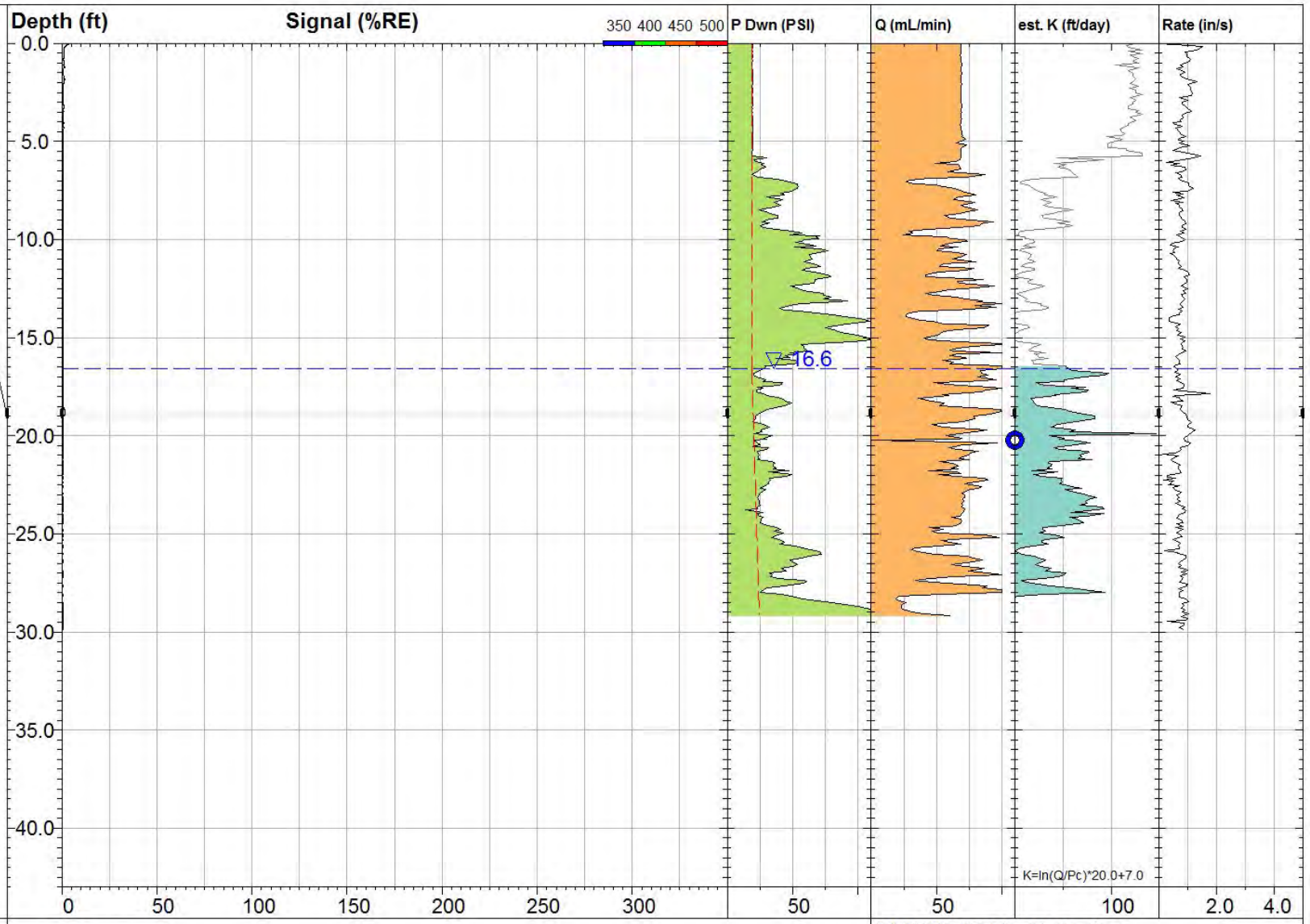
Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **30.07 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **6.8 %RE @ 16.12 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-14 14:02 EDT**

Callouts

Pre cleared to 5'.



18.67 - 19.05 ft
1.3 %RE (s 0.4)

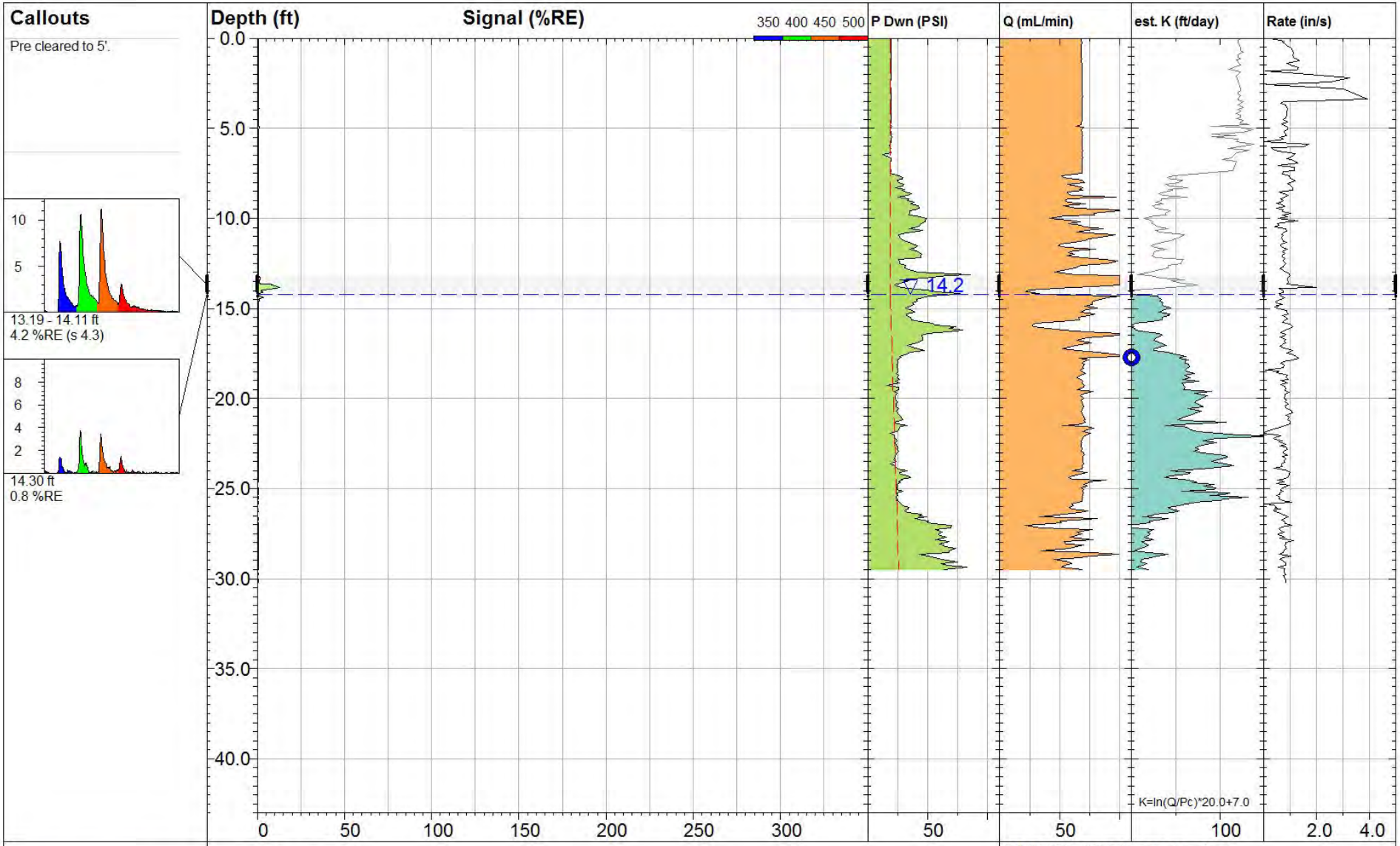


UVHP-04

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Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **29.87 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **4.2 %RE @ 0.00 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-14 15:05 EDT**

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UVHP-05

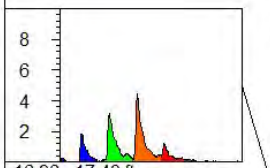
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Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **30.19 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **12.8 %RE @ 13.84 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-14 16:08 EDT**

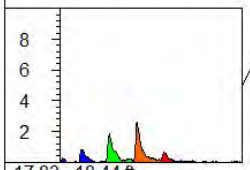
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Callouts

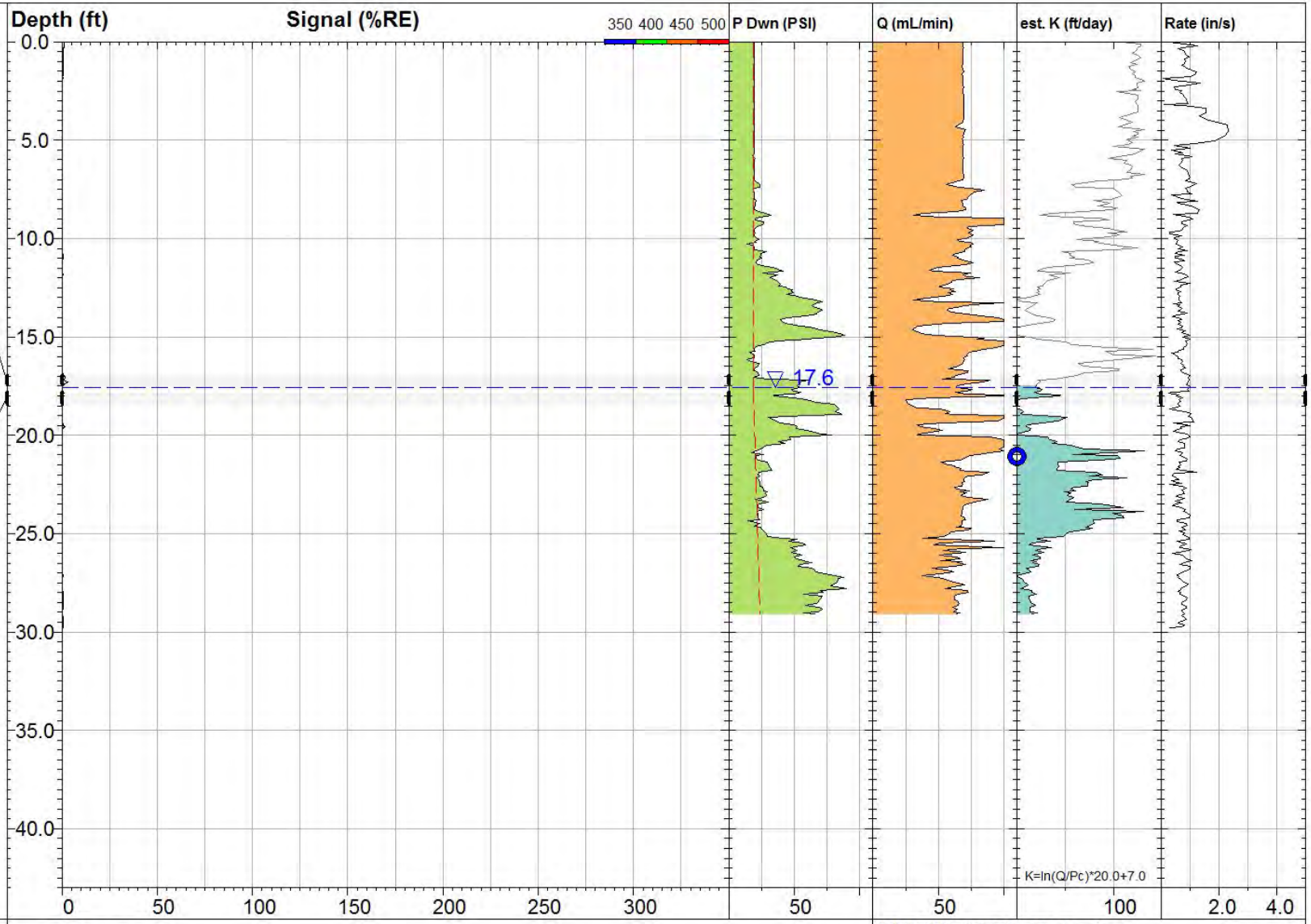
Pre cleared to 5'.



16.96 - 17.43 ft
1.4 %RE (s 1.1)



17.83 - 18.44 ft
0.6 %RE (s 0.2)



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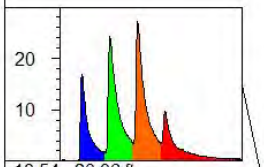
UVHP-06

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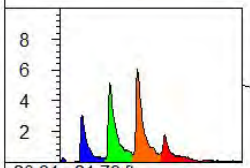
Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **29.80 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **3.1 %RE @ 17.30 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-15 09:45 EDT**

Callouts

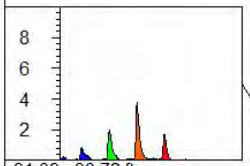
Pre cleared to 6'.



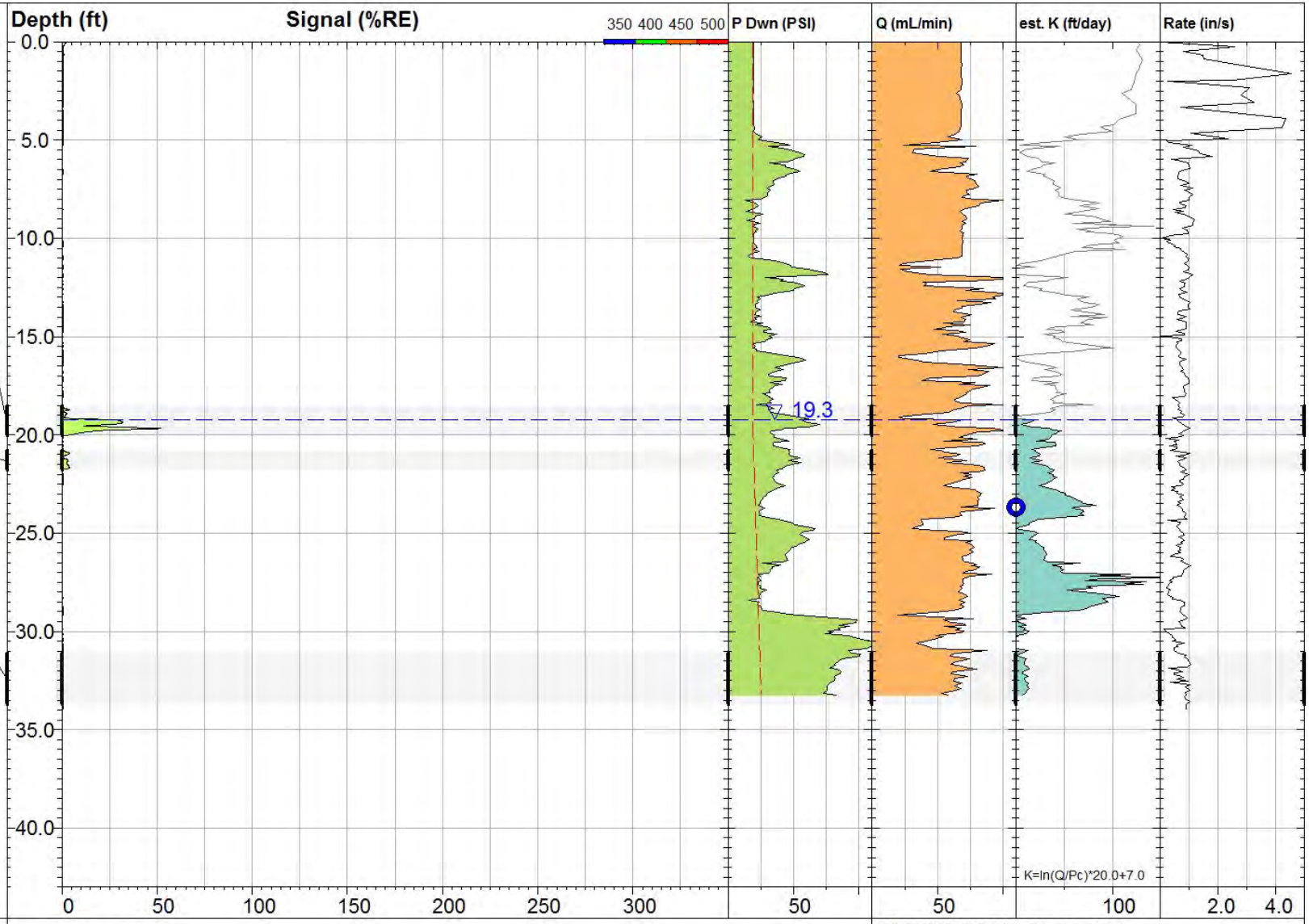
18.54 - 20.06 ft
12.3 %RE (s 15.6)



20.81 - 21.78 ft
2.1 %RE (s 1.4)



31.09 - 33.72 ft
0.5 %RE (s 0.1)
cracked window
wiindow was cracked durin boring

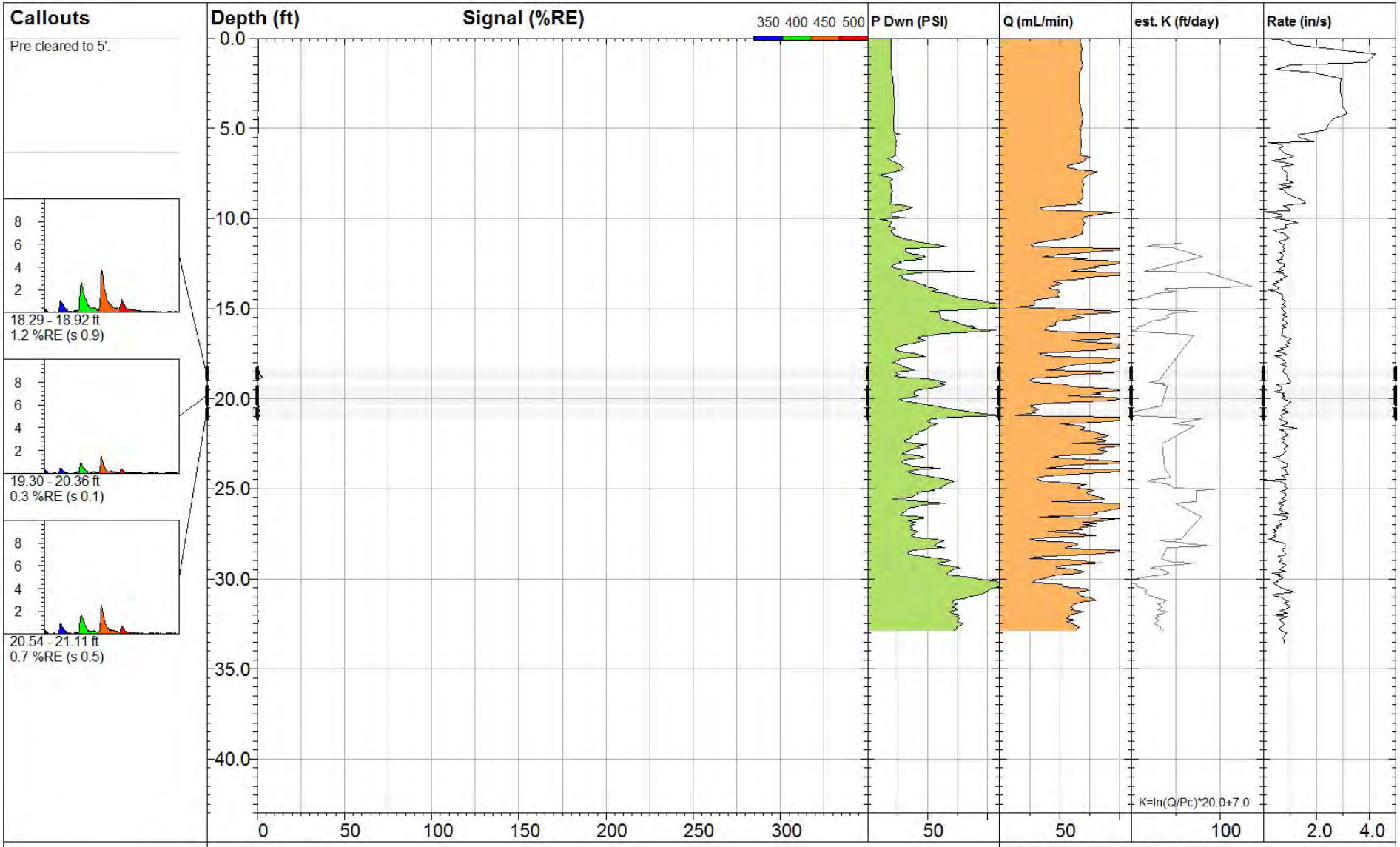


UVHP-07

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Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **33.96 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **53.2 %RE @ 19.67 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-15 10:33 EDT**

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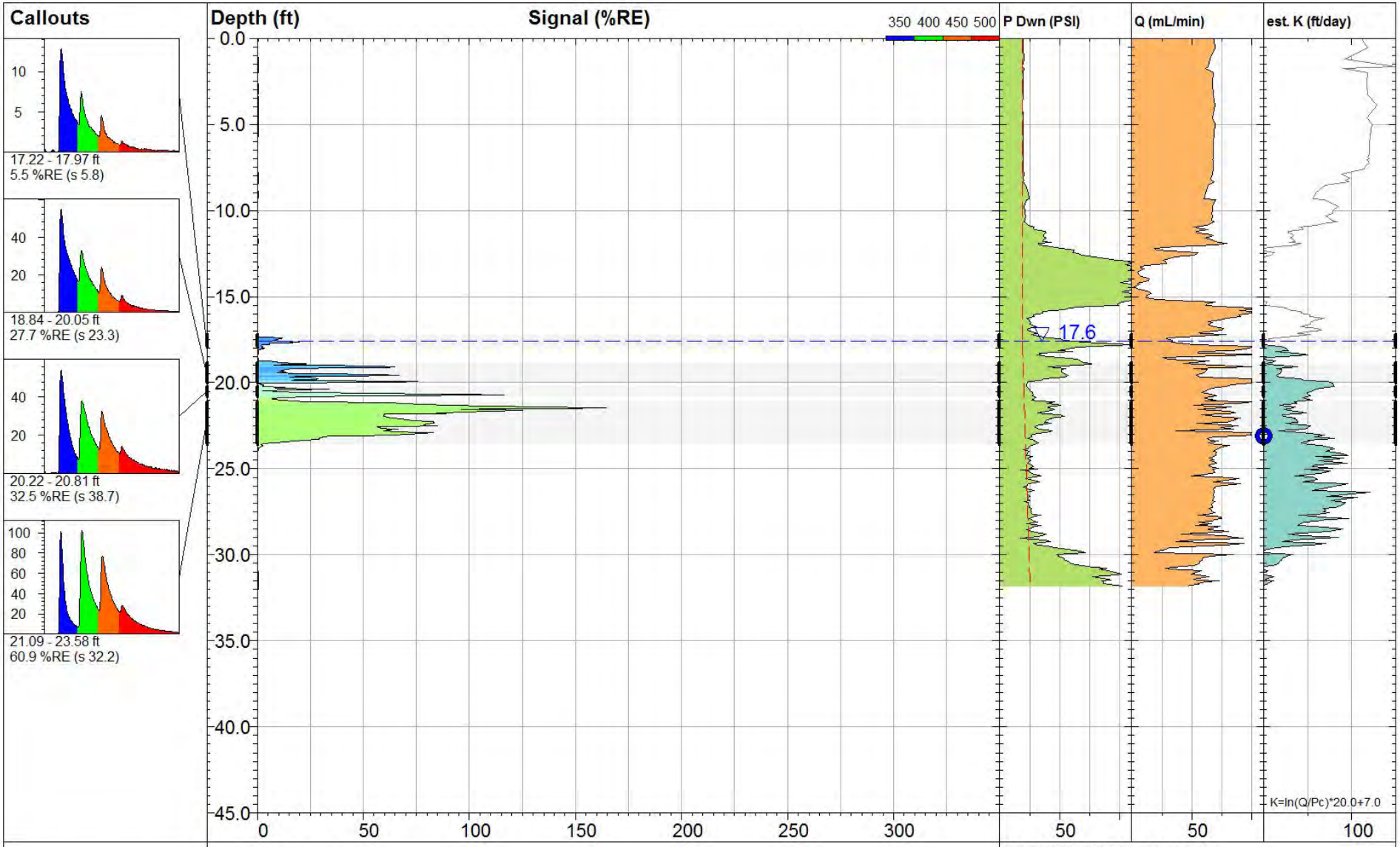


UVHP-08

UVOST® By Dakota
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DAKOTA TECHNOLOGIES
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Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **33.57 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **3.0 %RE @ 18.80 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-15 12:53 EDT**

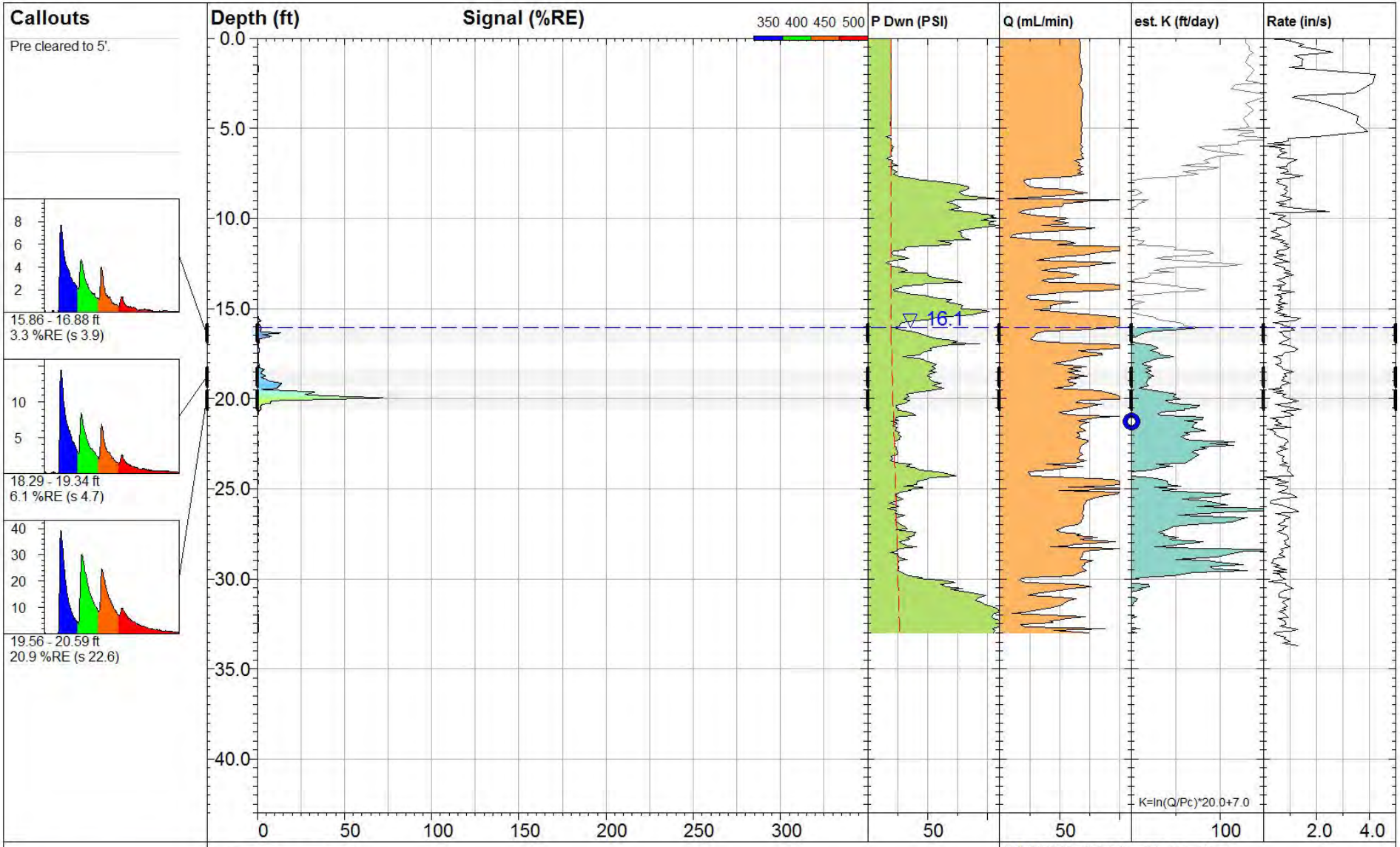


UVHP-09

UVOST® By Dakota
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DAKOTA TECHNOLOGIES
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Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **32.54 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **164.9 %RE @ 21.48 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-15 14:48 EDT**

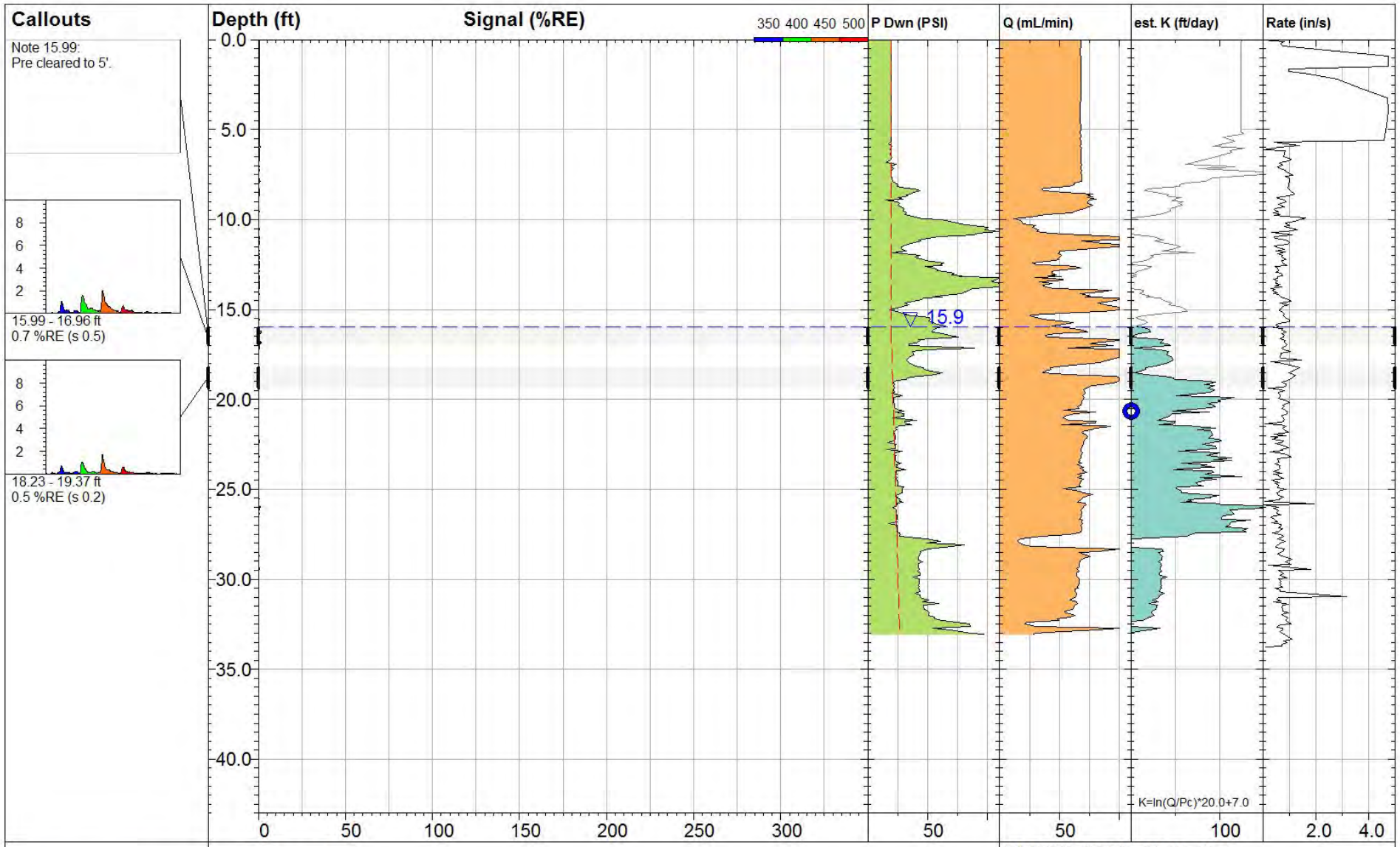


UVHP-10

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Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **33.69 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **73.1 %RE @ 19.96 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-15 17:02 EDT**

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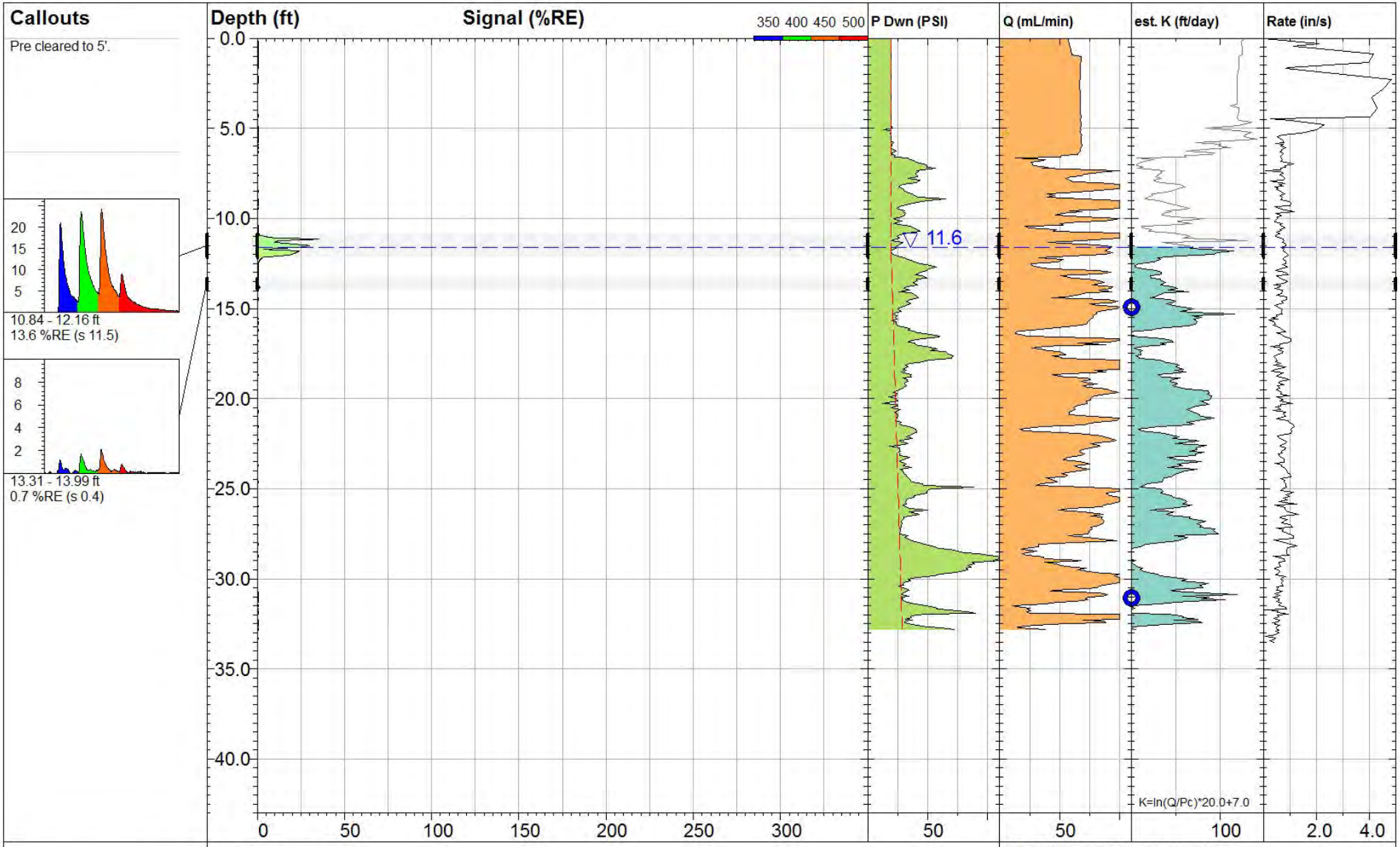


UVHP-11

UVOST® By Dakota
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Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **33.77 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **1.8 %RE @ 16.25 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-15 17:56 EDT**

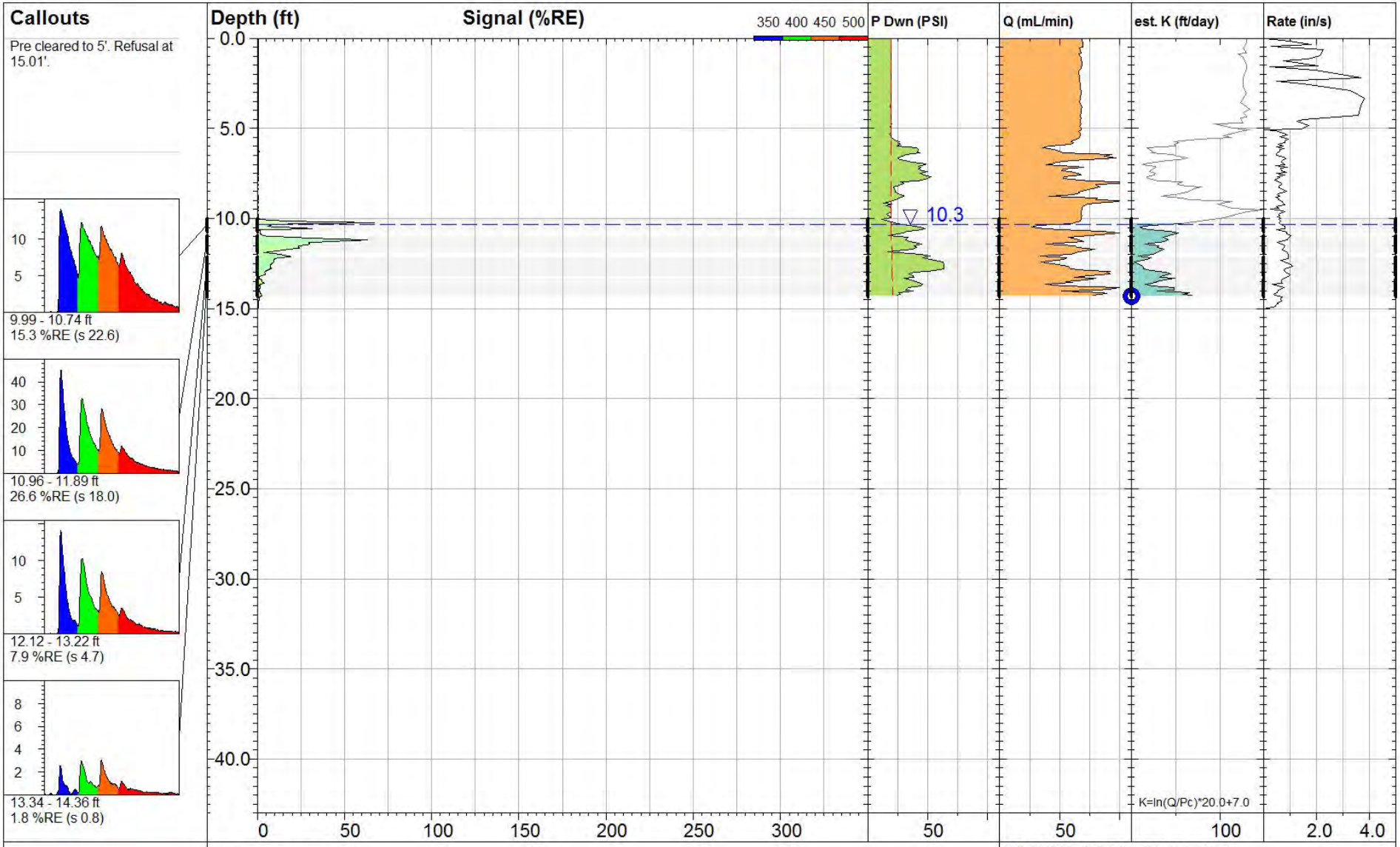


UVHP-12

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DAKOTA TECHNOLOGIES
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Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **33.52 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **35.8 %RE @ 11.15 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-16 08:18 EDT**

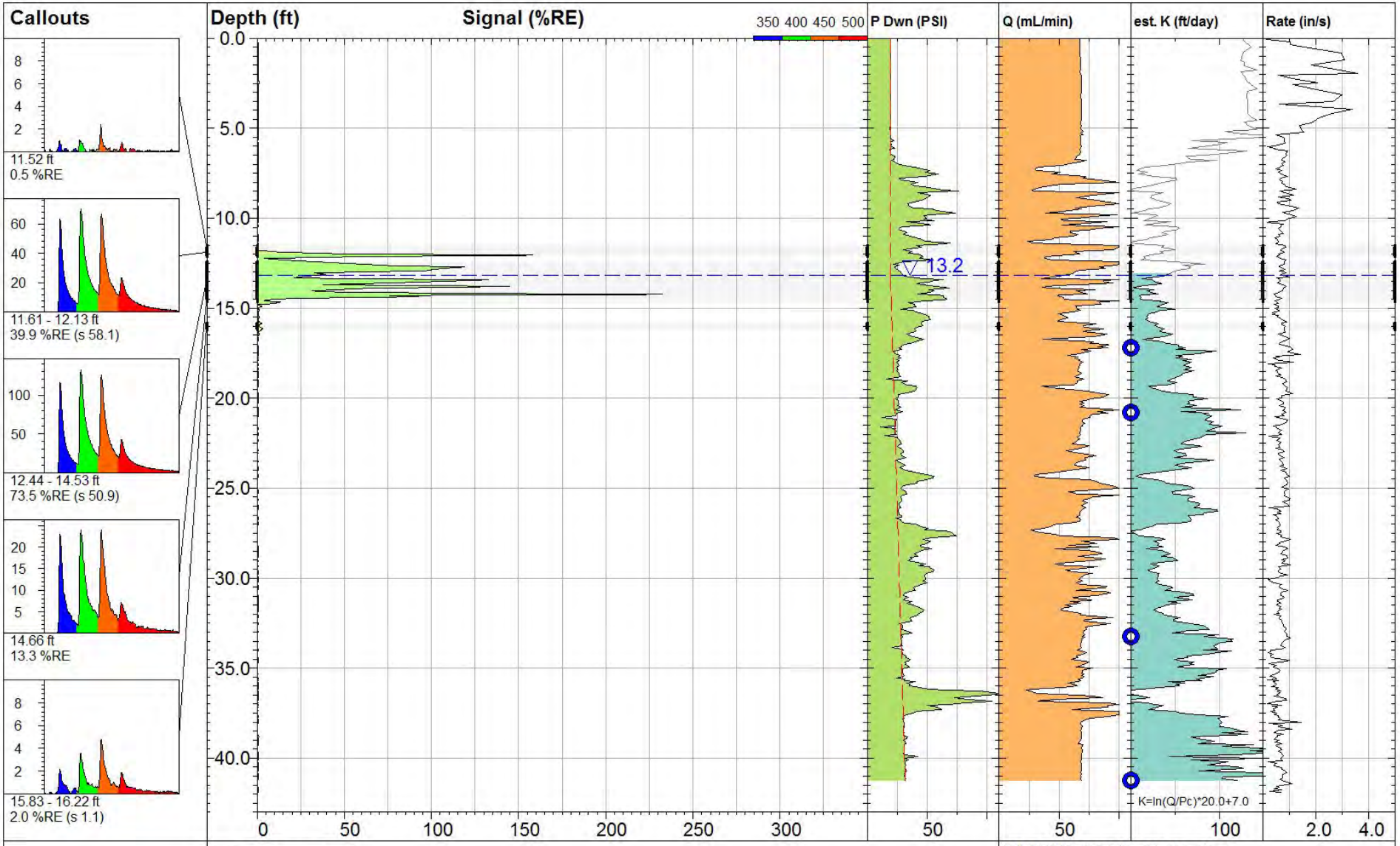


UVHP-13

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DAKOTA TECHNOLOGIES
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Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **15.01 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **68.8 %RE @ 10.24 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-16 09:13 EDT**

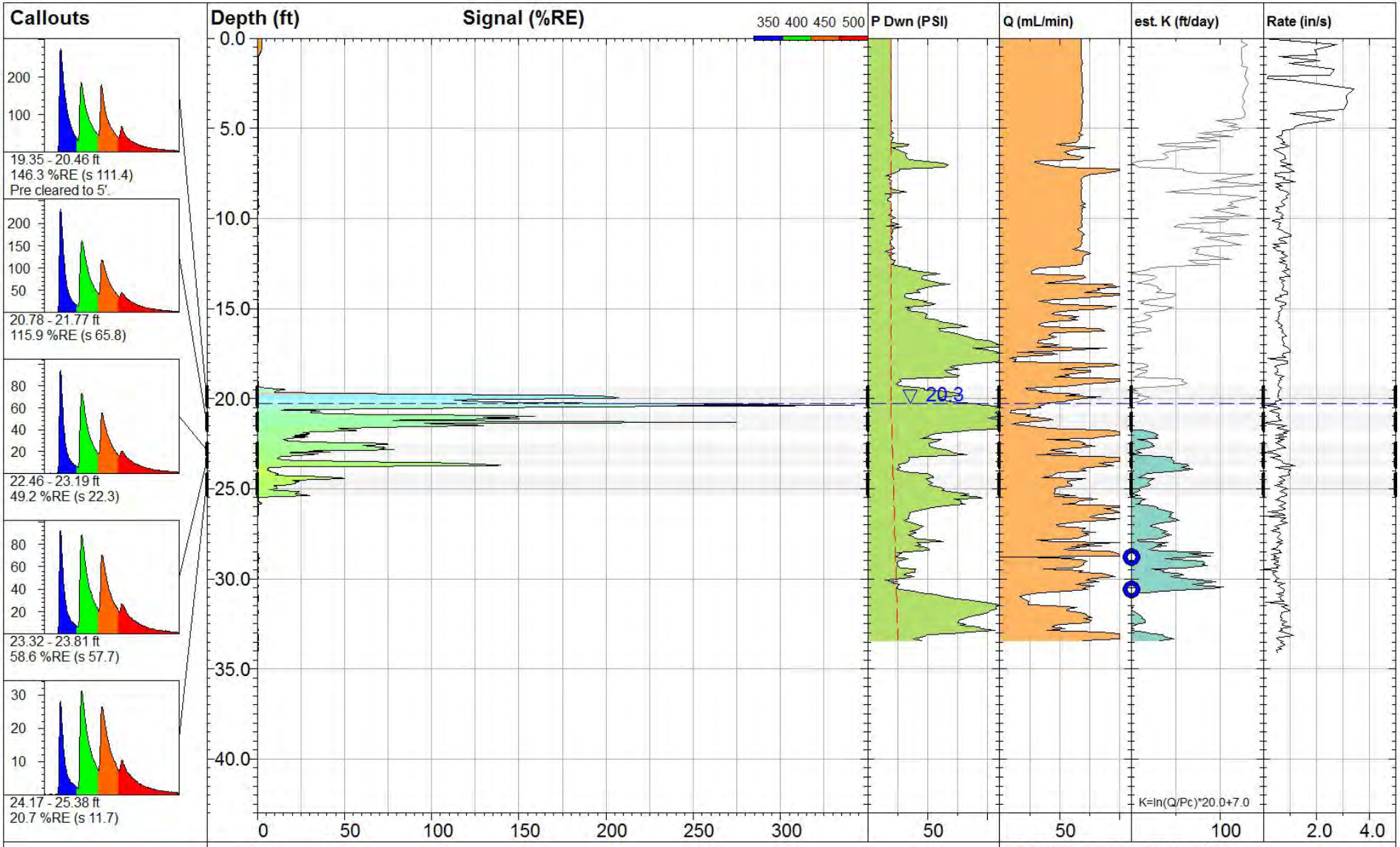


UVHP-14

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Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **41.94 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **233.5 %RE @ 14.23 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-16 10:00 EDT**



UVHP-15

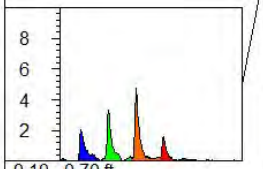
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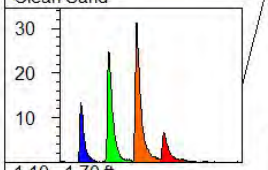
Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **34.12 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **346.1 %RE @ 20.36 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-16 11:07 EDT**

Callouts

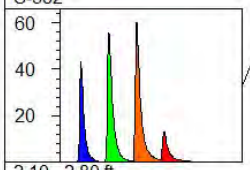
Prodeuct taken from wells and holding tanks dripped on to clean sand



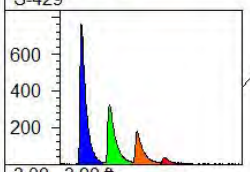
0.10 - 0.70 ft
1.1 %RE (s 0.1)
Clean Sand



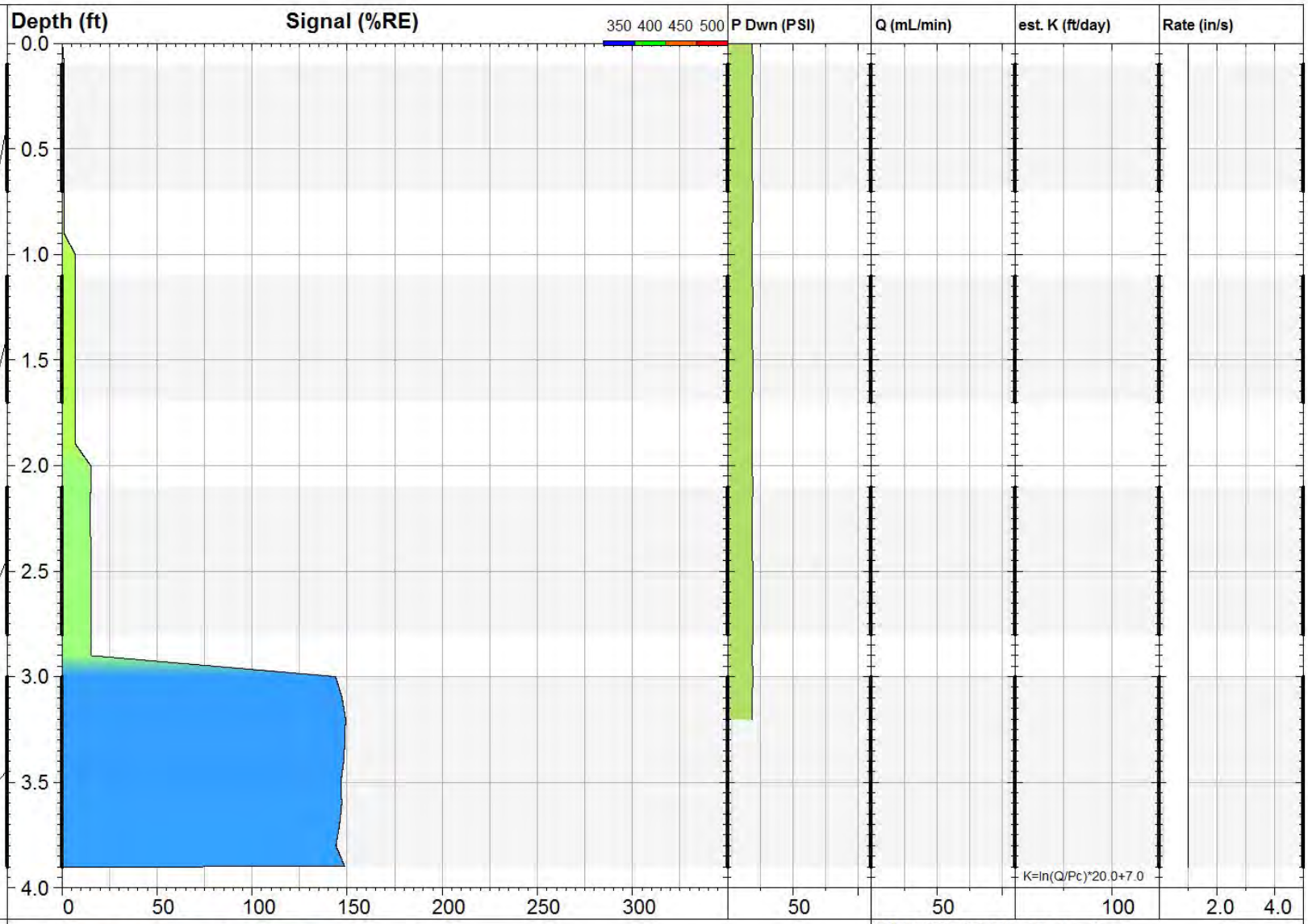
1.10 - 1.70 ft
7.1 %RE (s 0.1)
S-382



2.10 - 2.80 ft
15.2 %RE (s 0.2)
S-429



3.00 - 3.90 ft
147.0 %RE (s 1.9)
S-283



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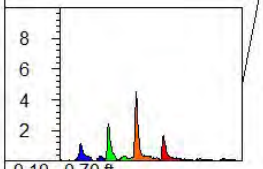
Emulation Product in Holding Tanks

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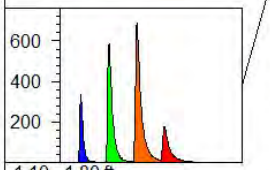
Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **3.90 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **149.1 %RE @ 3.20 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-14 11:14 EDT**

Callouts

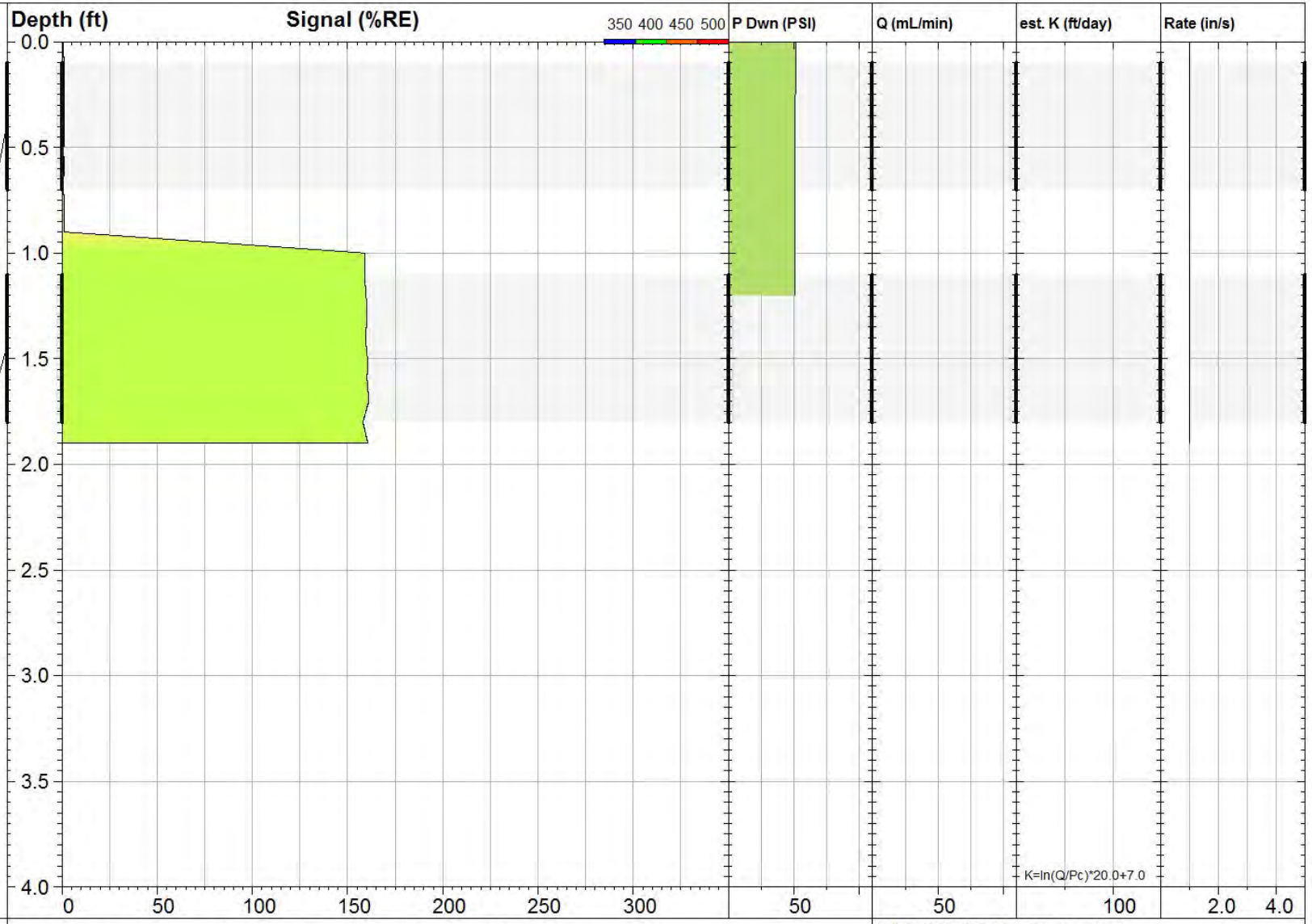
Product from holding tanks dripped on to clean sand until saturated.



0.10 - 0.70 ft
1.0 %RE (s 0.1)



1.10 - 1.80 ft
159.8 %RE (s 1.0)



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Emulation Product in Holding Tanks 2

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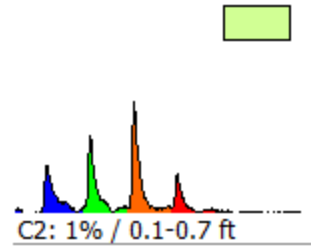
Site: **PES Complex**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **1.90 ft**
Client / Job: **Stantec / 0159.19**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **161.2 %RE @ 1.70 ft**
Operator / Unit: **R. Mulford / UVOST1023**	*Elevation:* **Unavailable**	*Date & Time:* **2019-05-16 11:57 EDT**

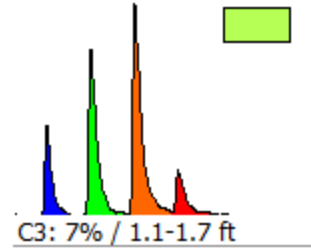
Appendix D

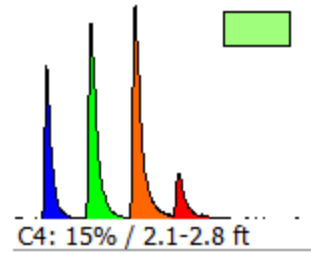
Advanced Analysis

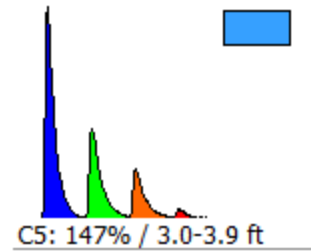
Emulation Product in Holding Tanks



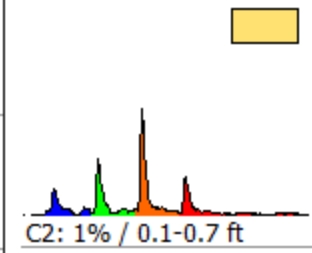






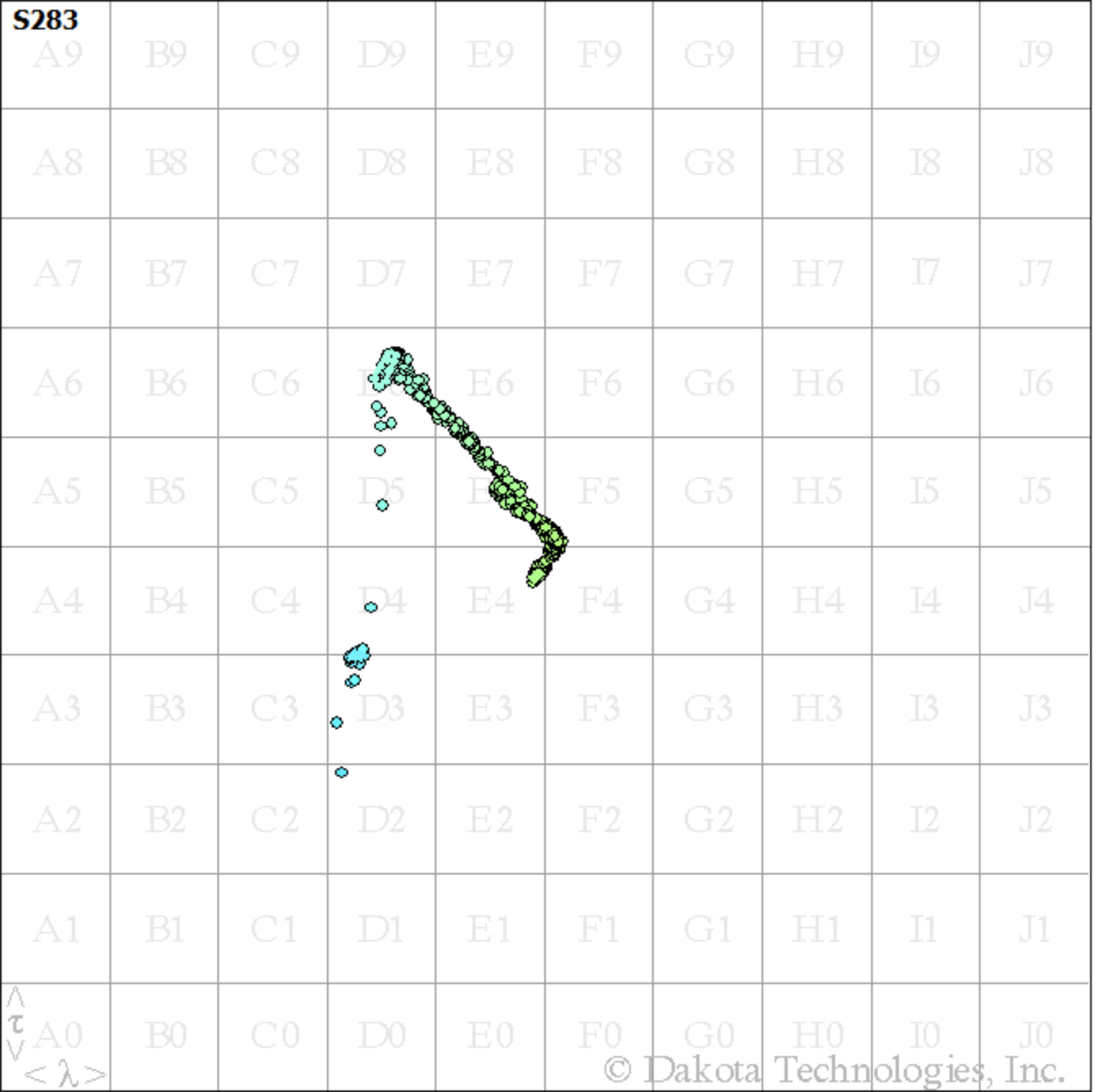


Emulation Product in Holding Tanks 2

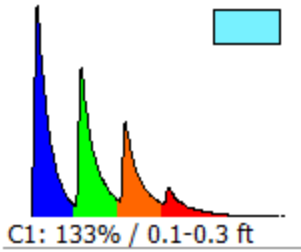


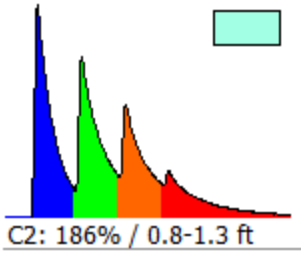
© Dakota Technologies, Inc.

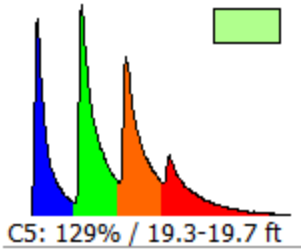
S283



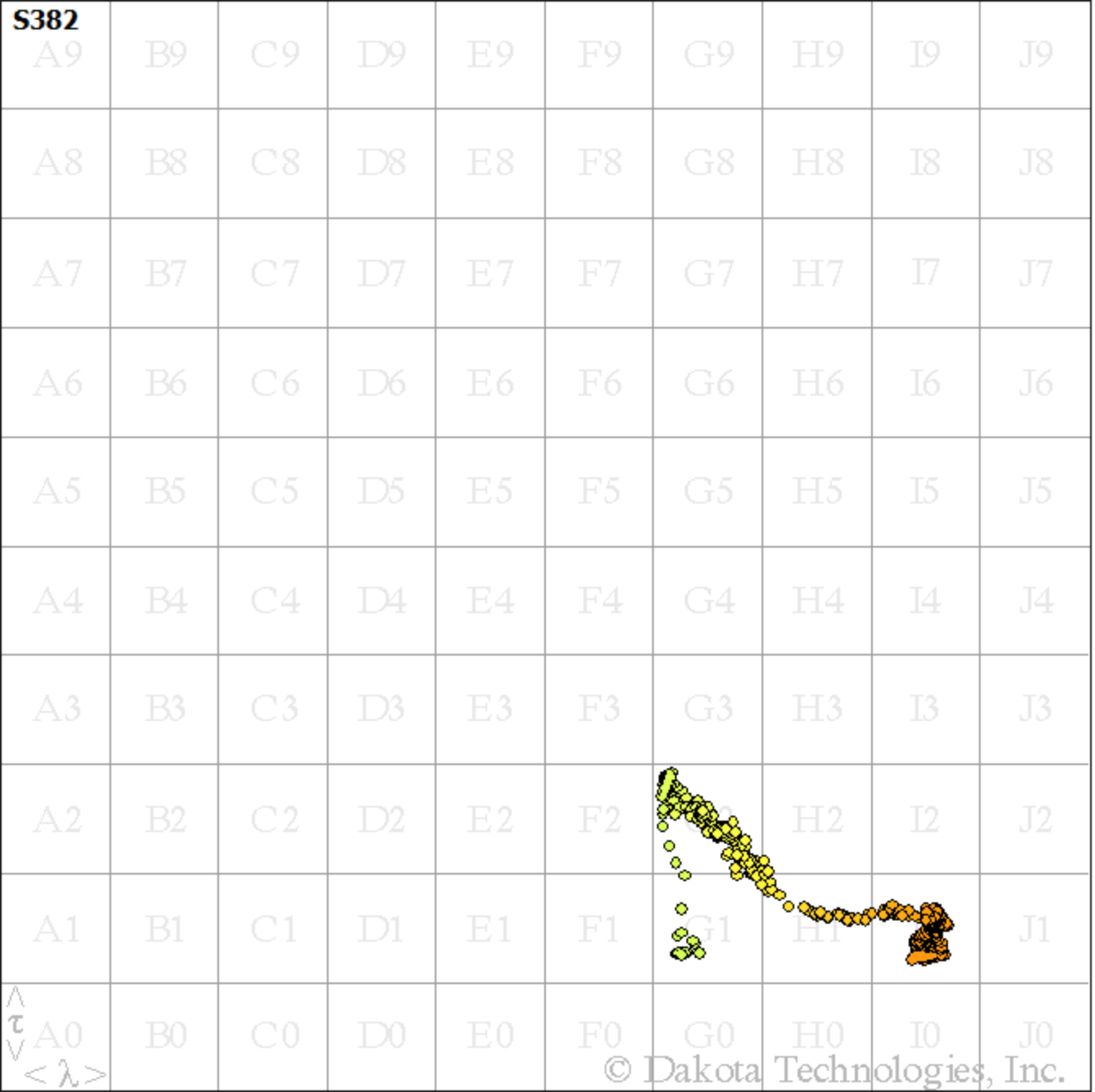
© Dakota Technologies, Inc.

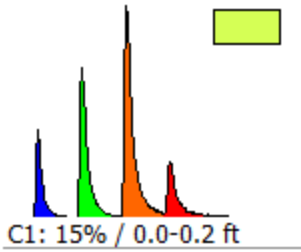


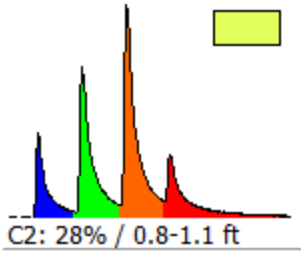


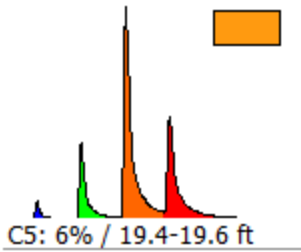


S382

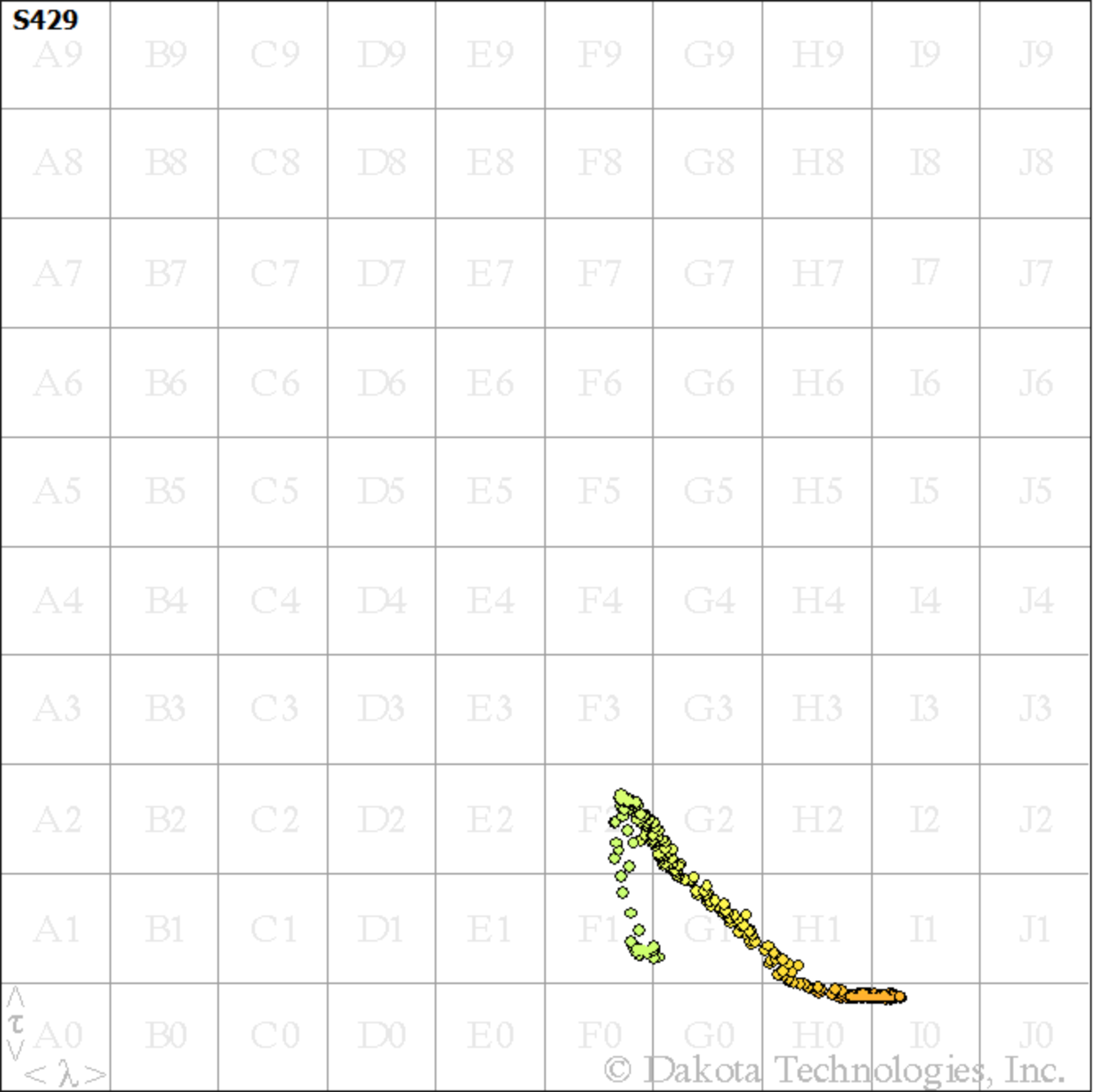

A9 B9 C9 D9 E9 F9 G9 H9 I9 J9
A8 B8 C8 D8 E8 F8 G8 H8 I8 J8
A7 B7 C7 D7 E7 F7 G7 H7 I7 J7
A6 B6 C6 D6 E6 F6 G6 H6 I6 J6
A5 B5 C5 D5 E5 F5 G5 H5 I5 J5
A4 B4 C4 D4 E4 F4 G4 H4 I4 J4
A3 B3 C3 D3 E3 F3 G3 H3 I3 J3
A2 B2 C2 D2 E2 F2 H2 I2 J2
A1 B1 C1 D1 E1 F1 H1 J1
A0 B0 C0 D0 E0 F0 G0 H0 I0 J0
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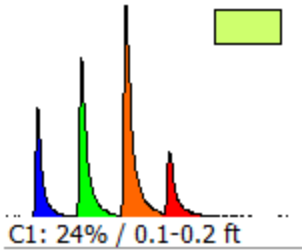

C1: 15% / 0.0-0.2 ft

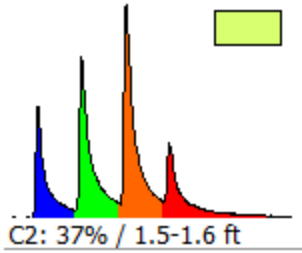

C2: 28% / 0.8-1.1 ft

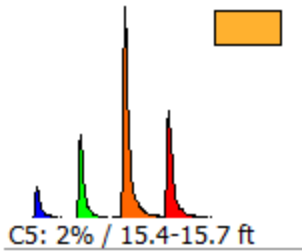

C5: 6% / 19.4-19.6 ft

S429



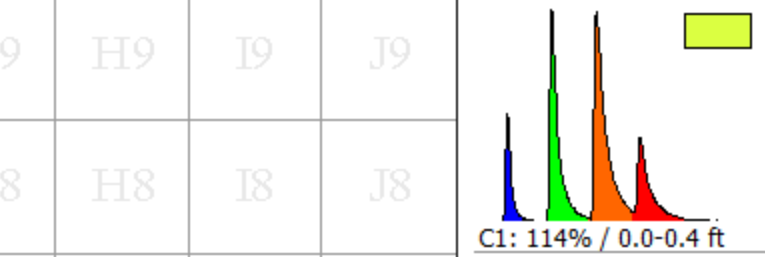


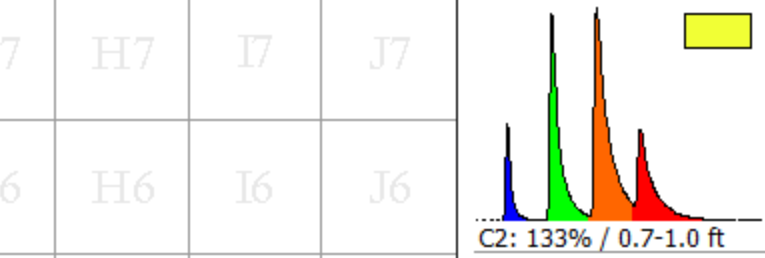


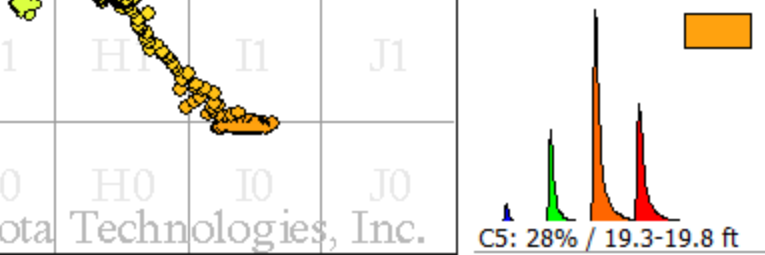


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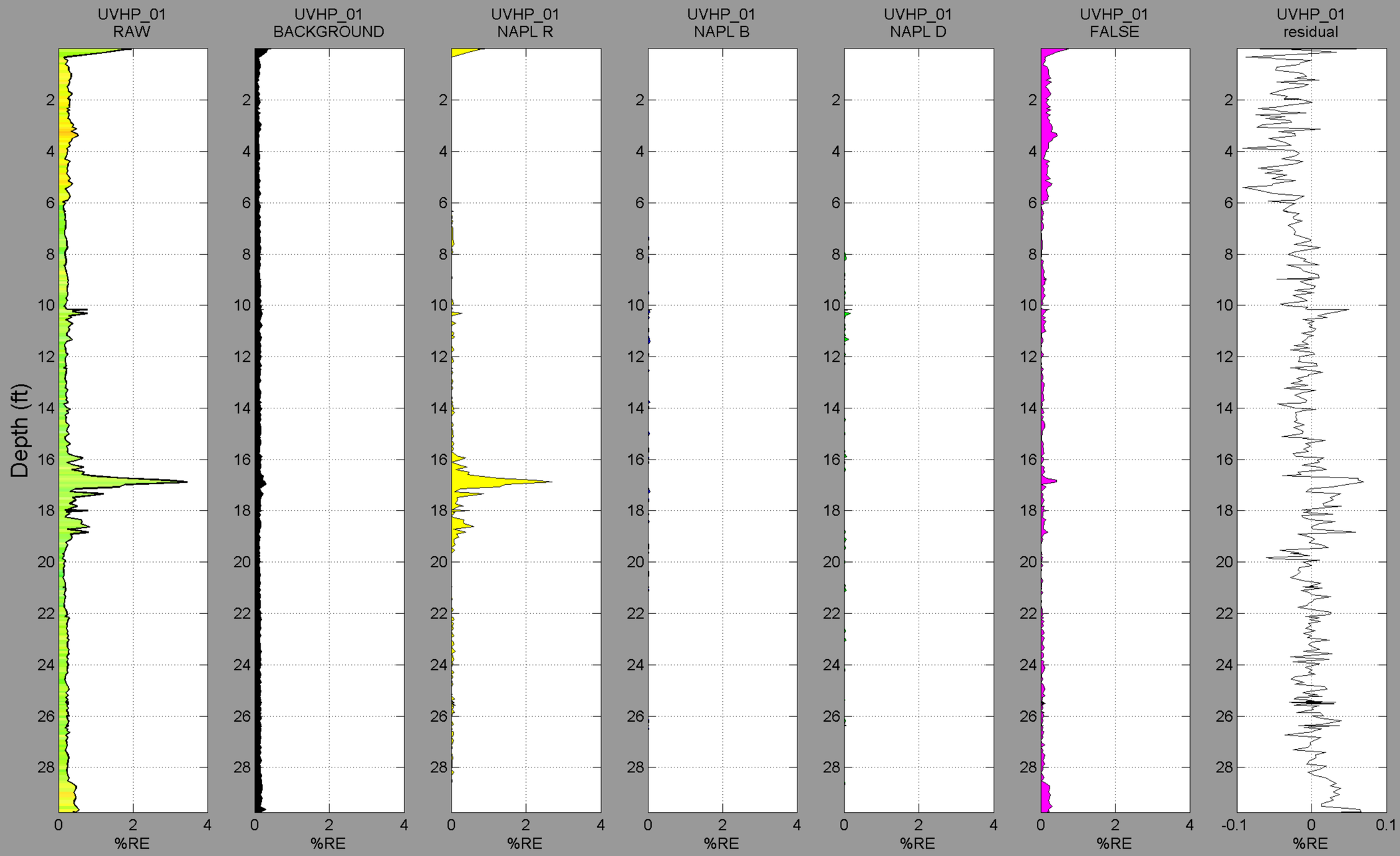
S430



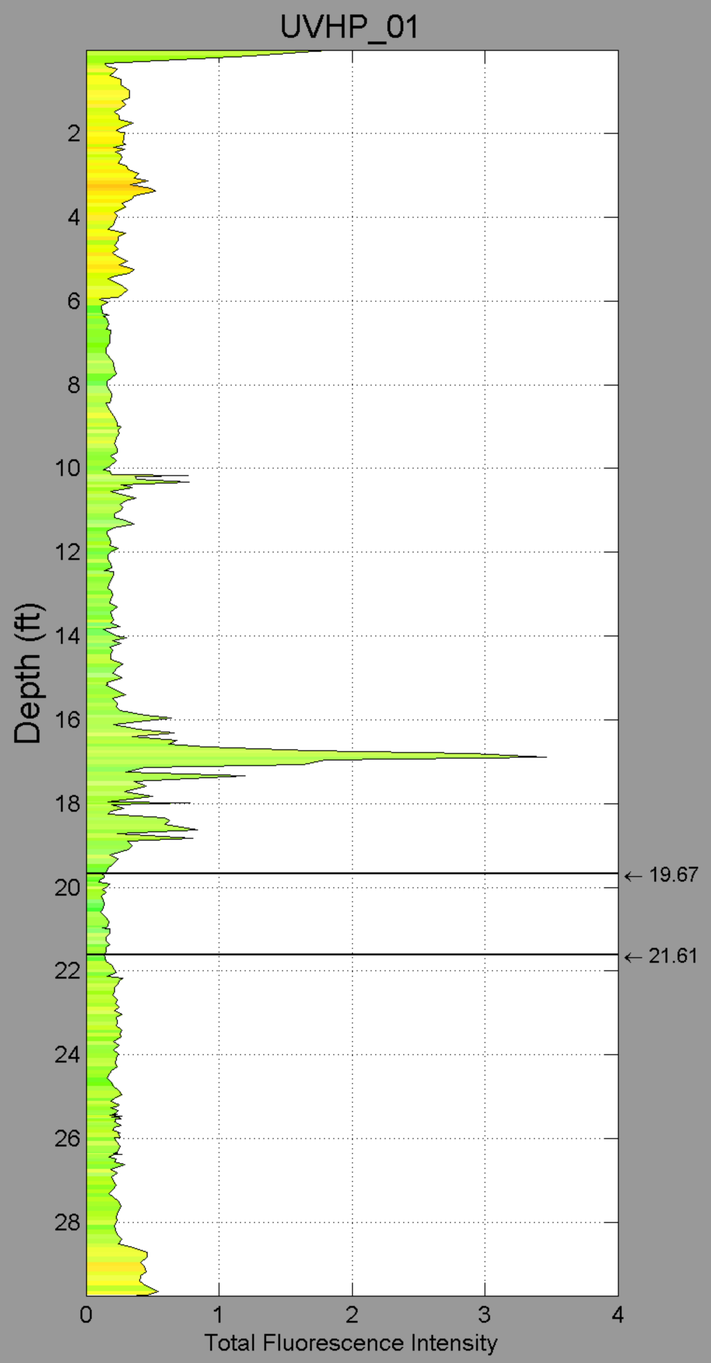


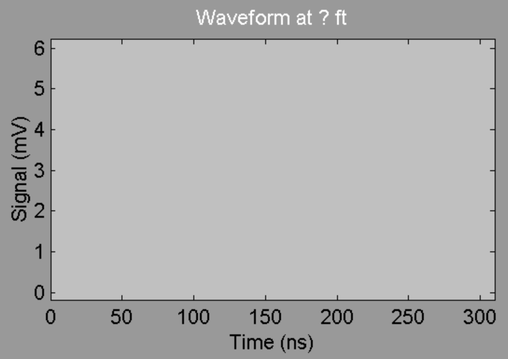


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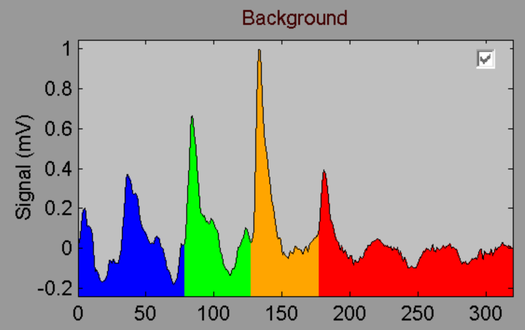


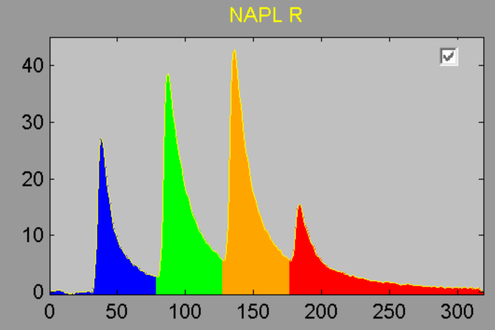
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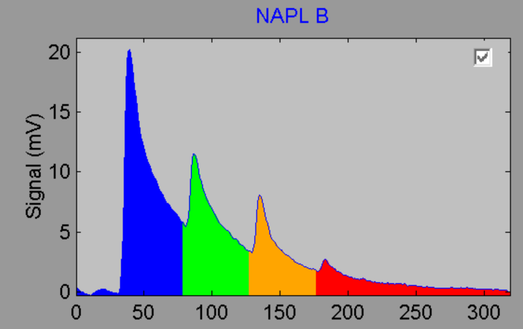


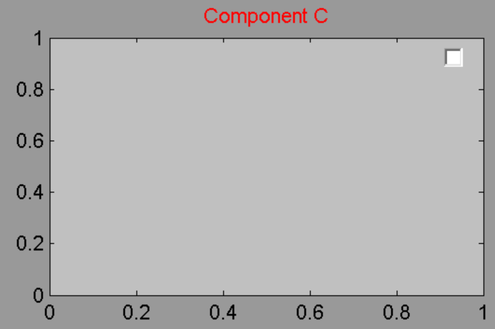


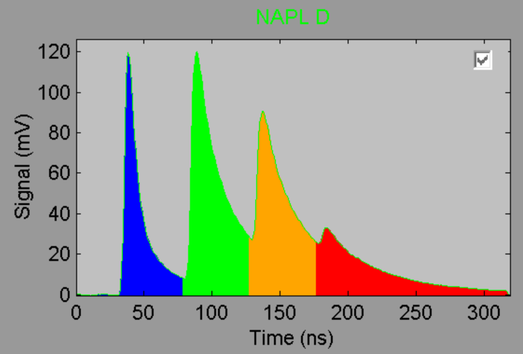


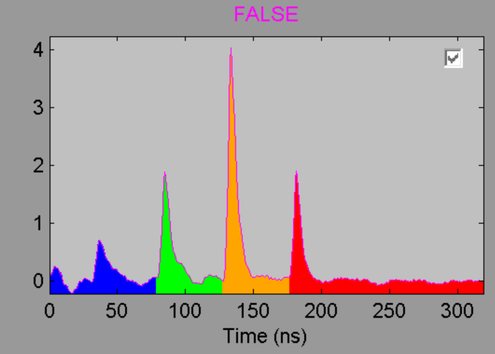




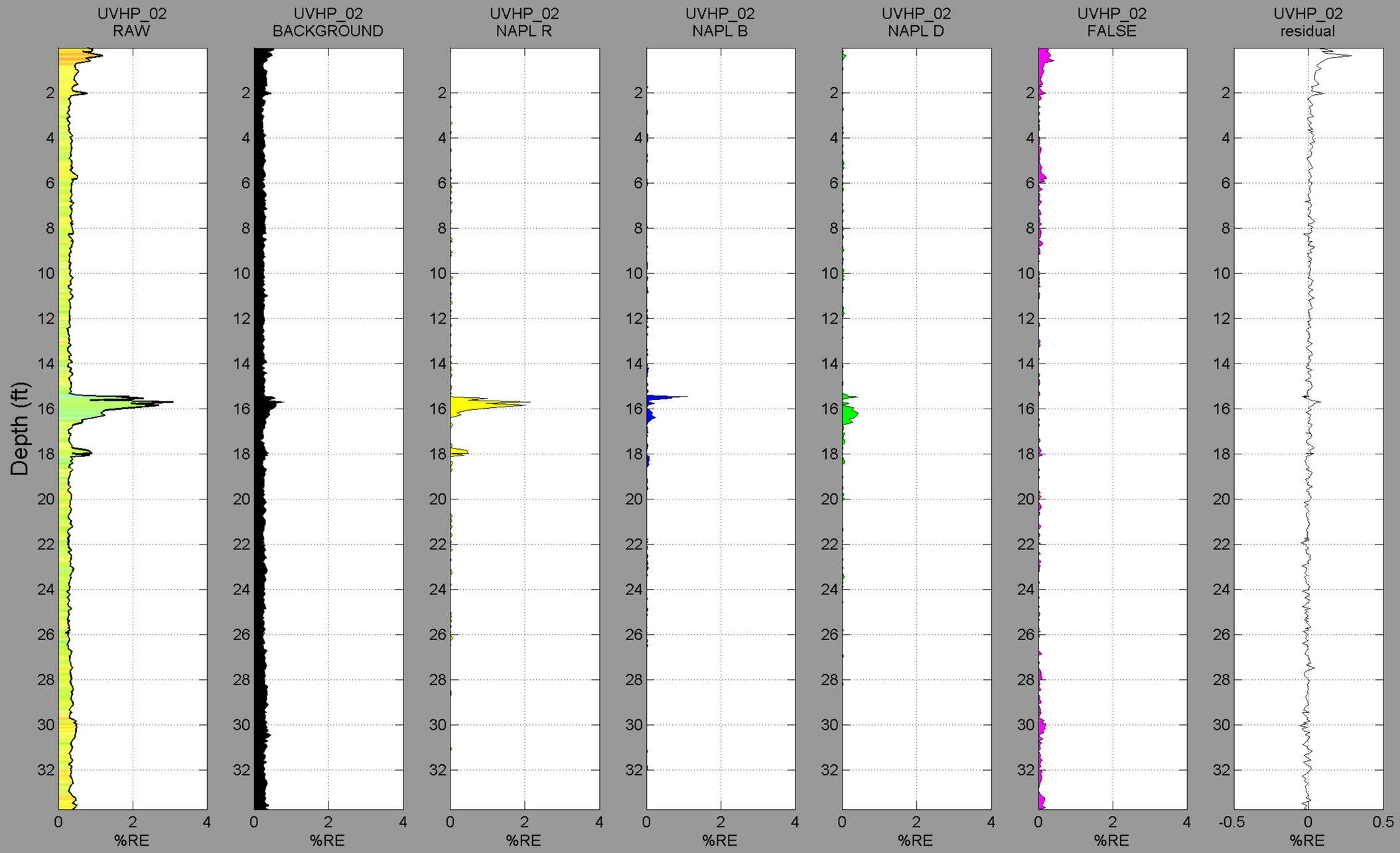


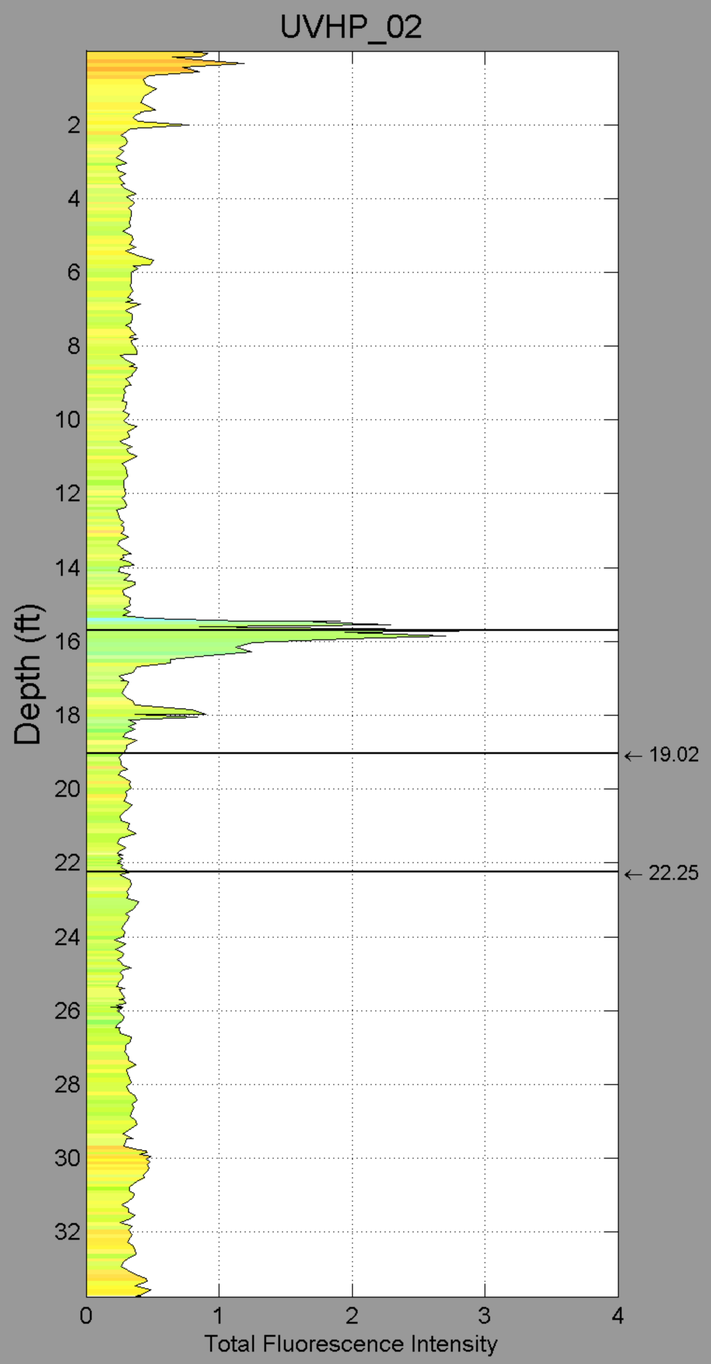


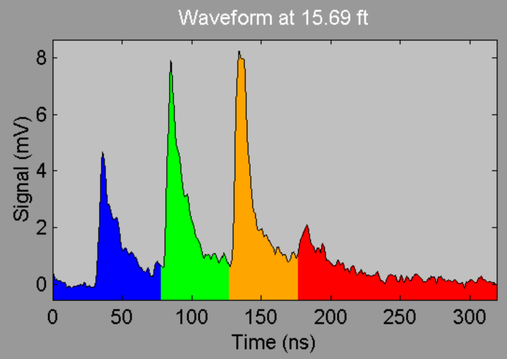




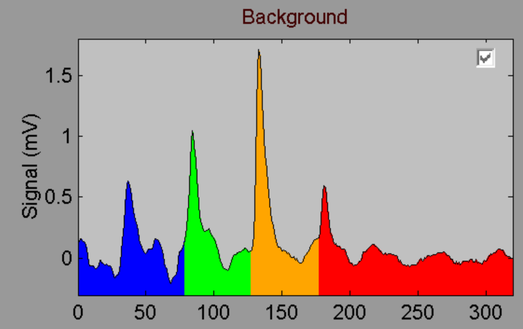
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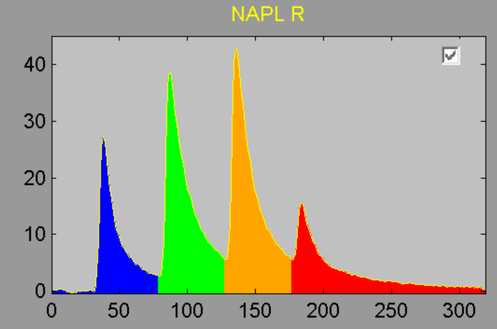

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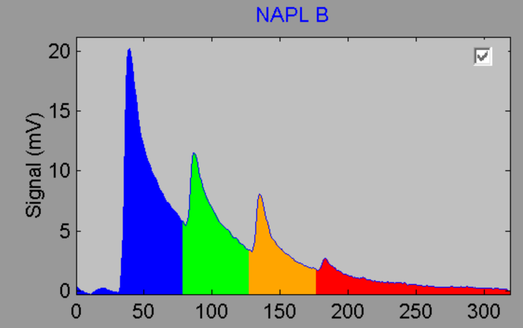


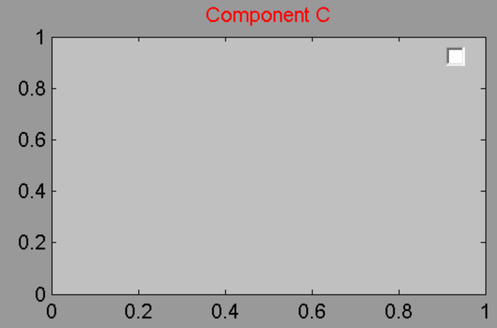


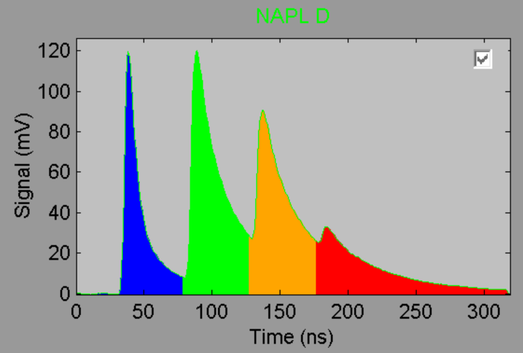


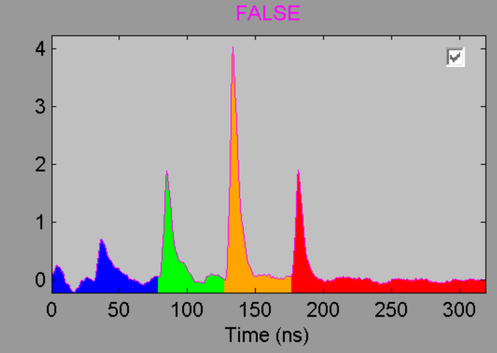




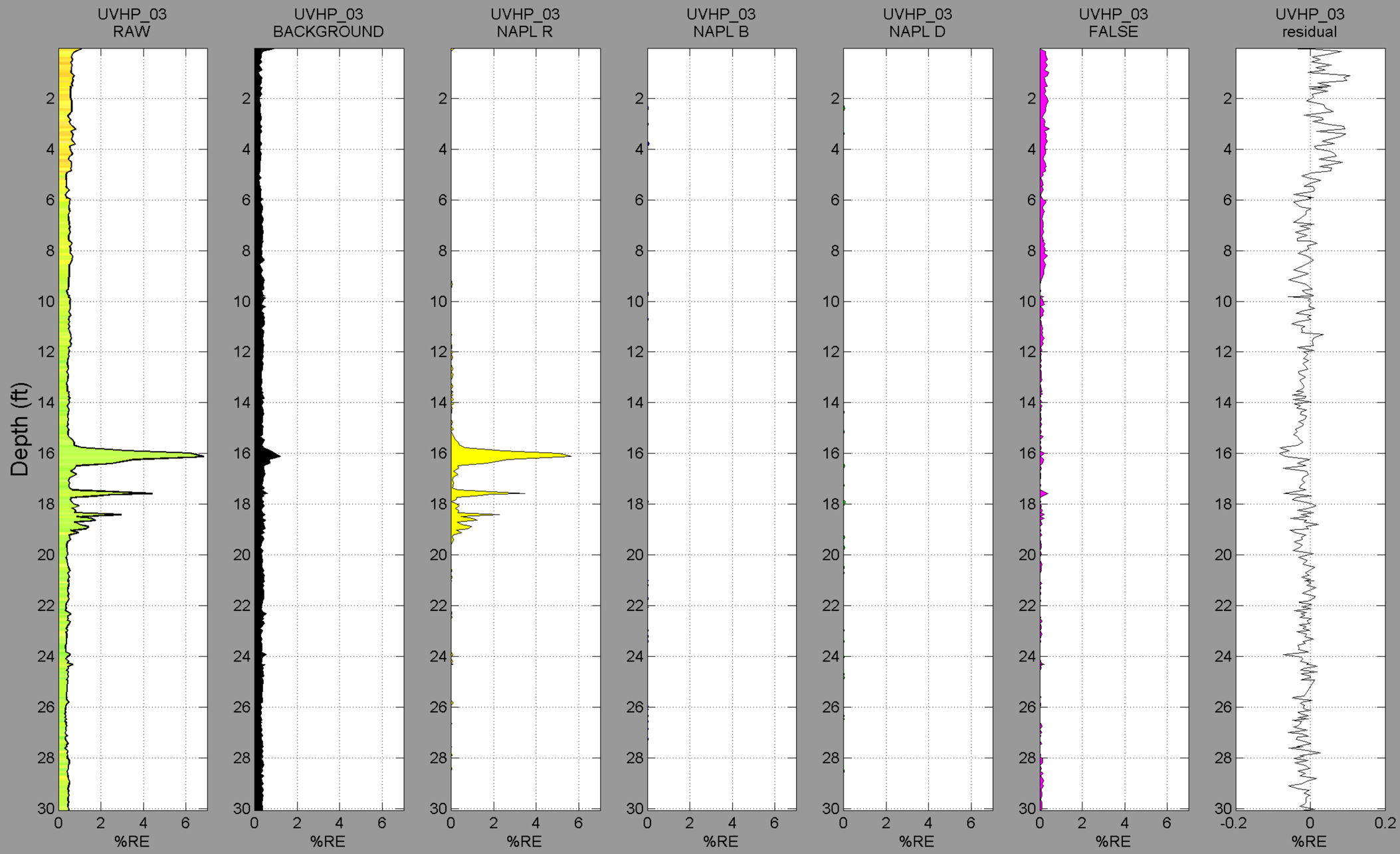


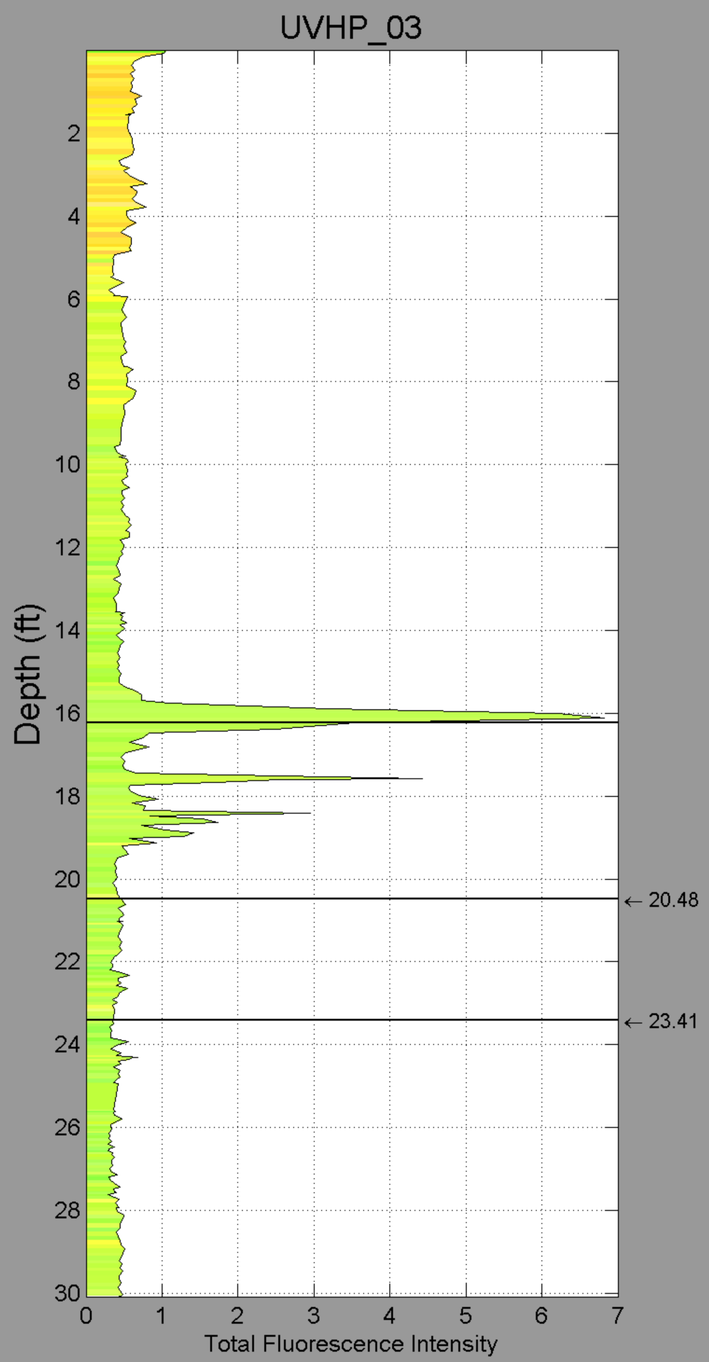


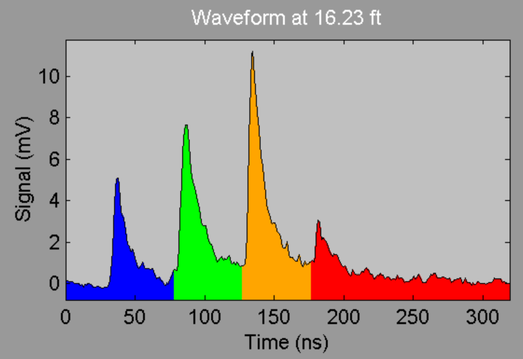




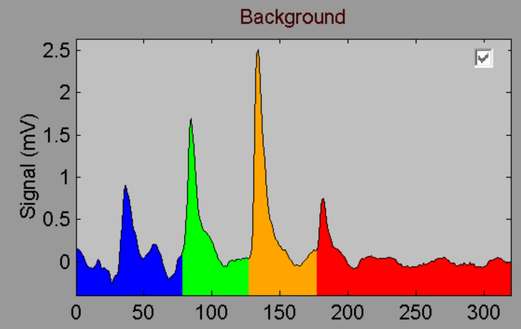
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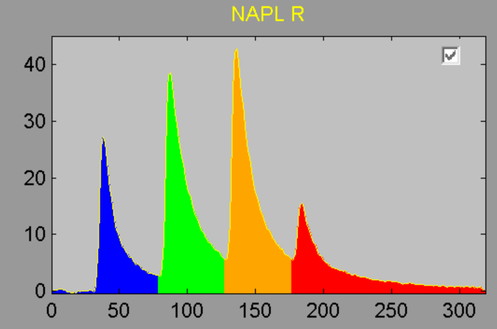

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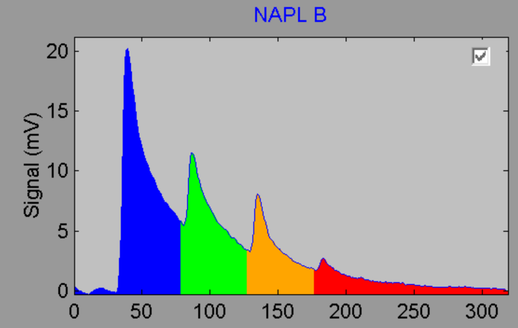


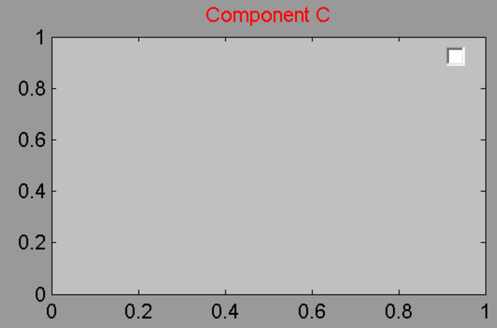


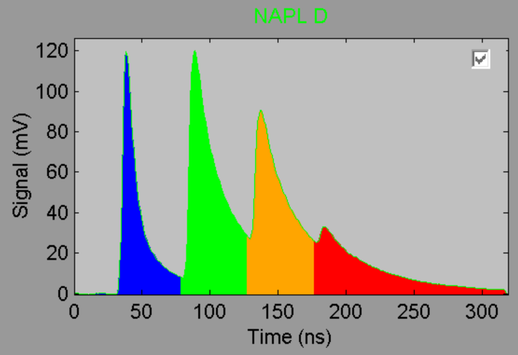


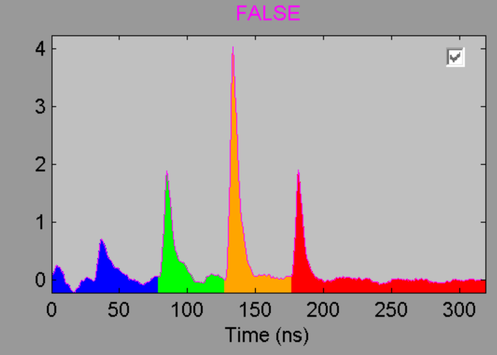




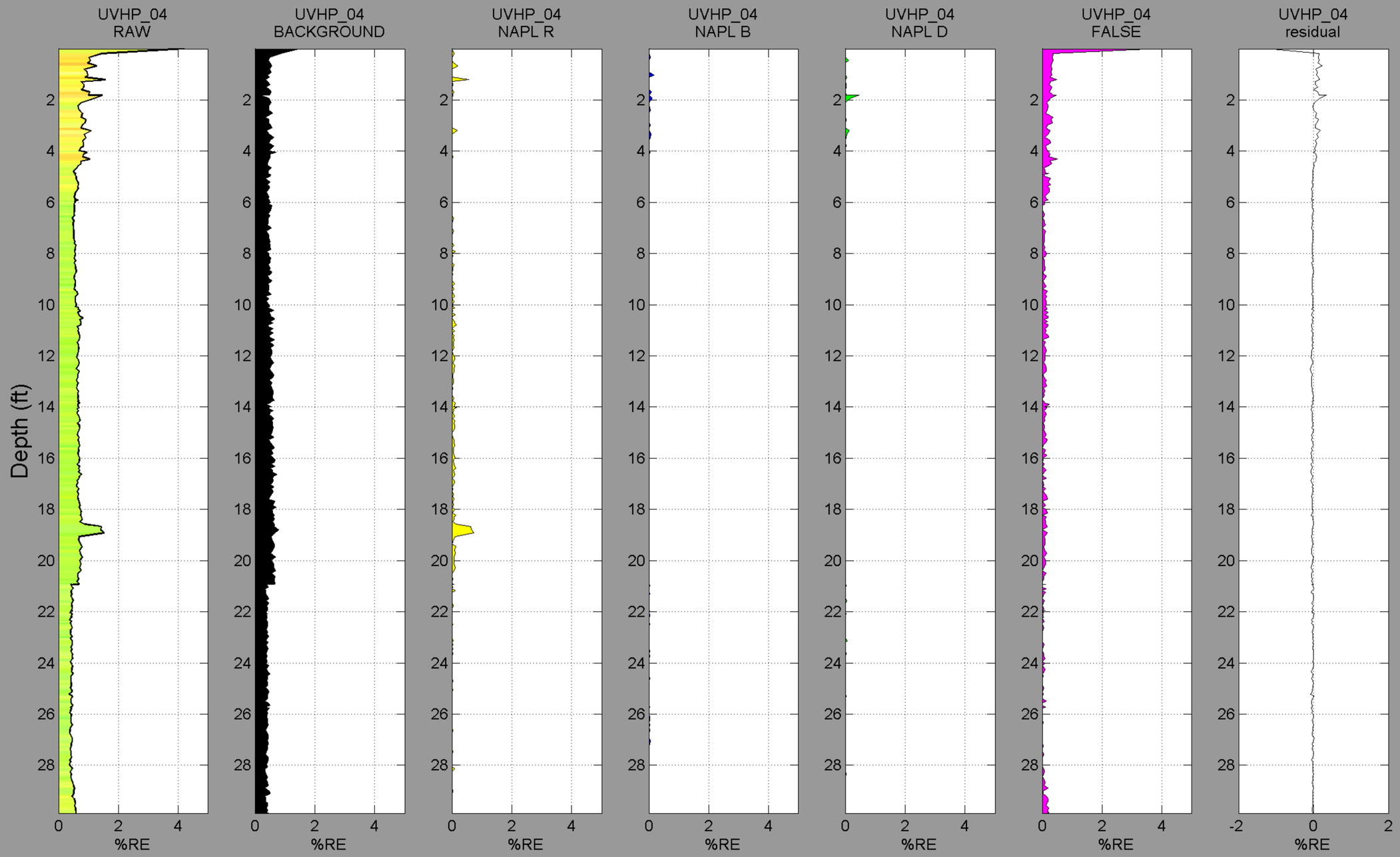


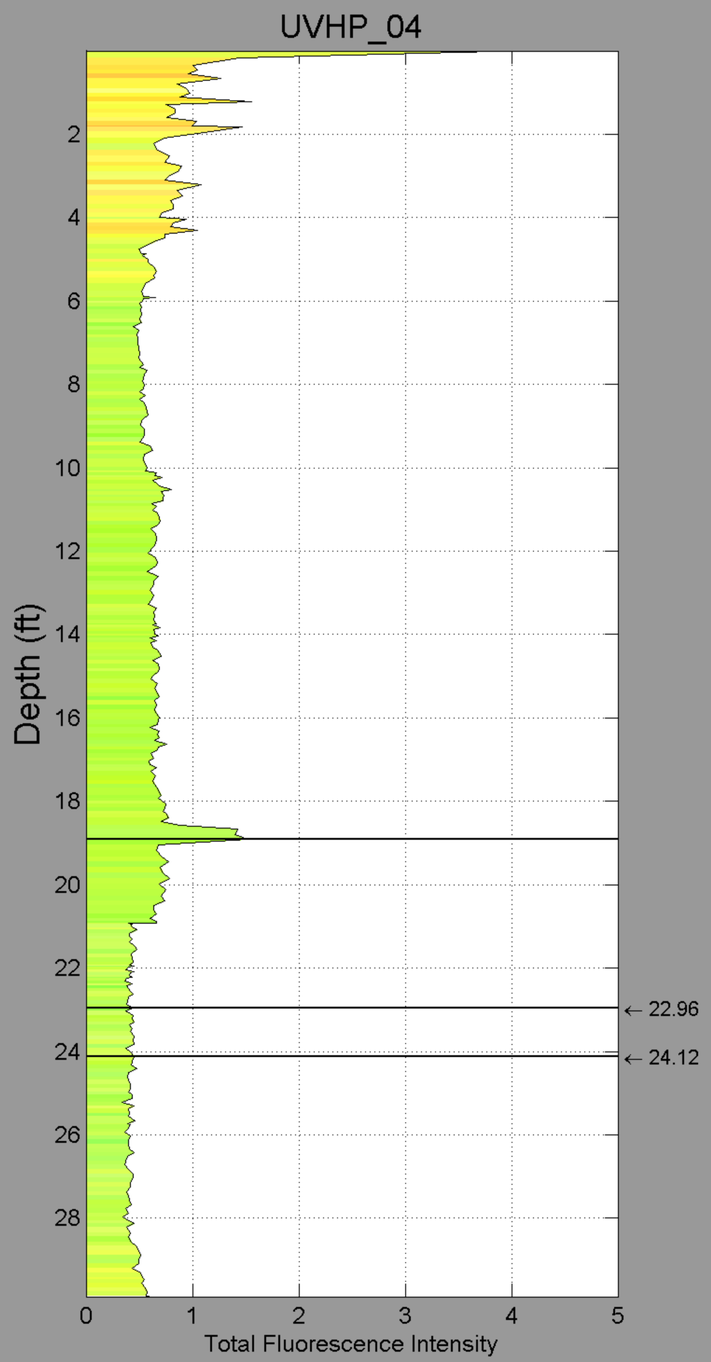


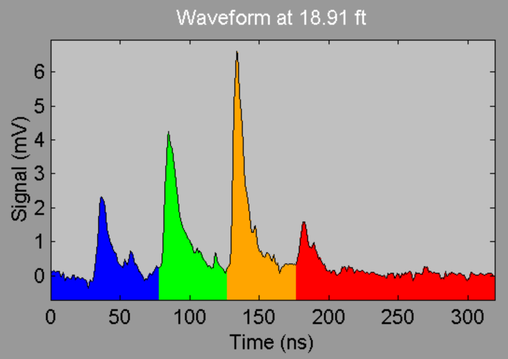




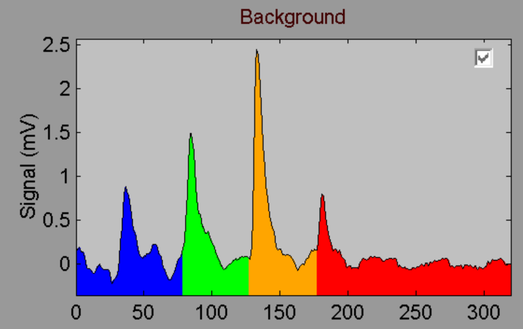
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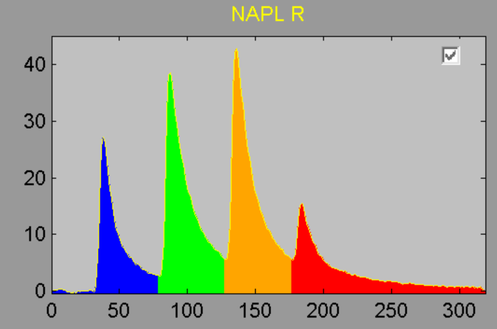

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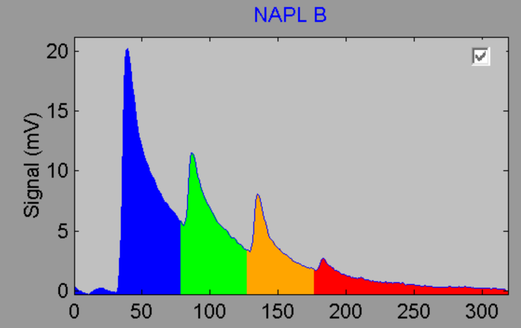


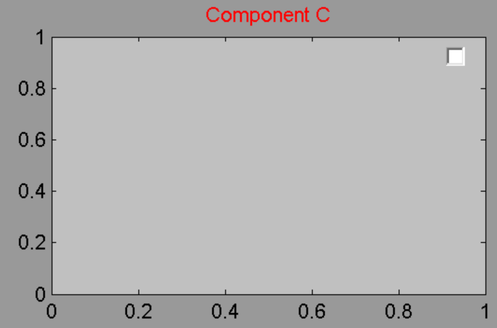


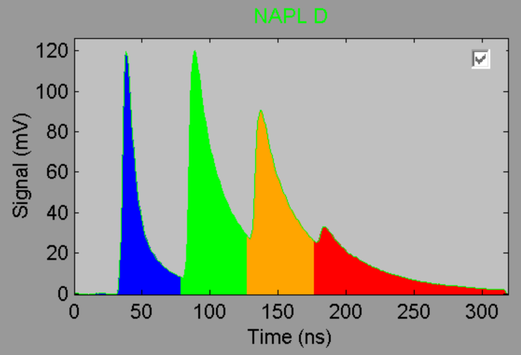


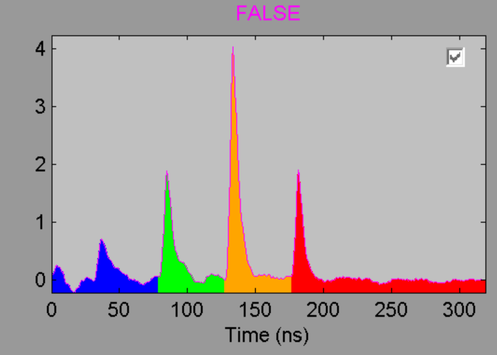




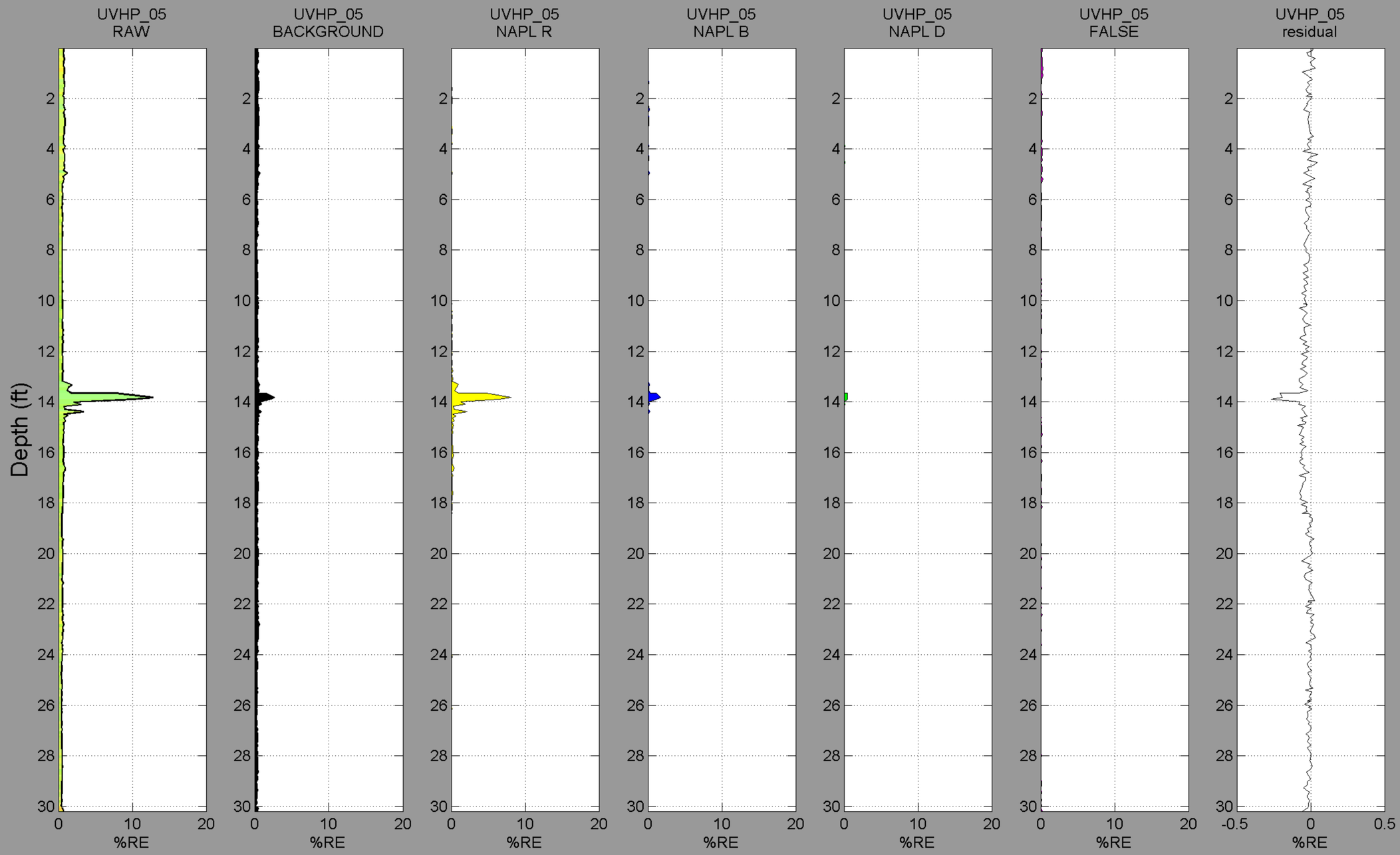


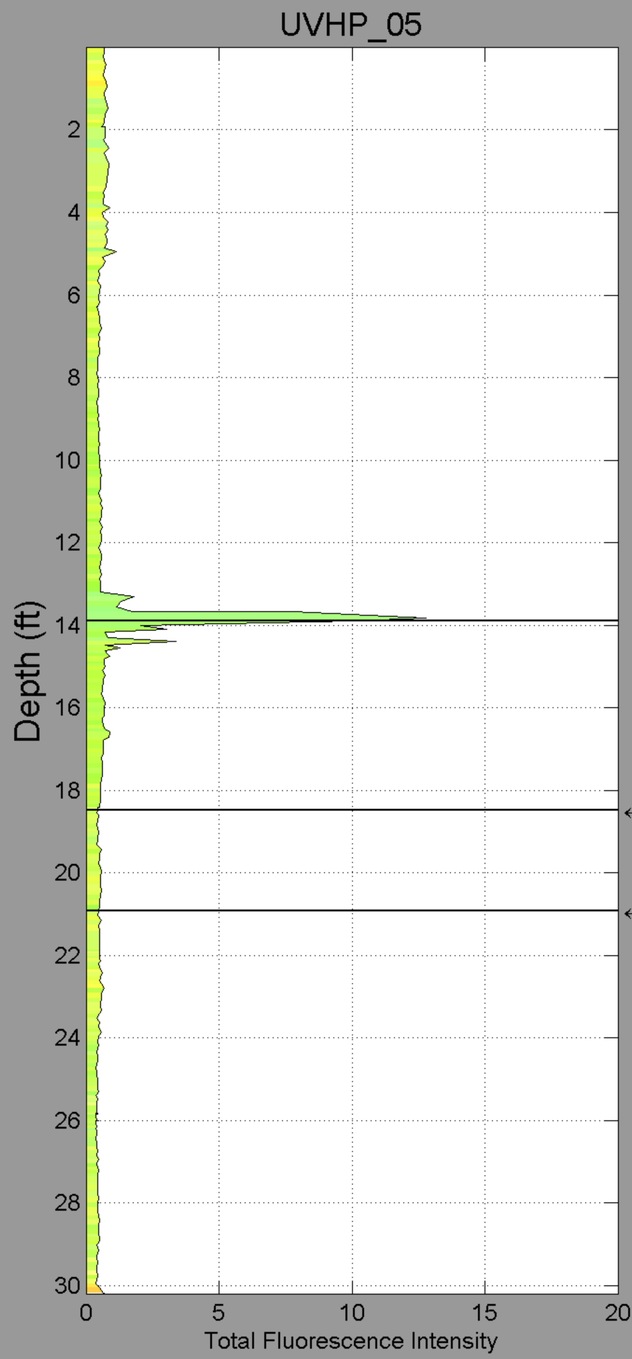


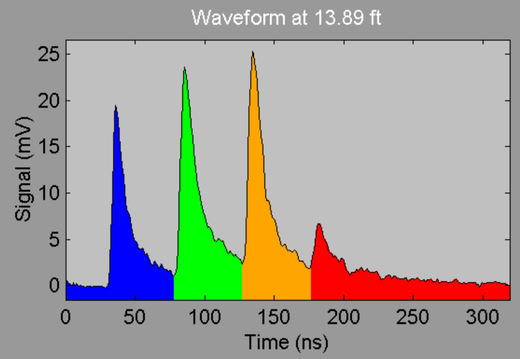




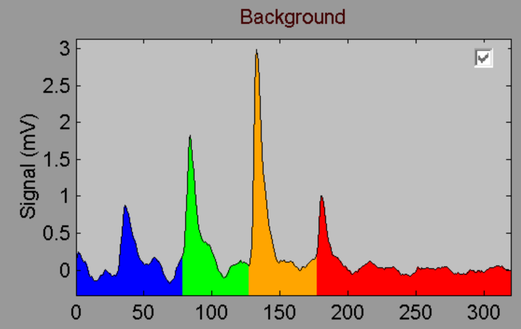
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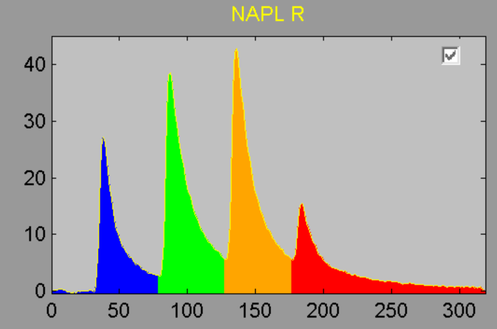

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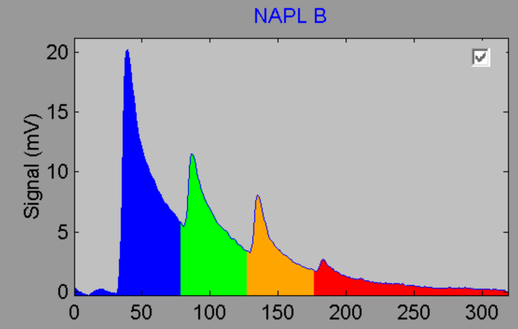


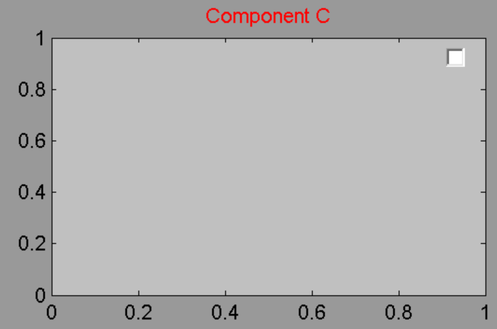


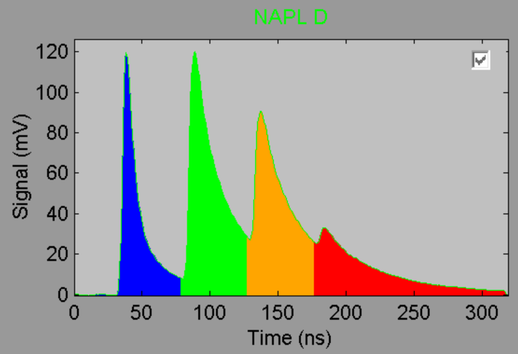


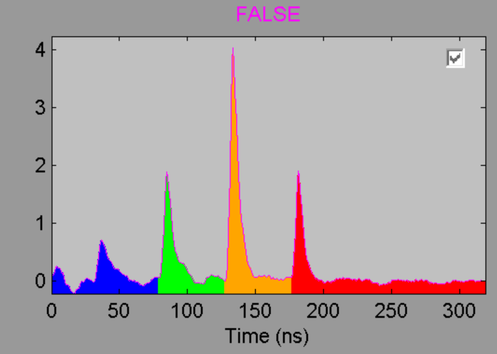




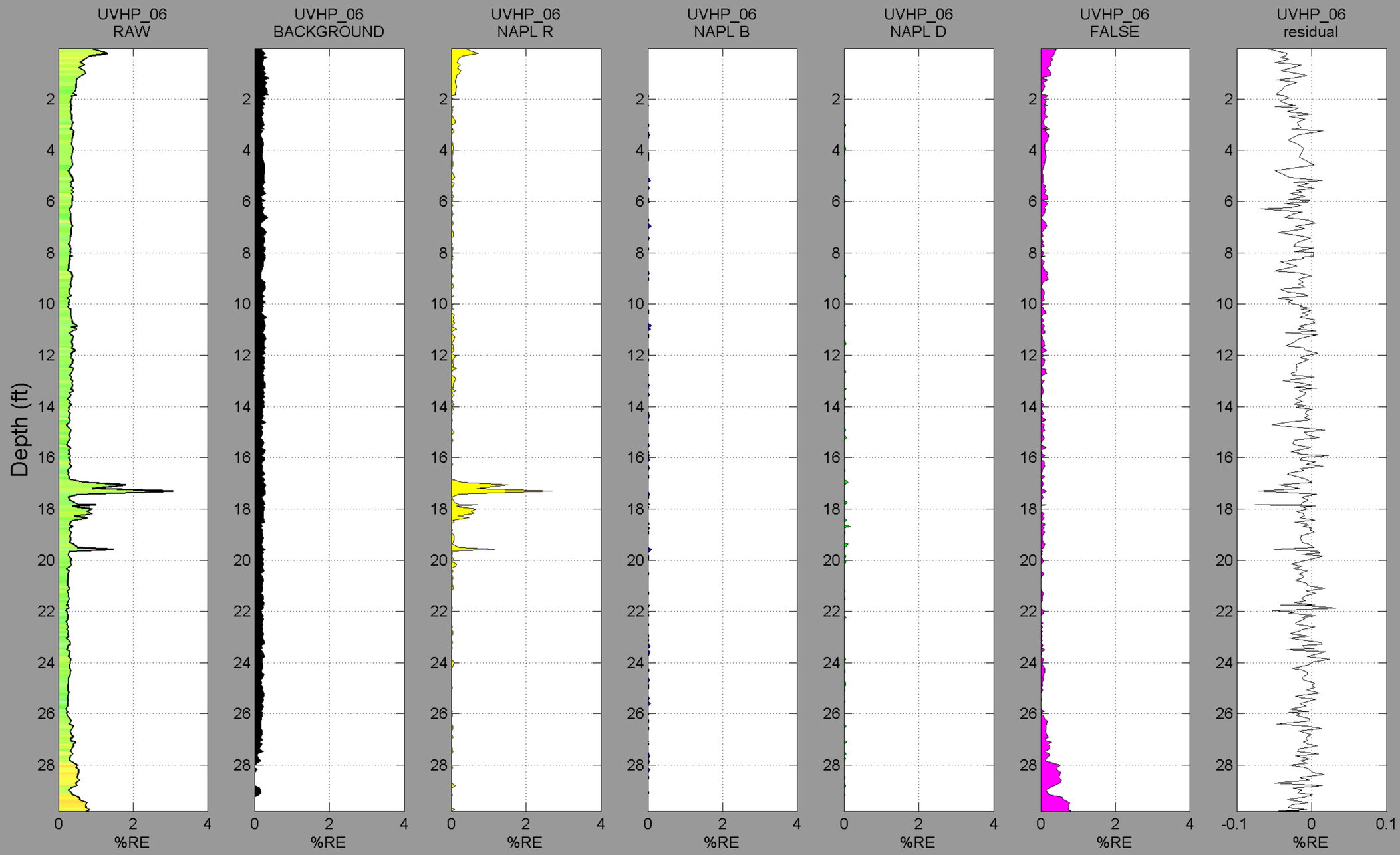




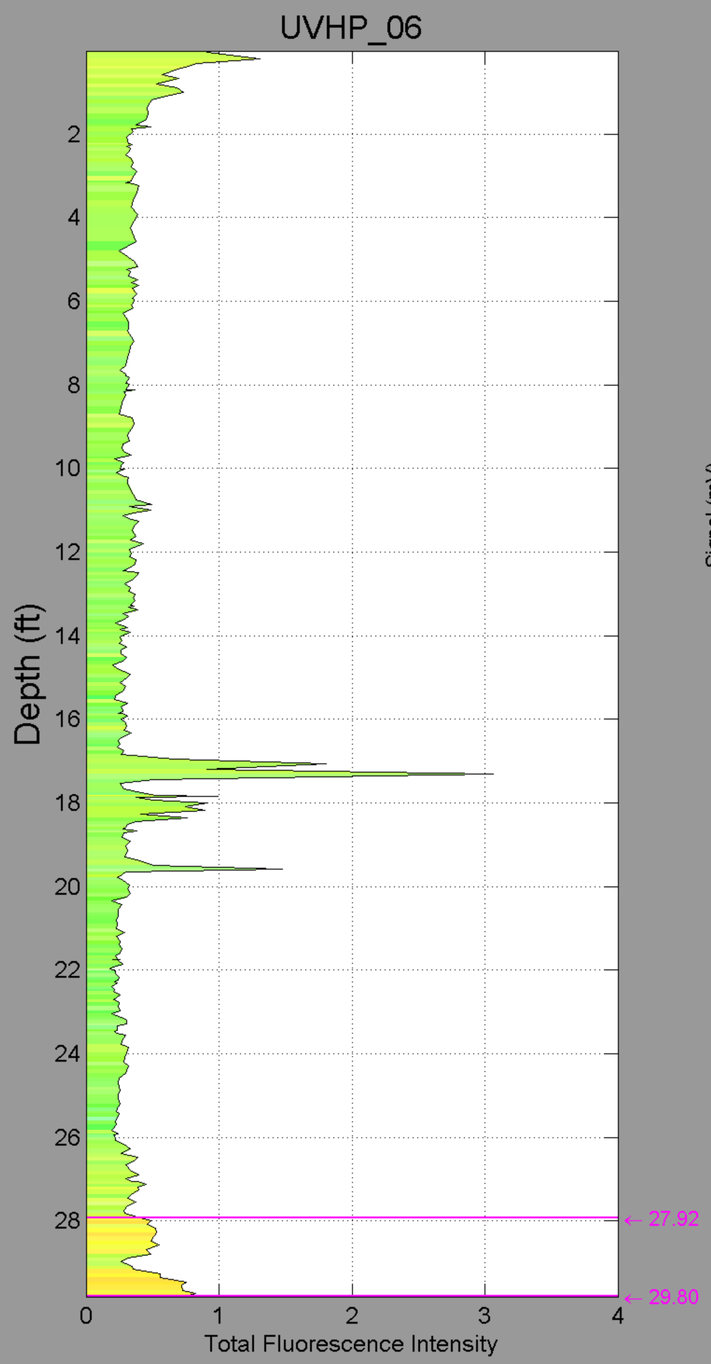


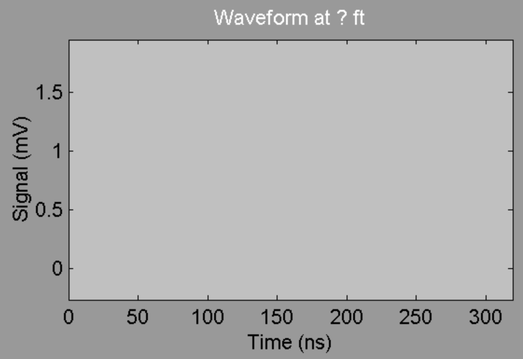


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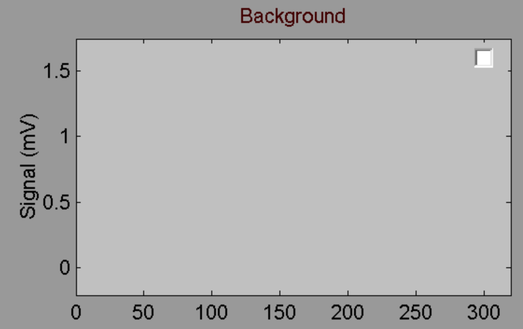


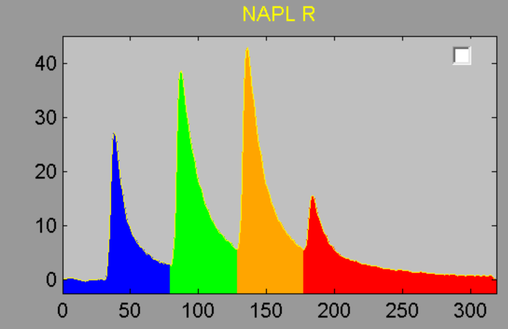
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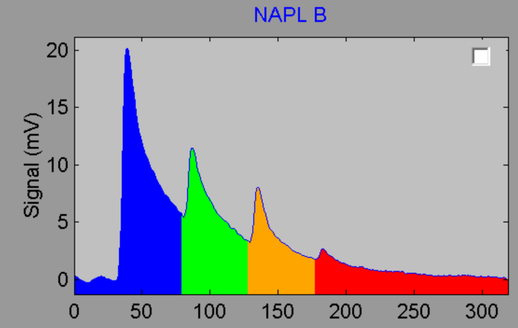


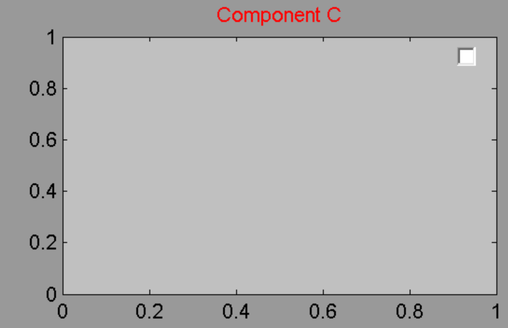


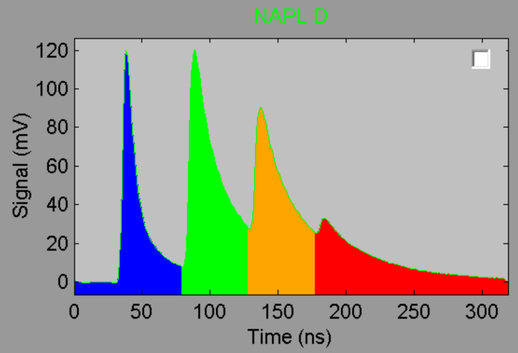


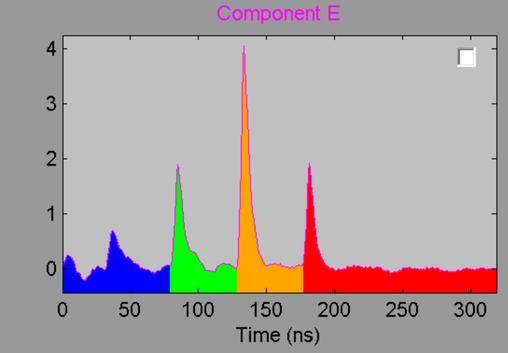




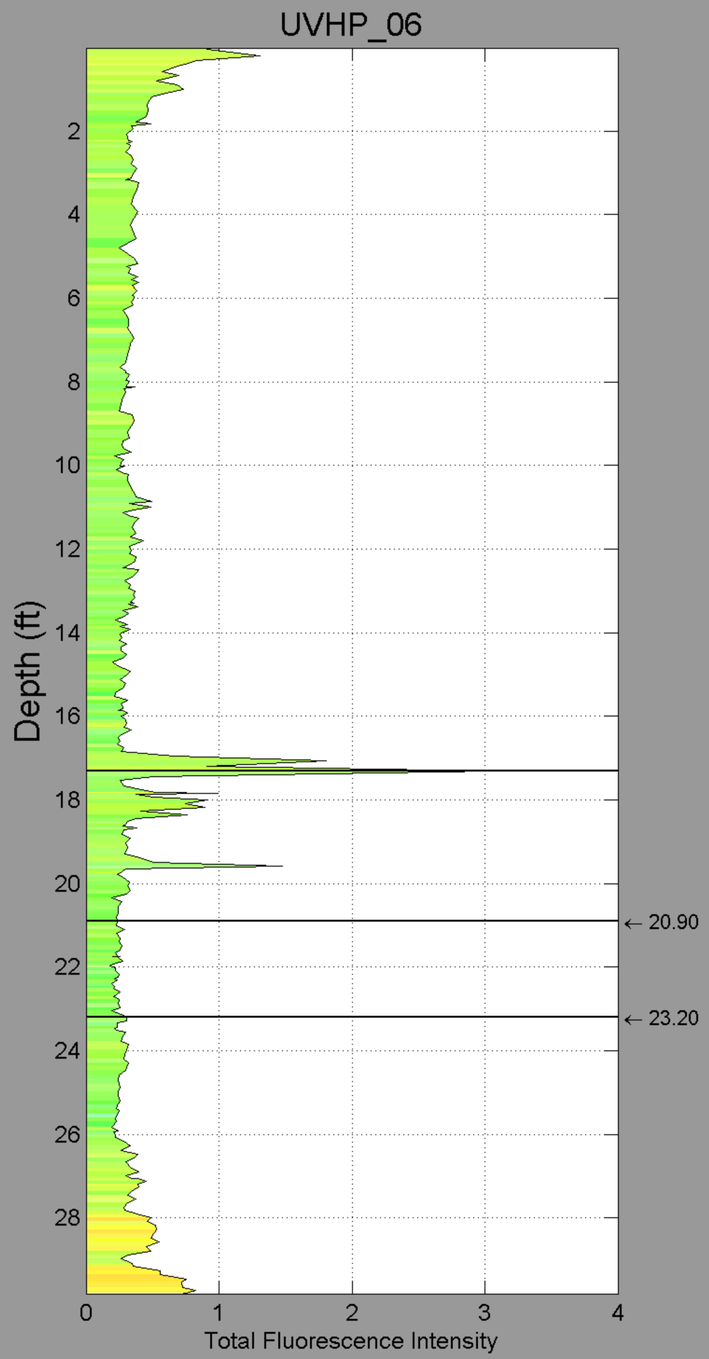


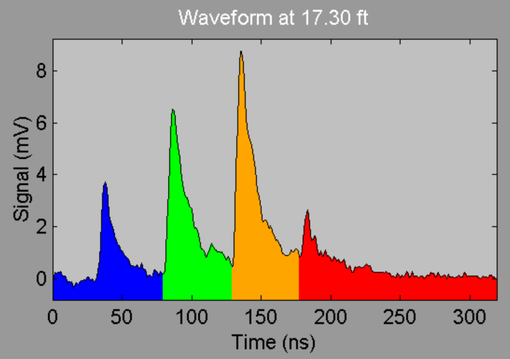




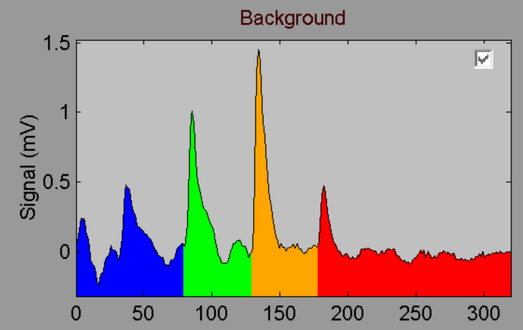


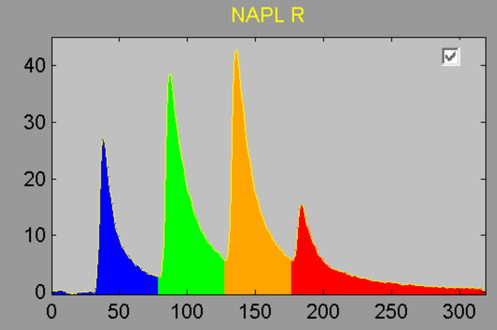
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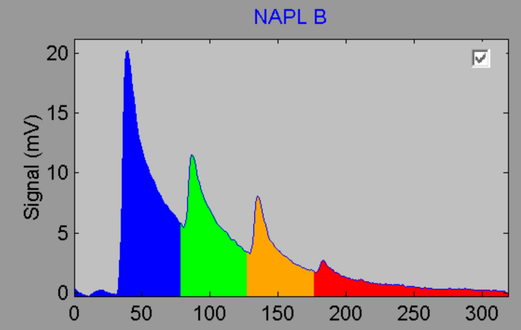


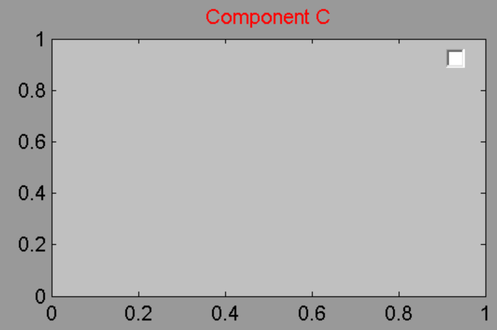


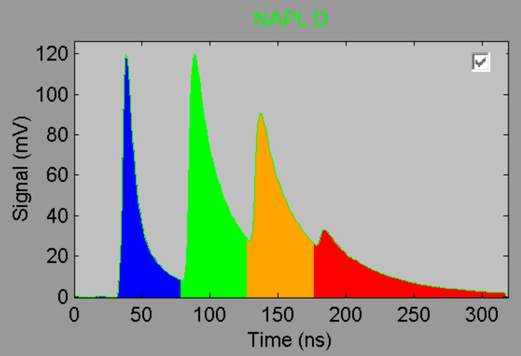


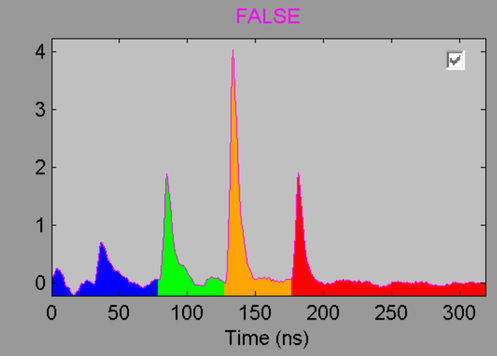




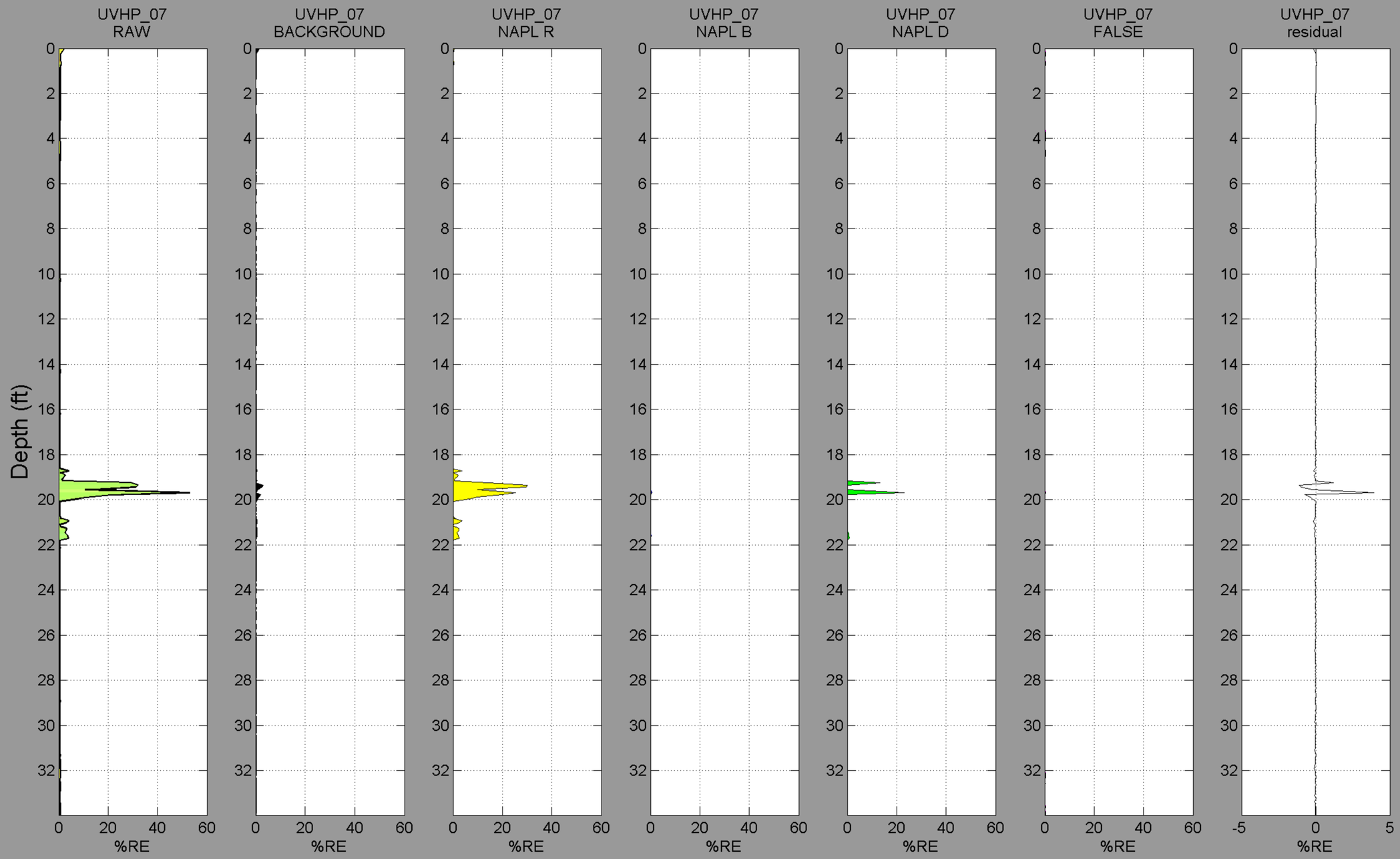




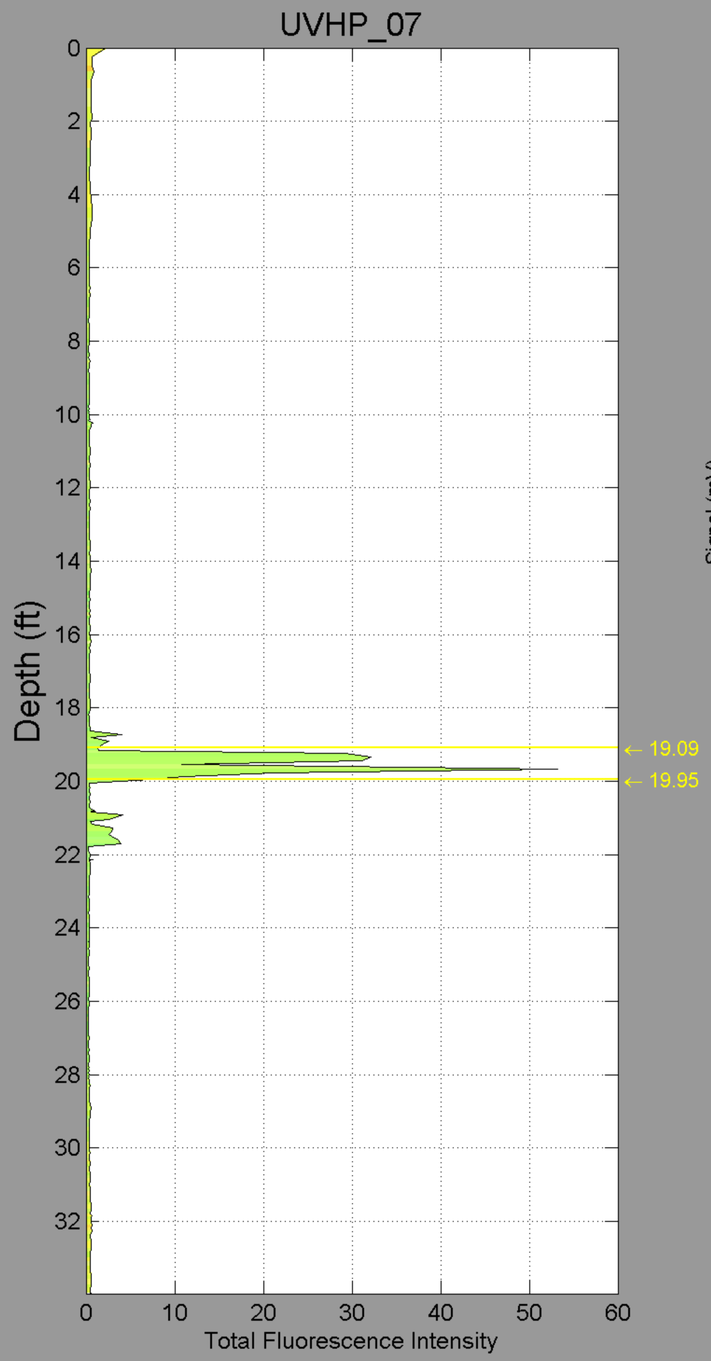


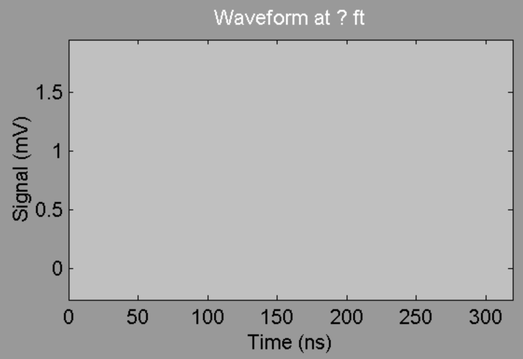


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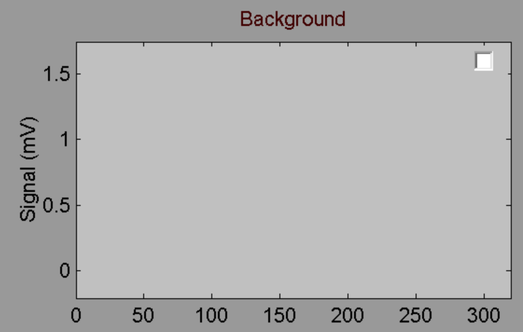


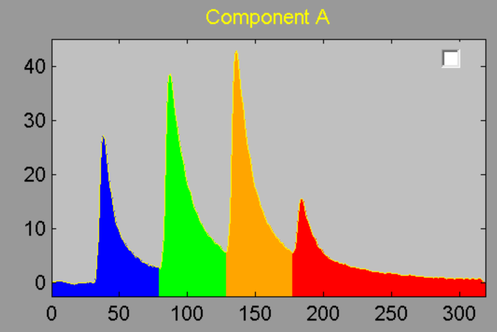
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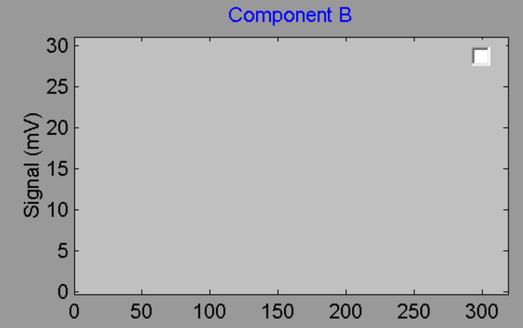


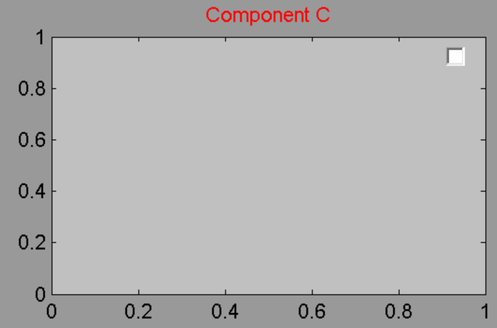


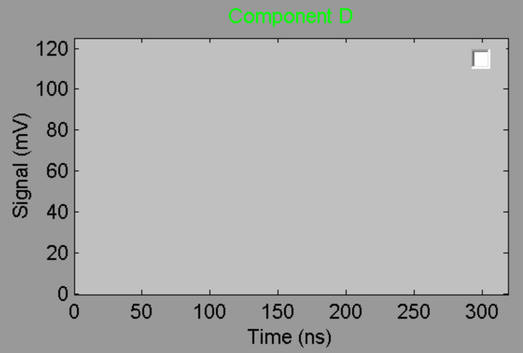


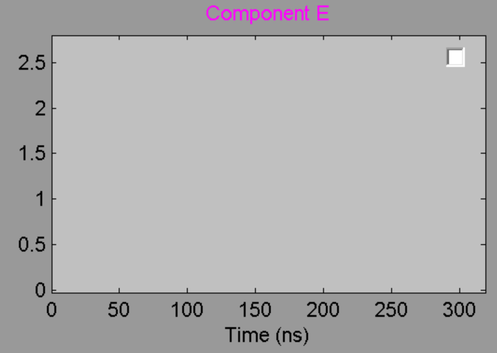




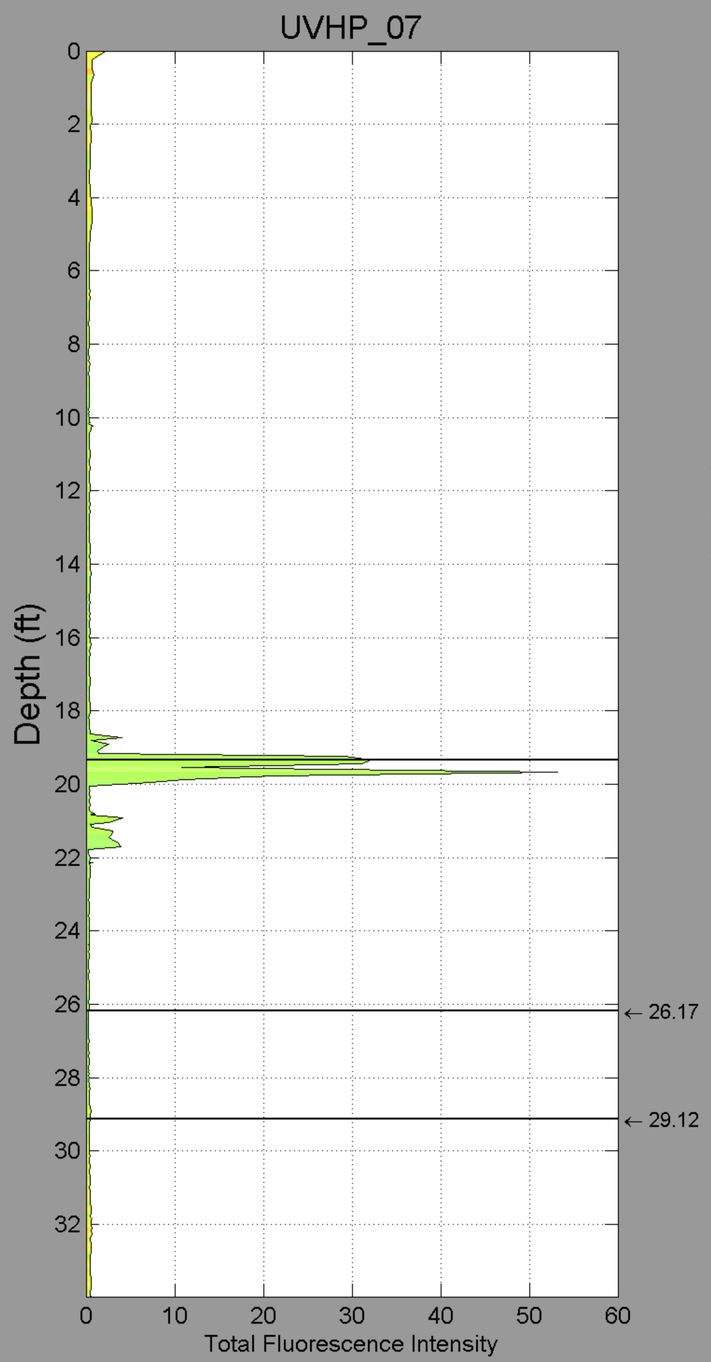


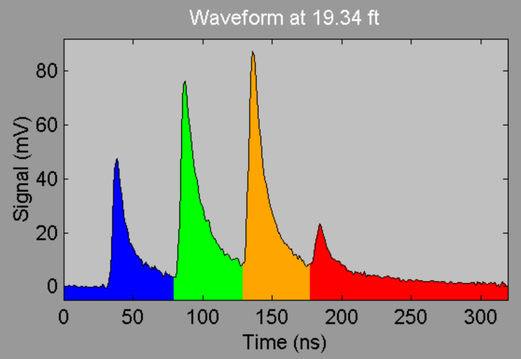




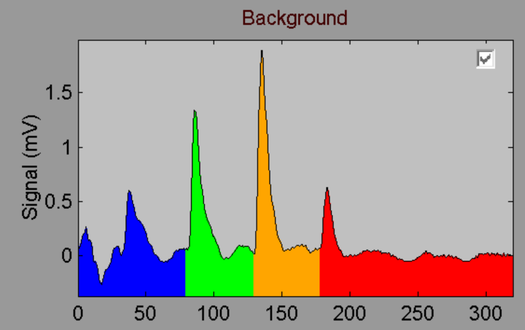


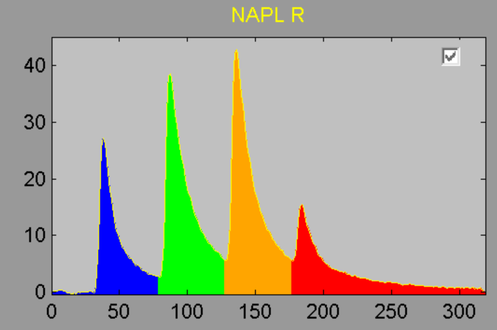
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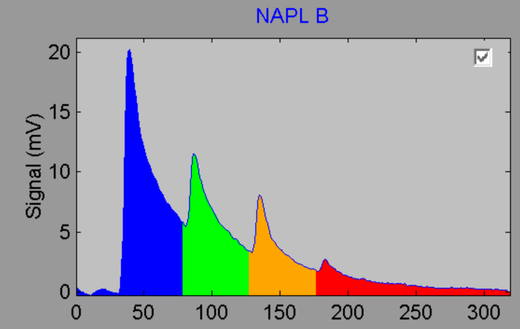


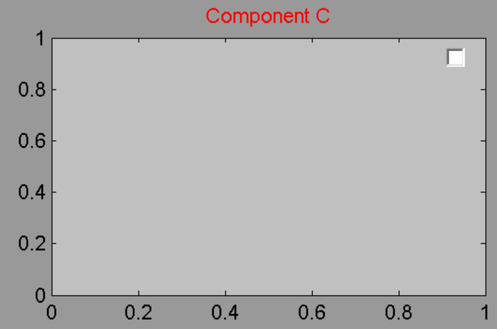


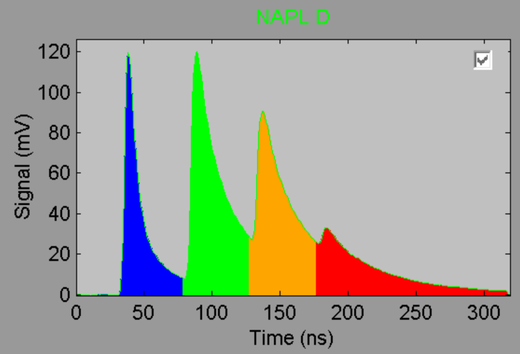


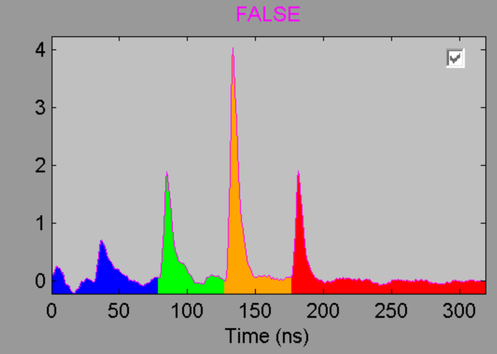




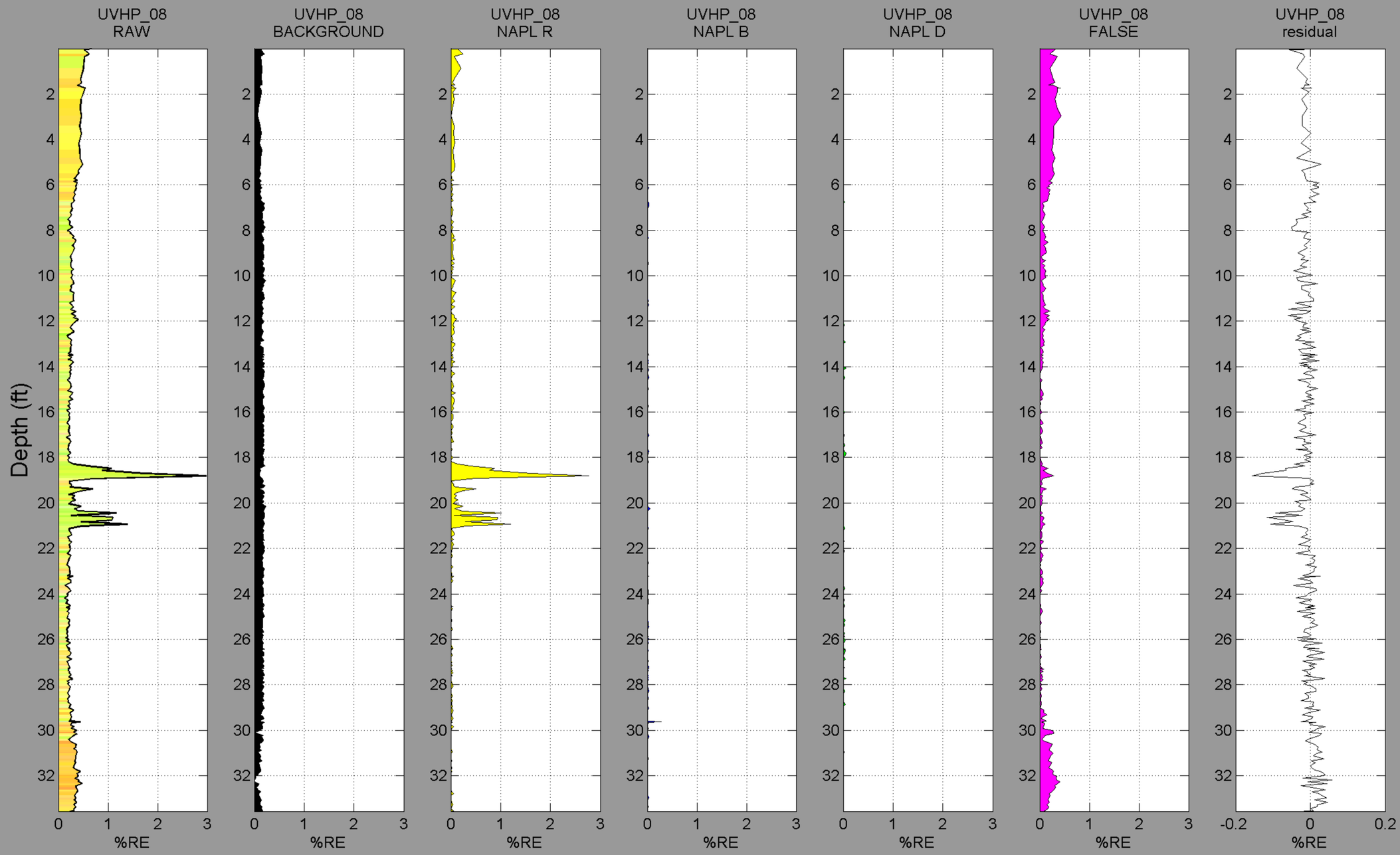


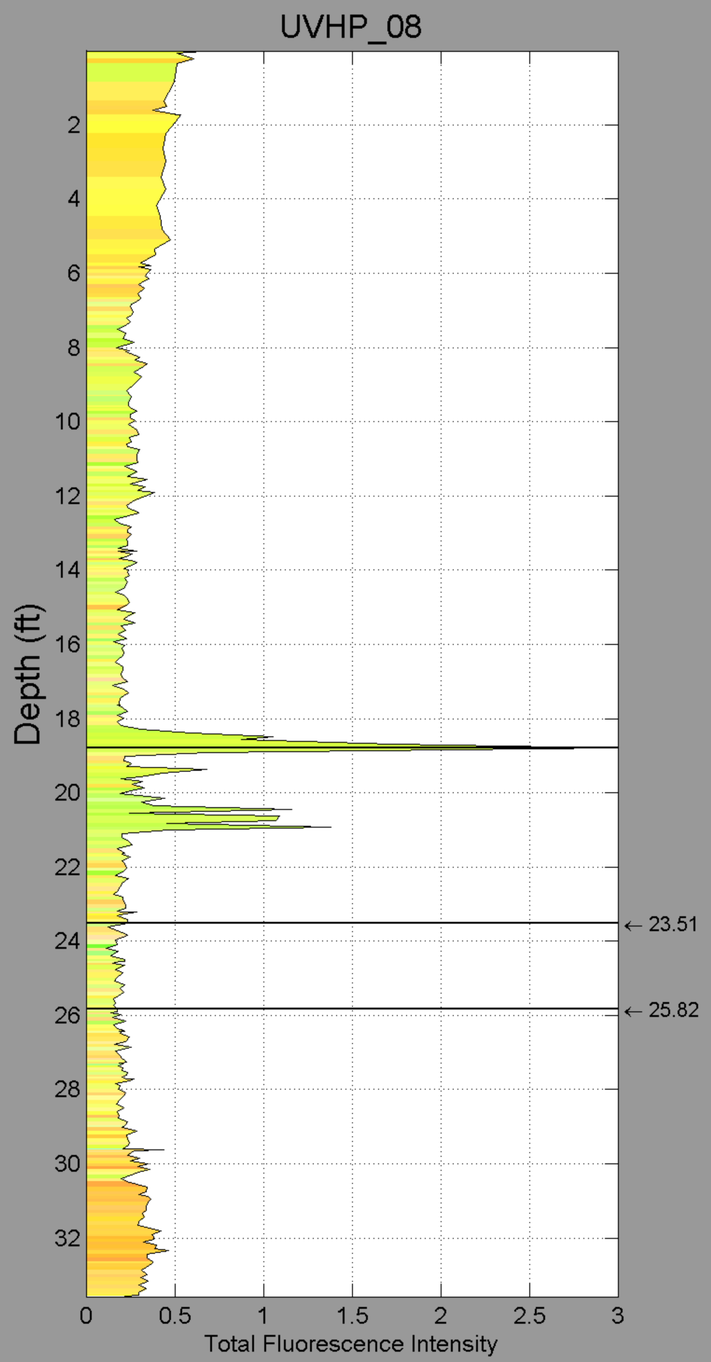


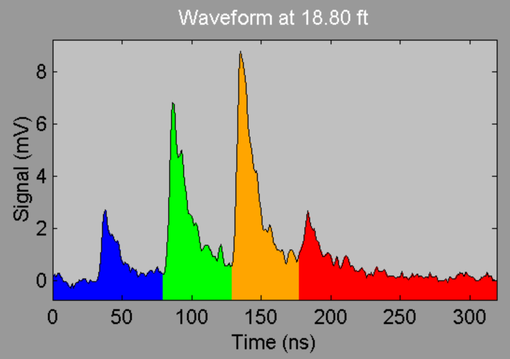




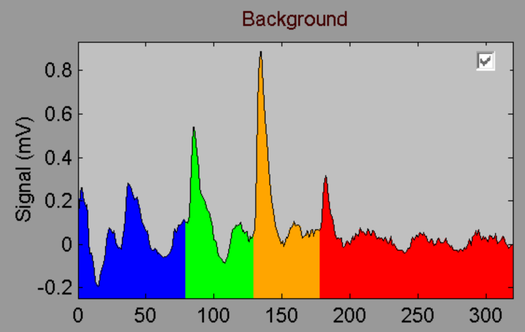
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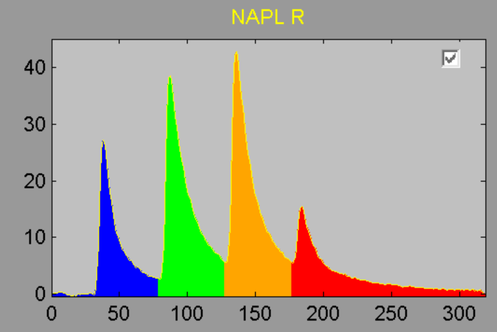

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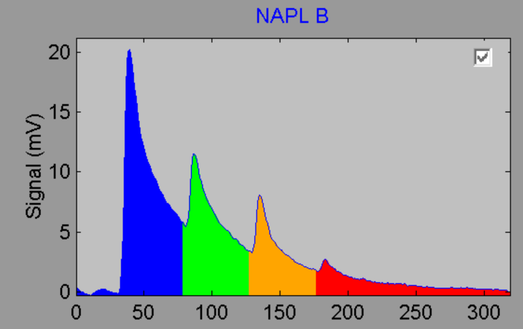


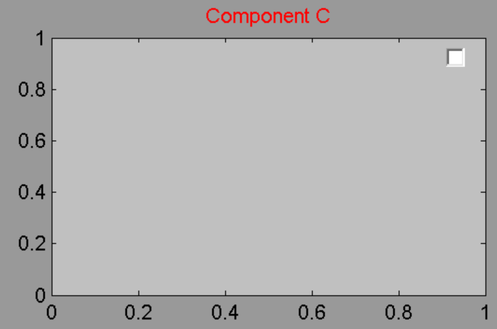


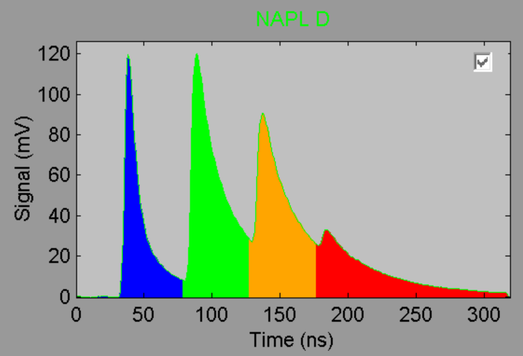


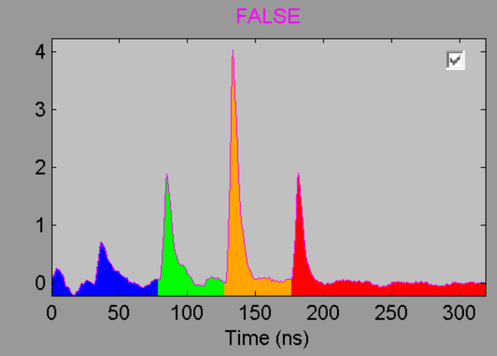




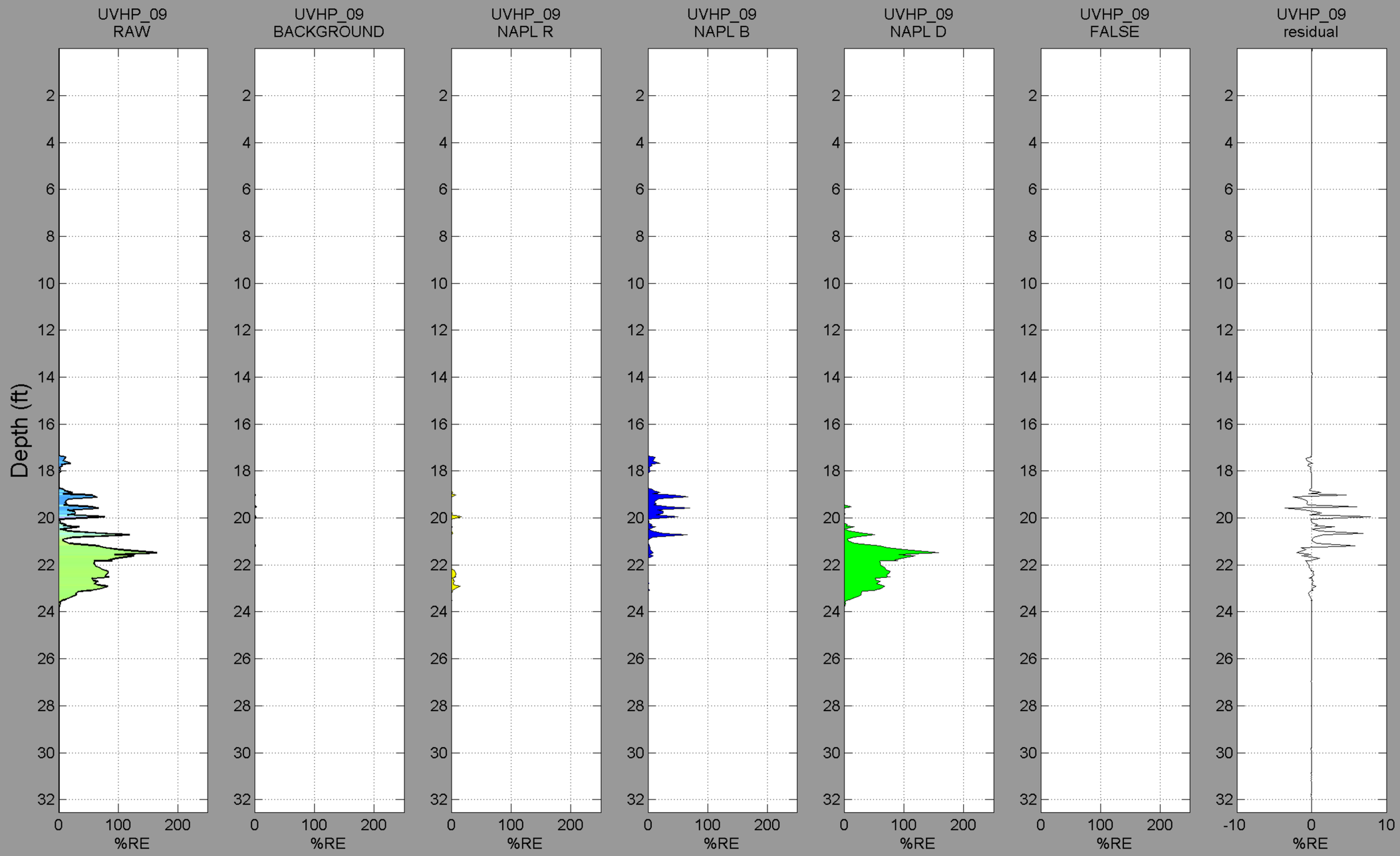




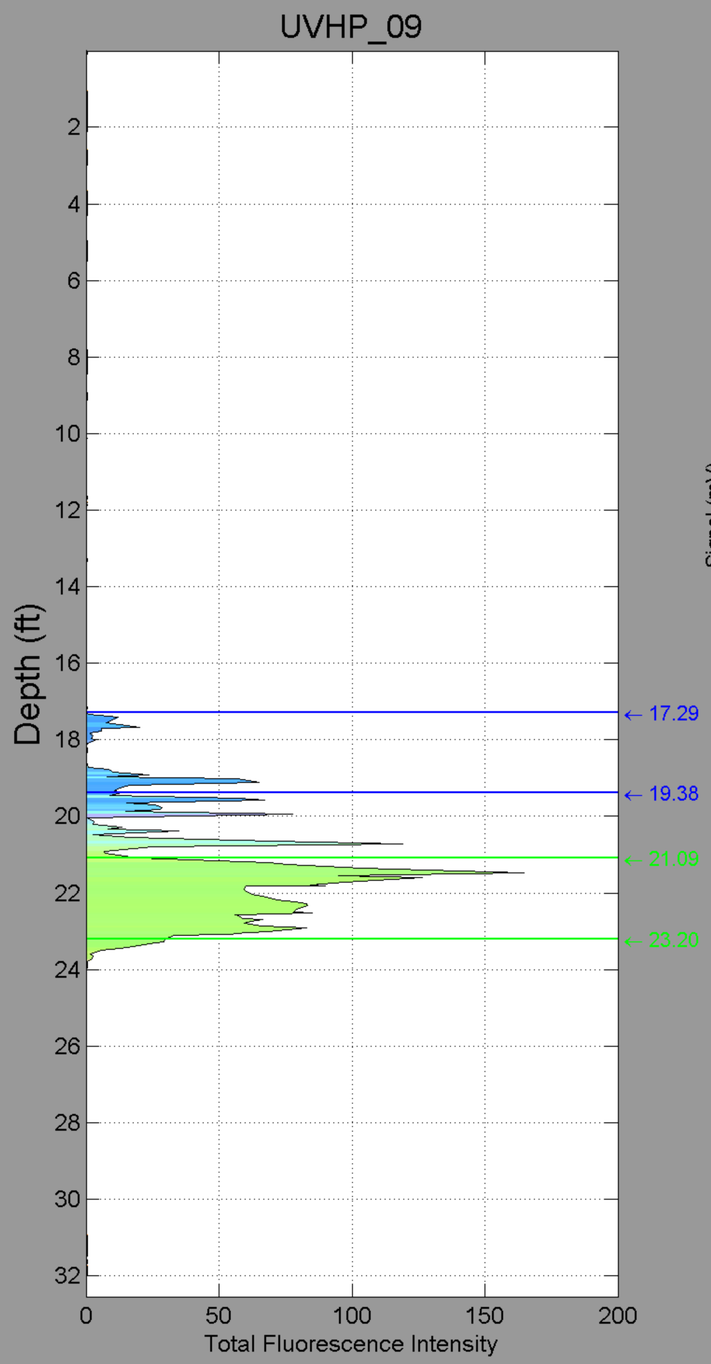


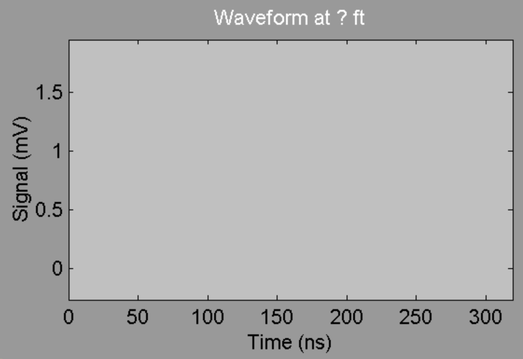


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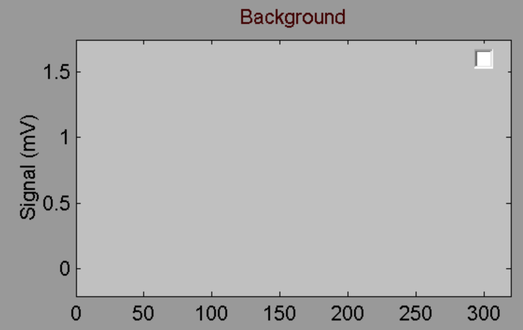


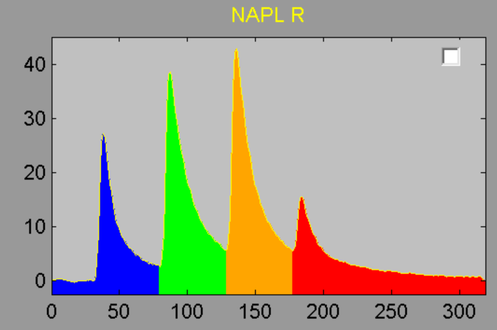
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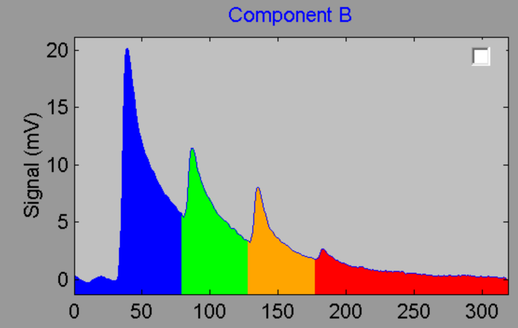


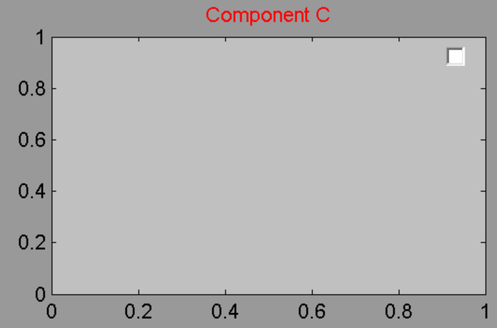


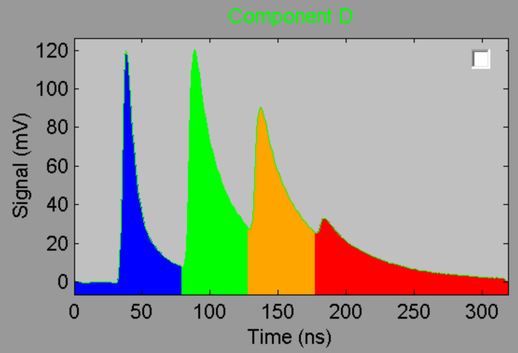


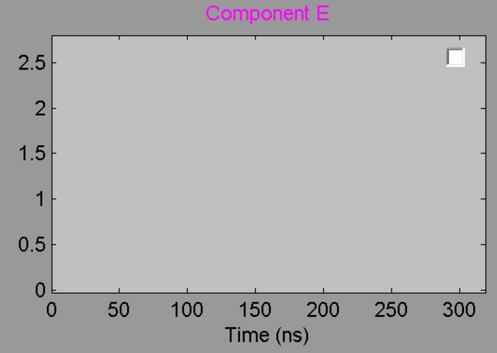




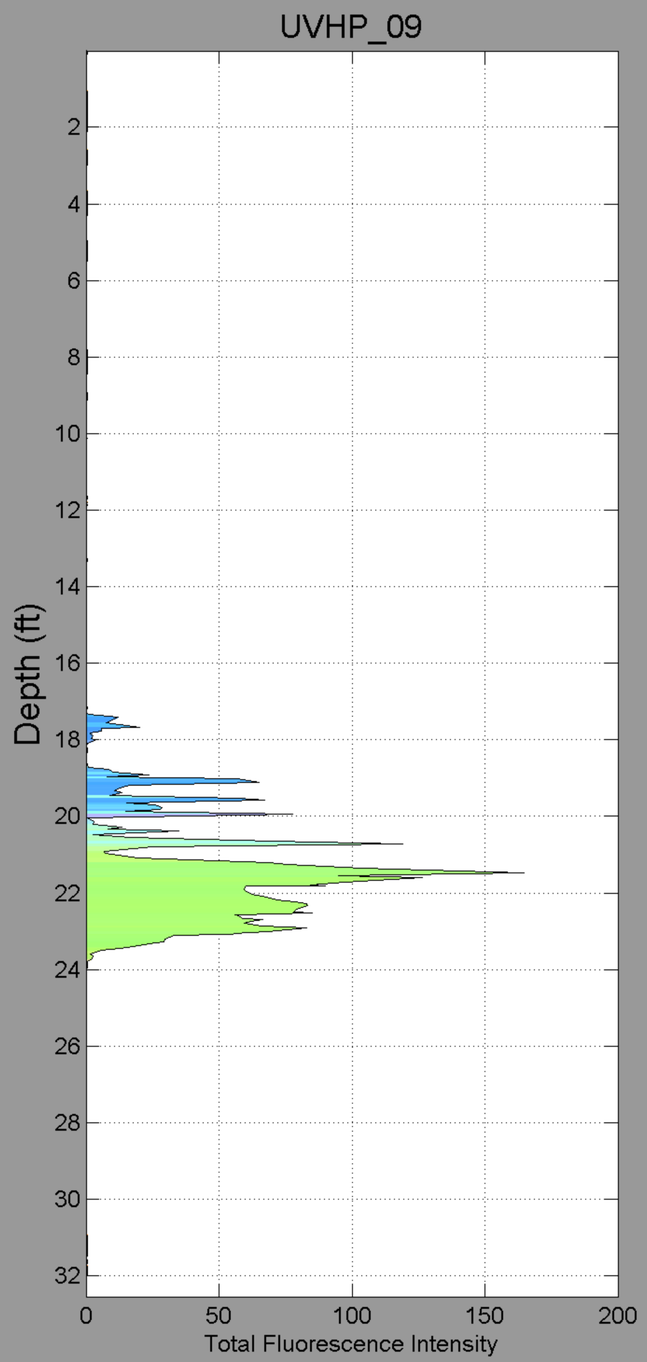


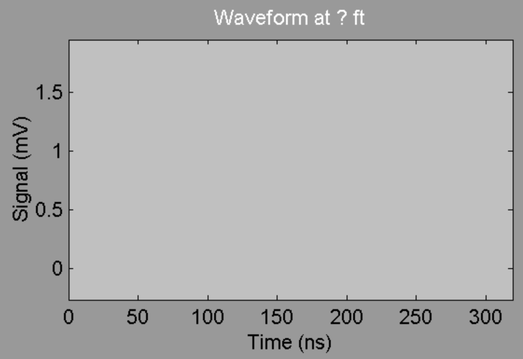




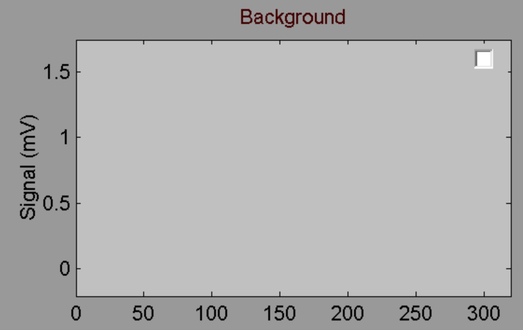


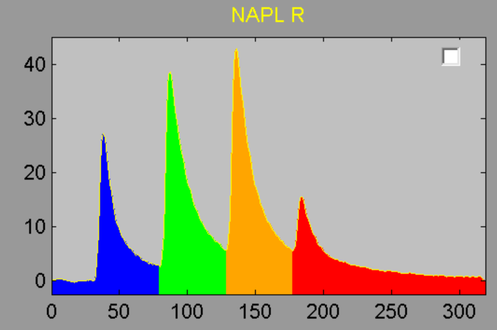
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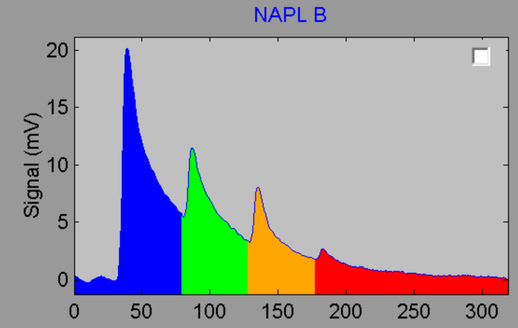


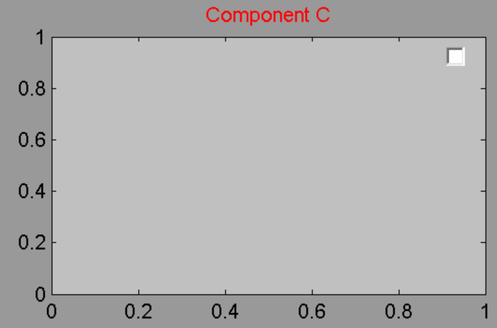


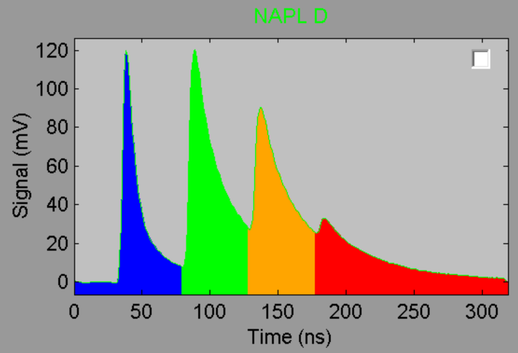


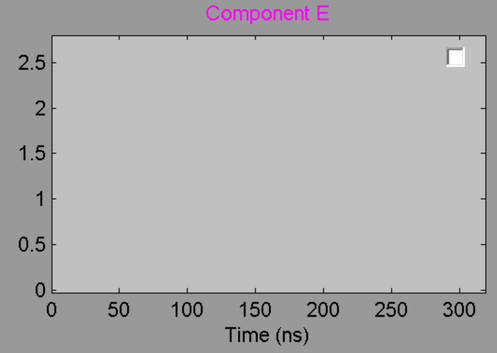




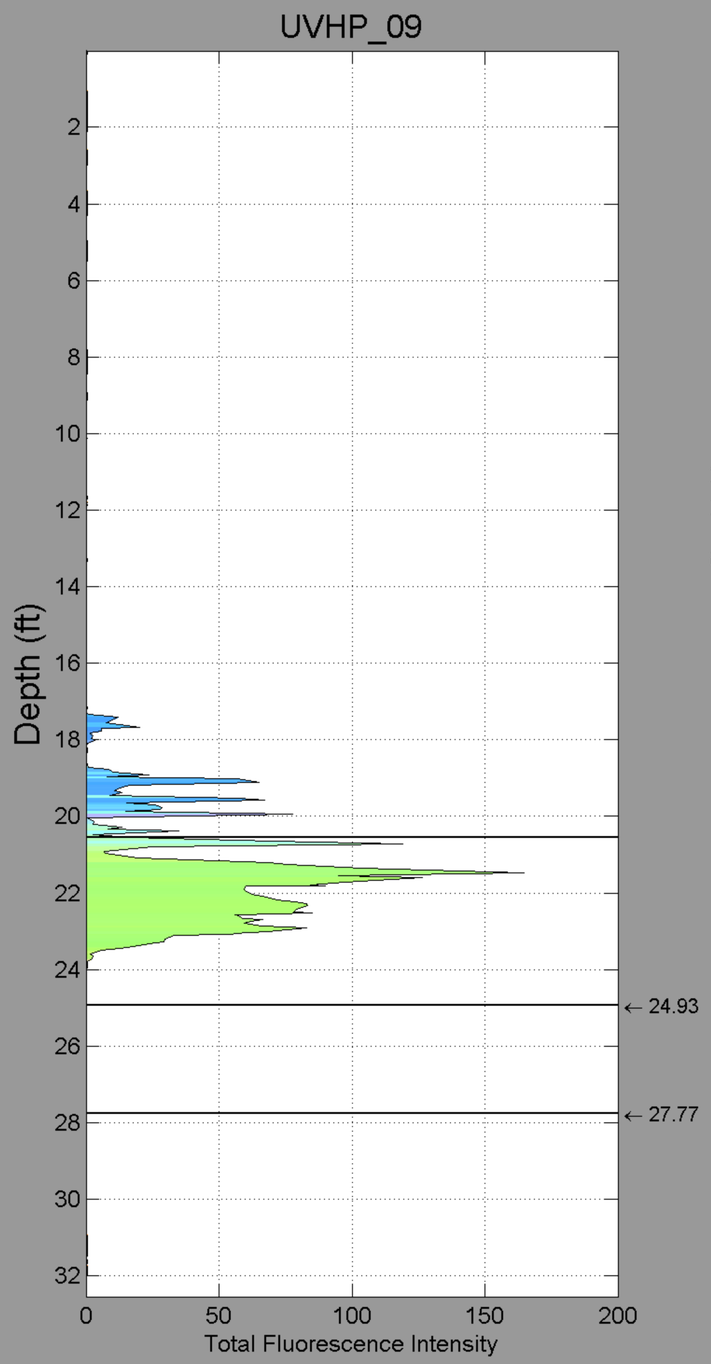


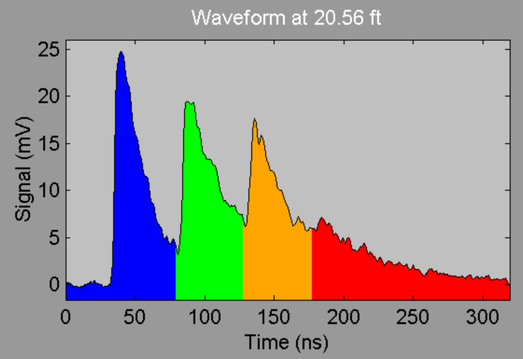




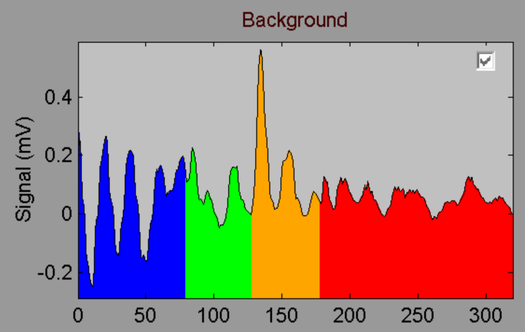


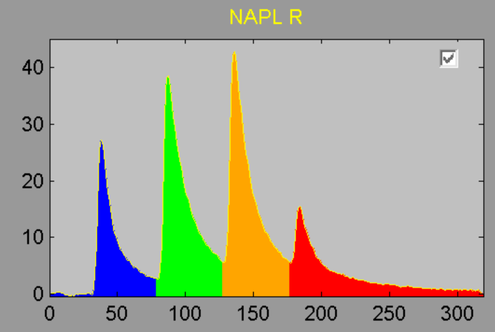
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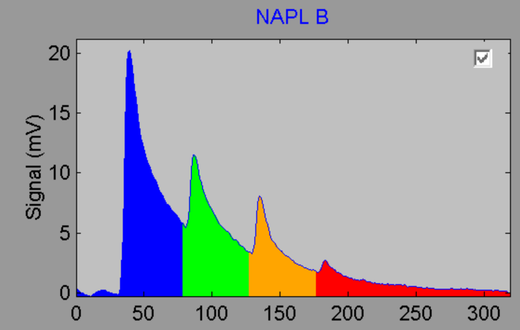


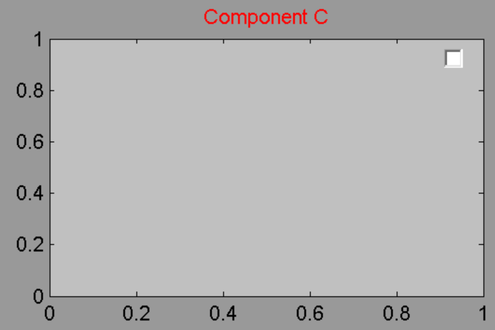


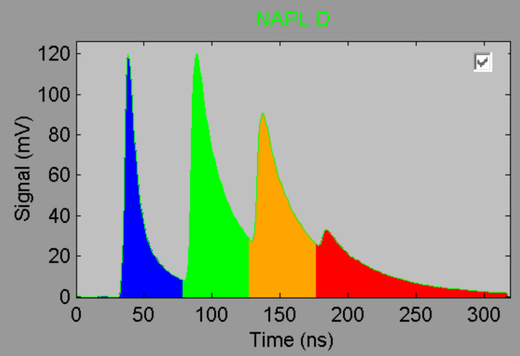


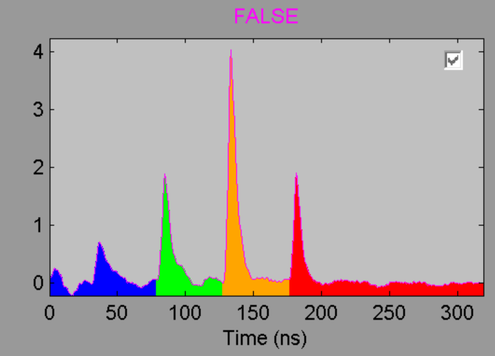




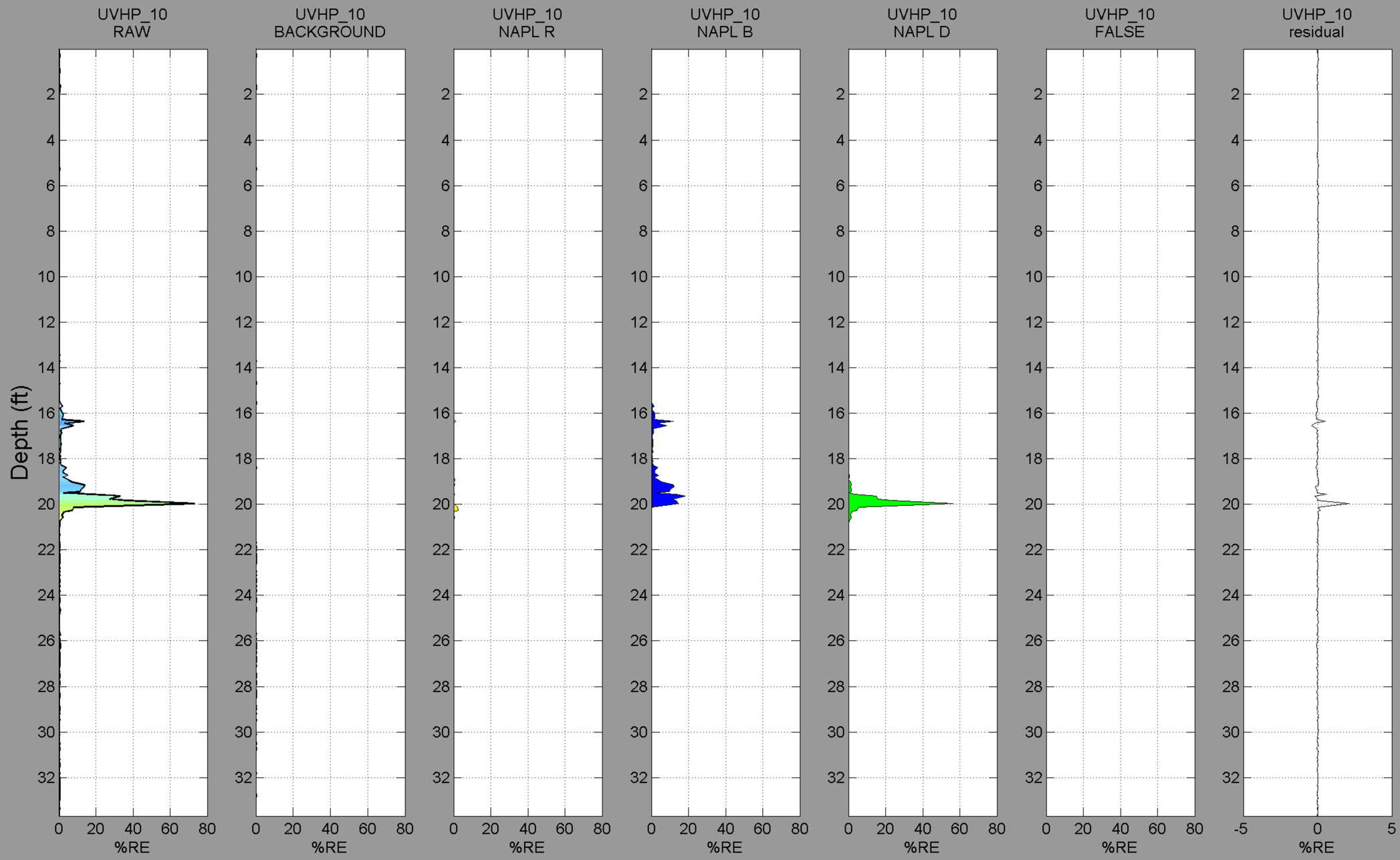




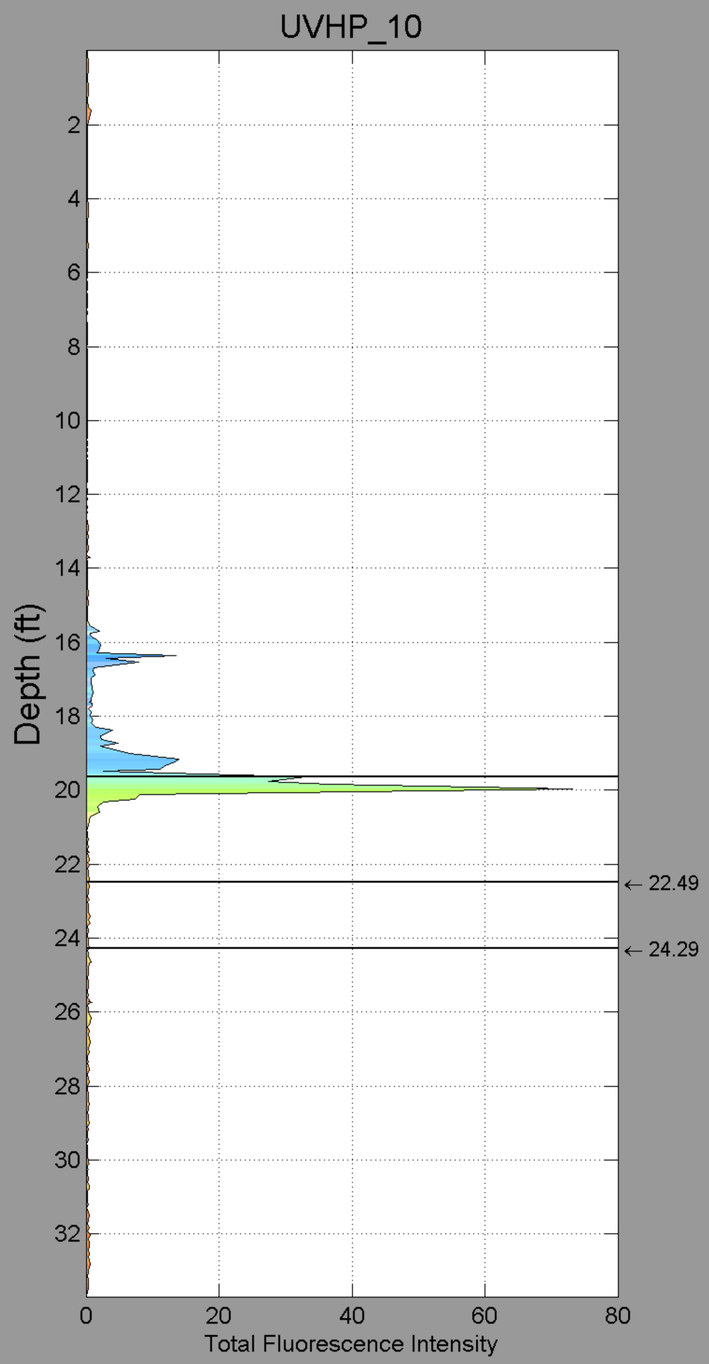


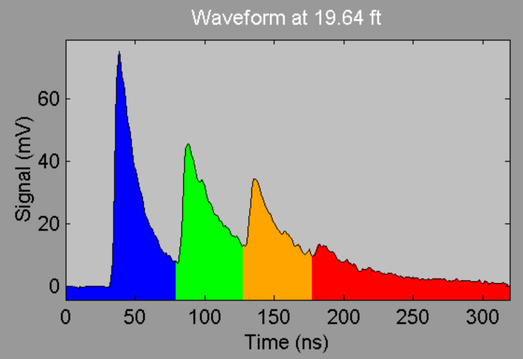


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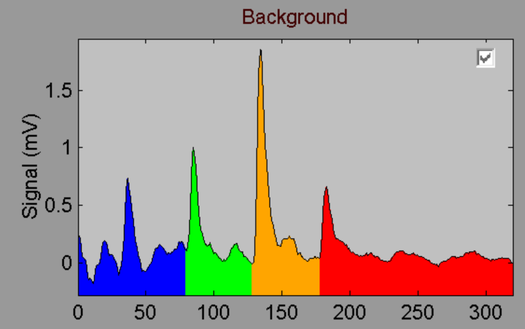


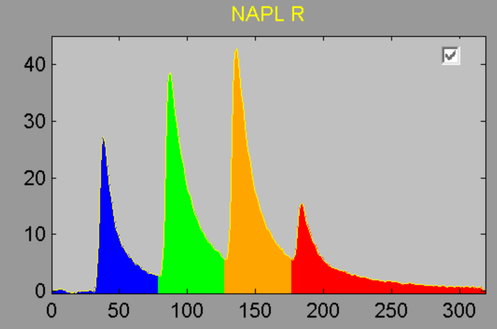
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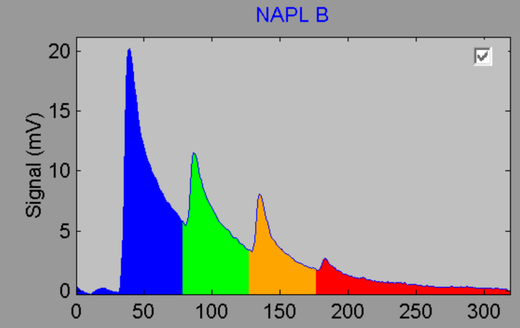


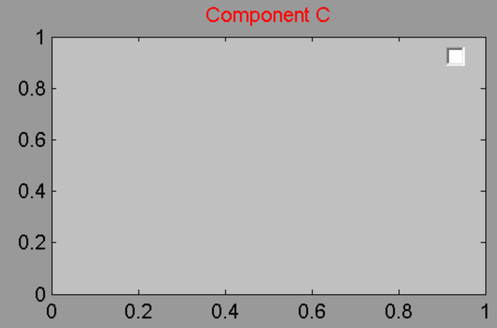


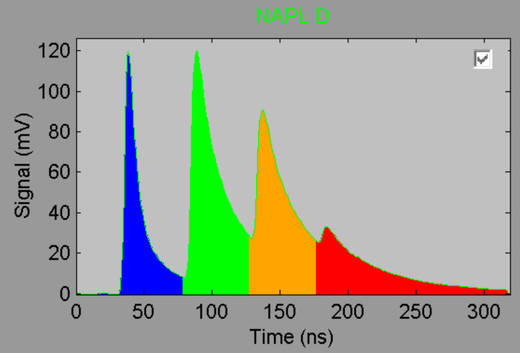


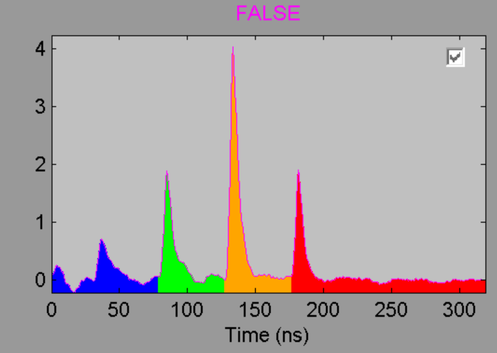




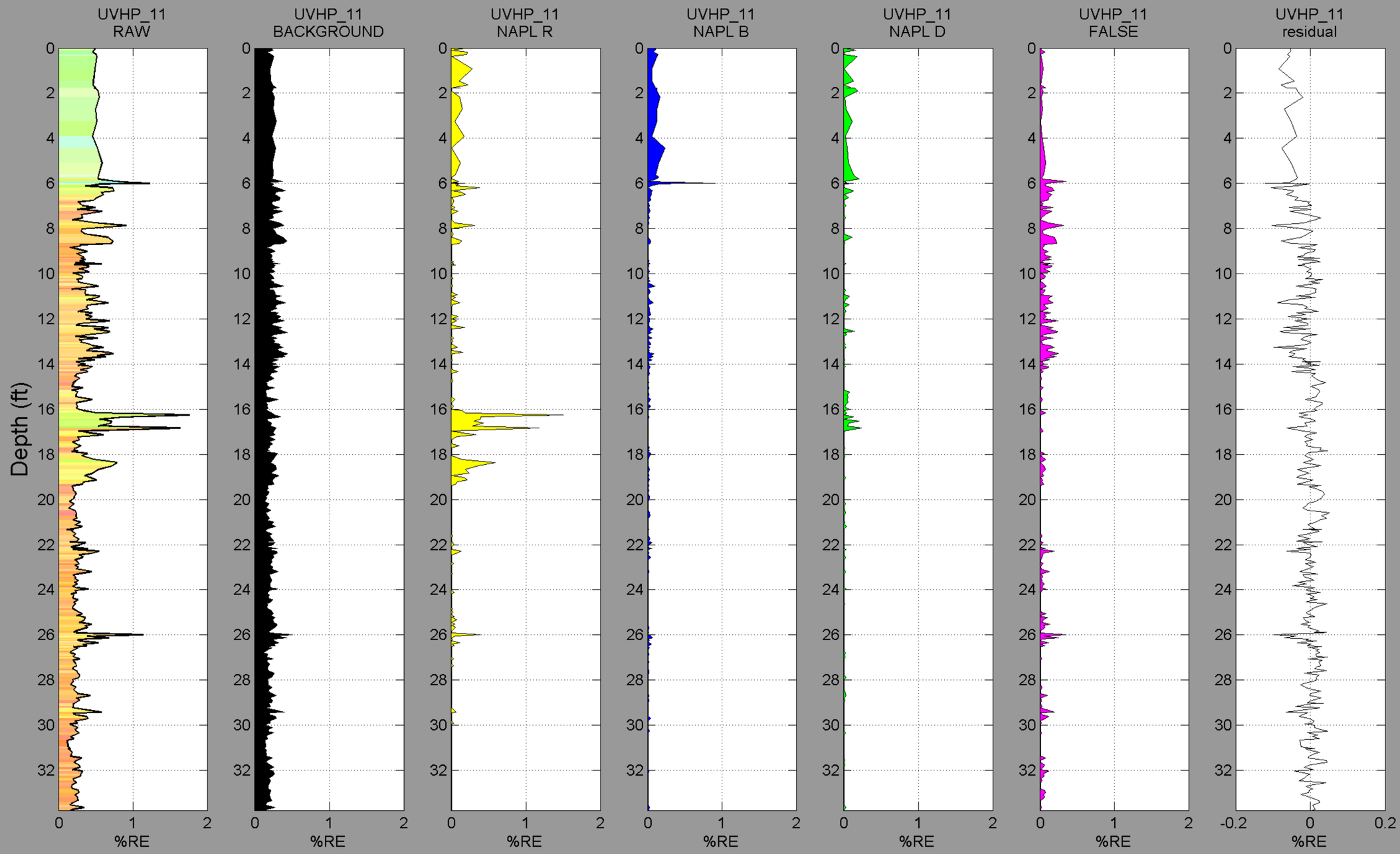


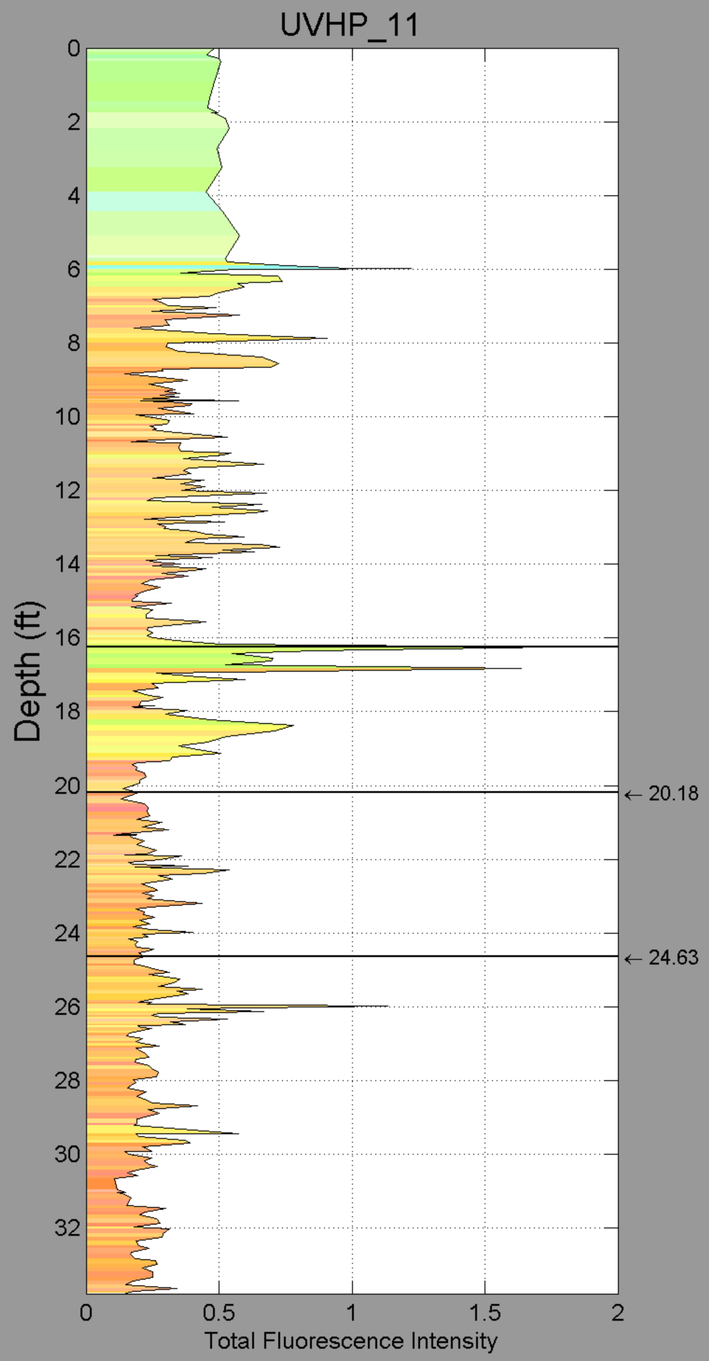


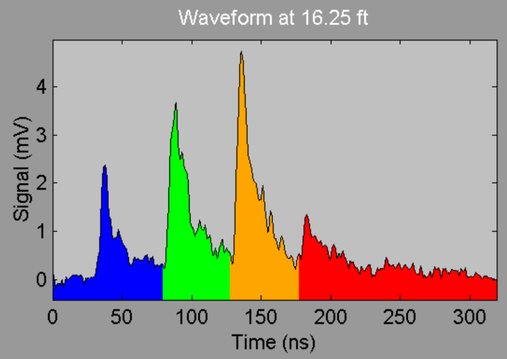




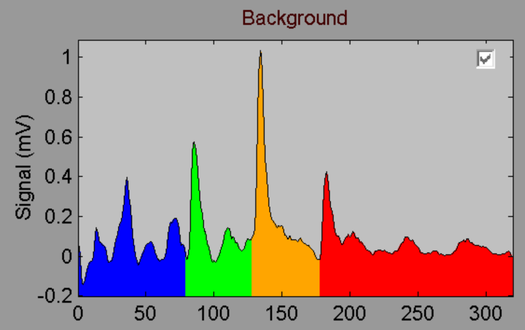
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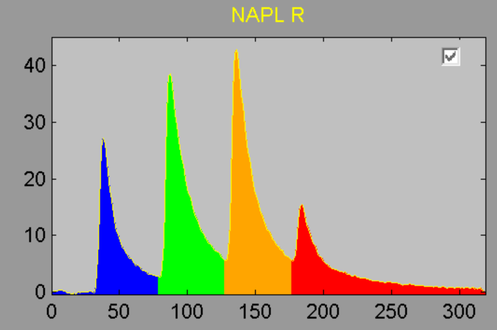

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UVHP_11
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UVHP_11
NAPL B
UVHP_11
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Depth (ft)
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%RE
%RE
%RE
%RE
%RE
%RE
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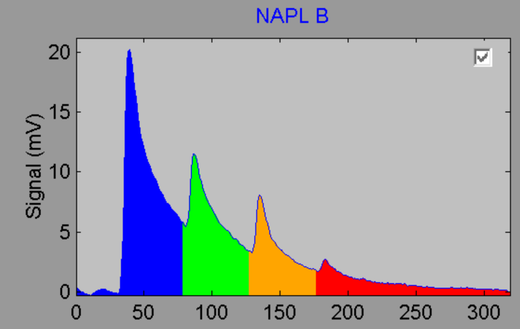


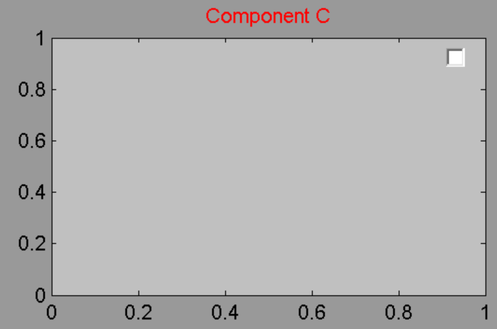


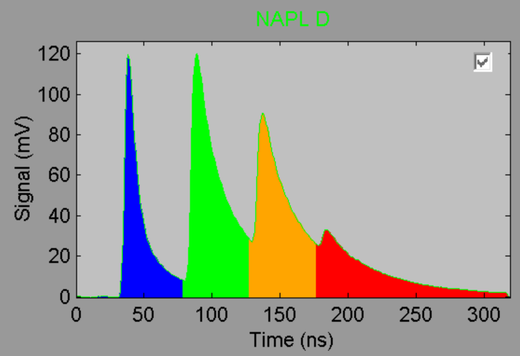


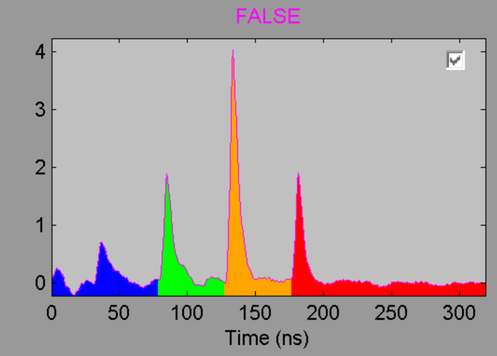




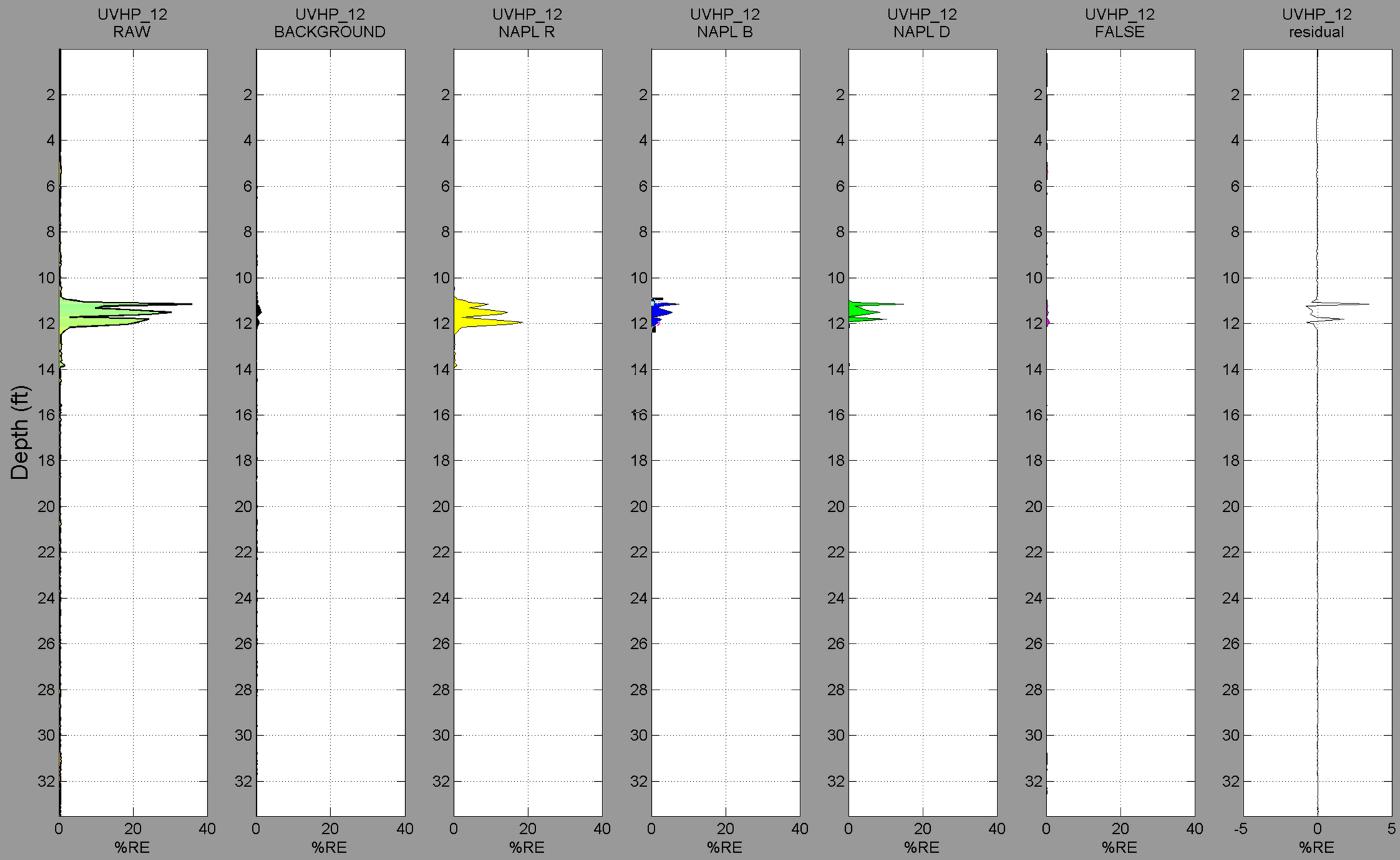




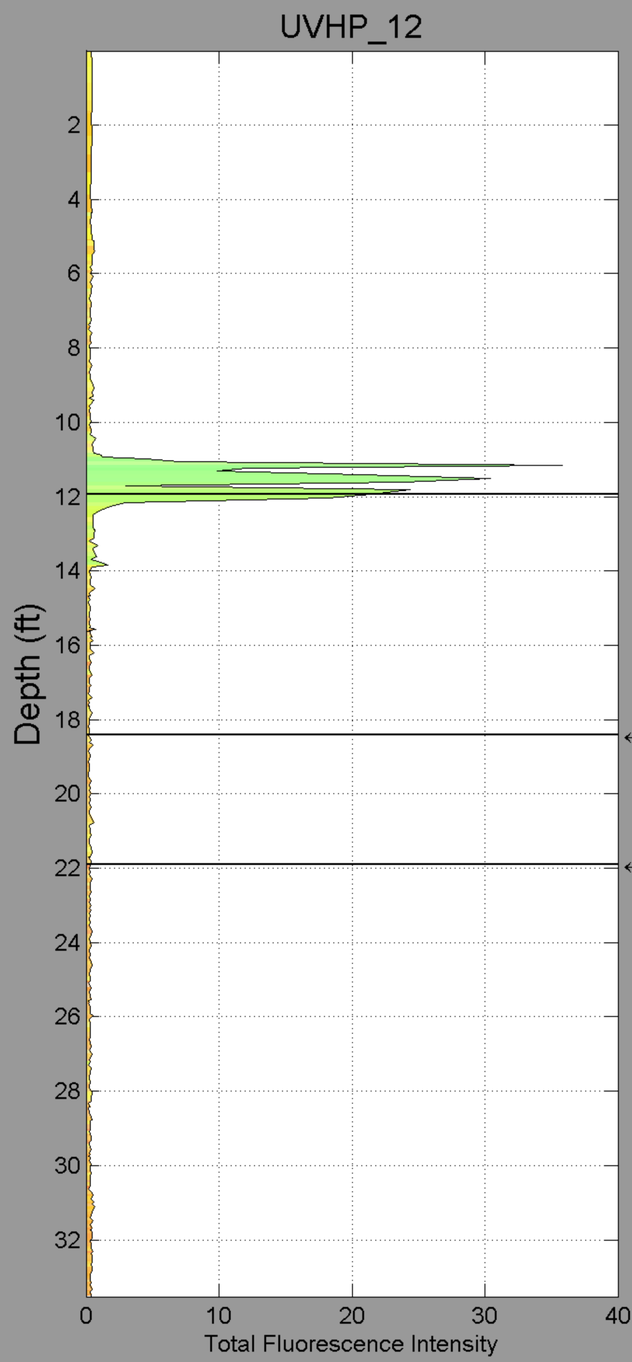


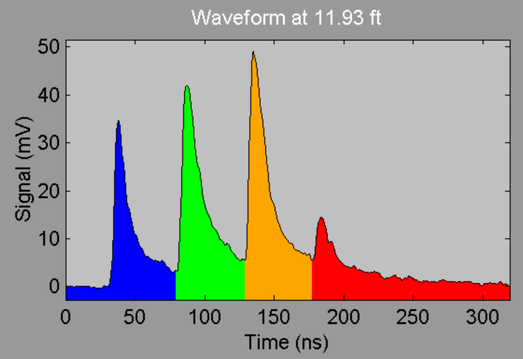


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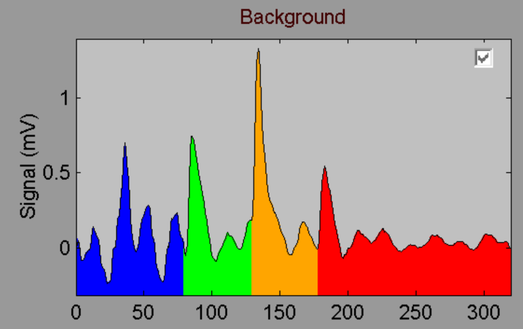


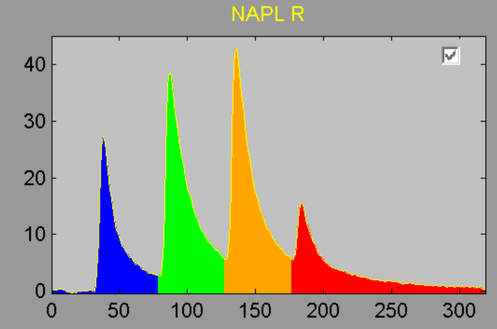
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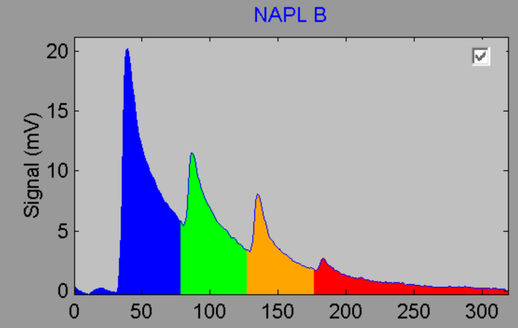


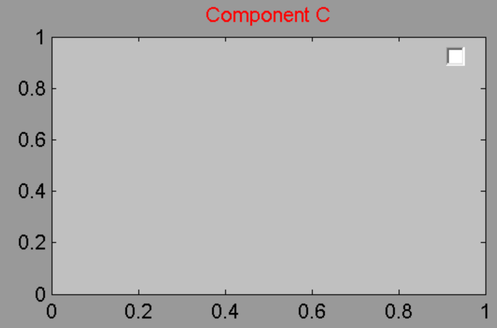


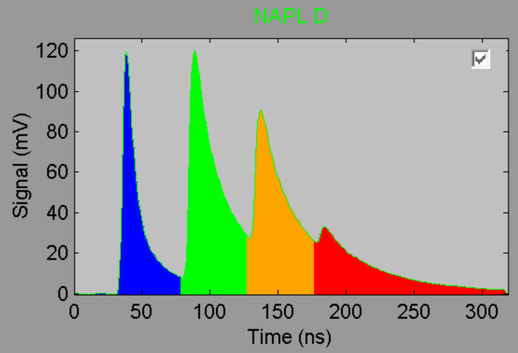


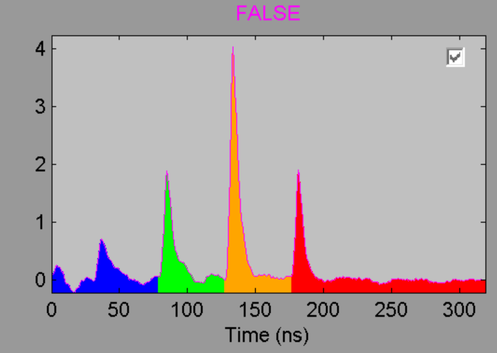




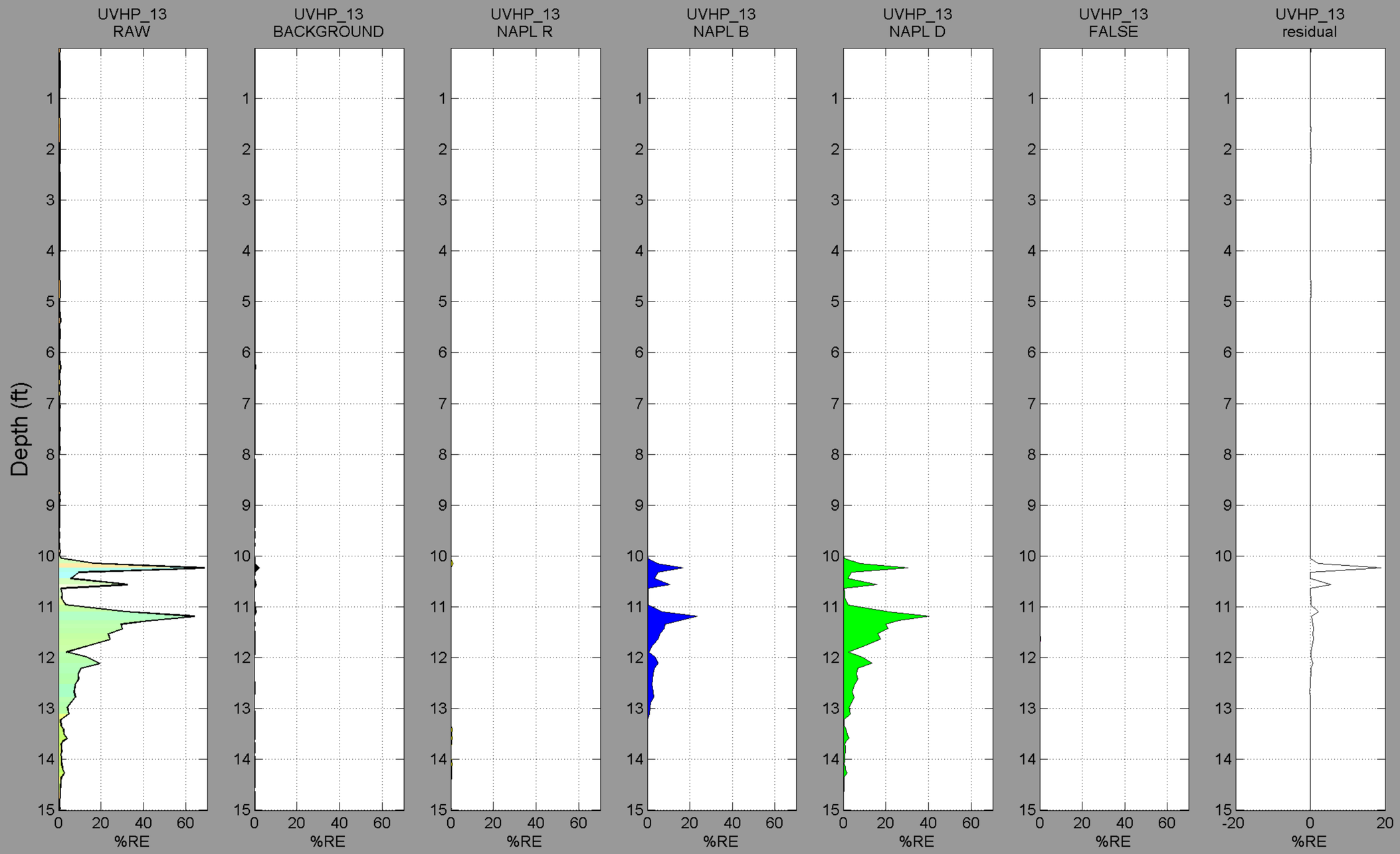




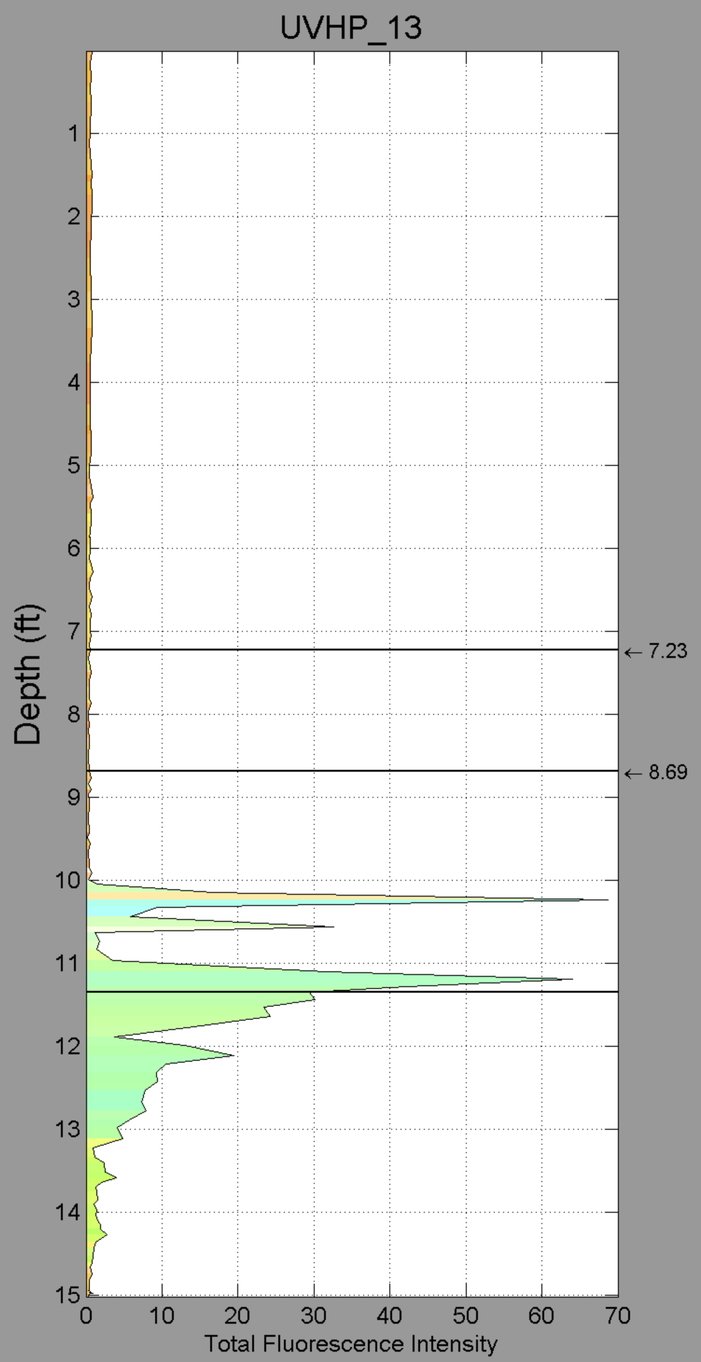


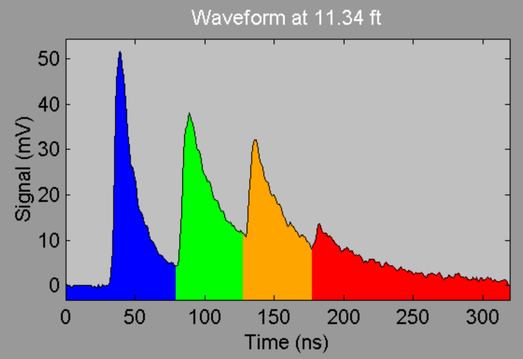


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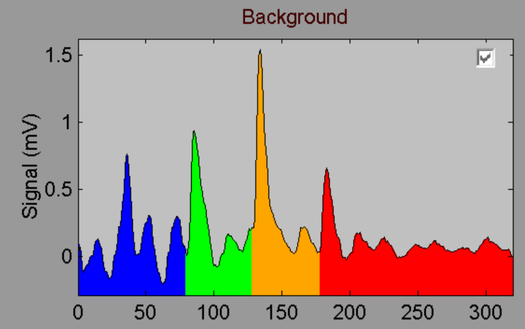


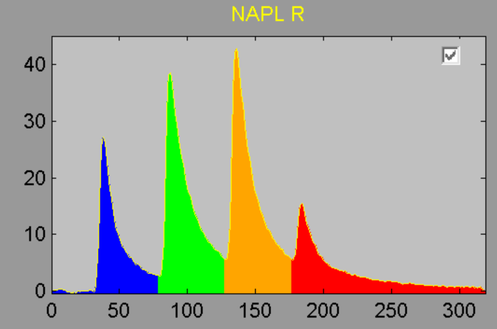
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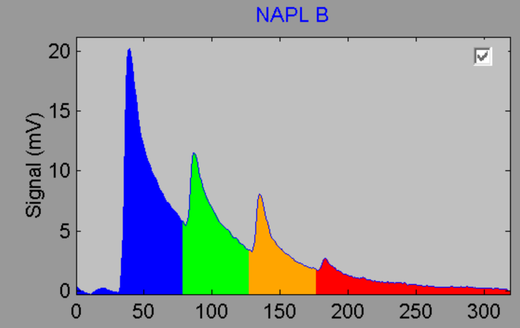


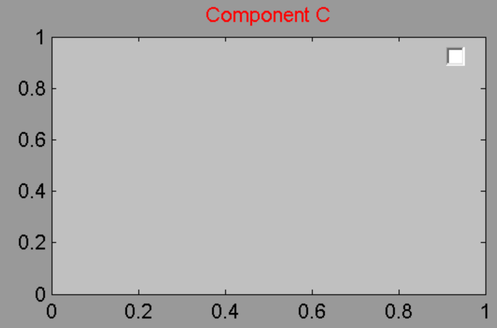


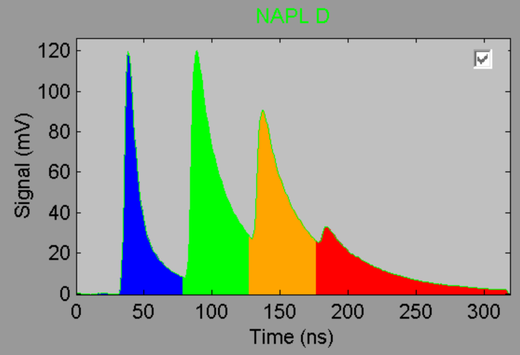


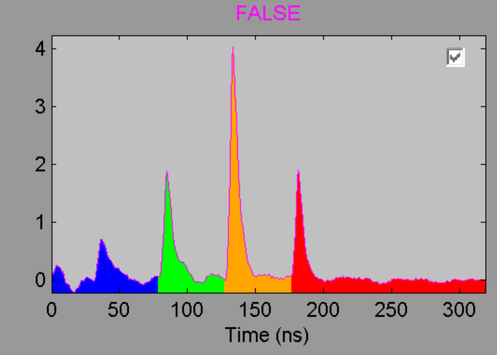




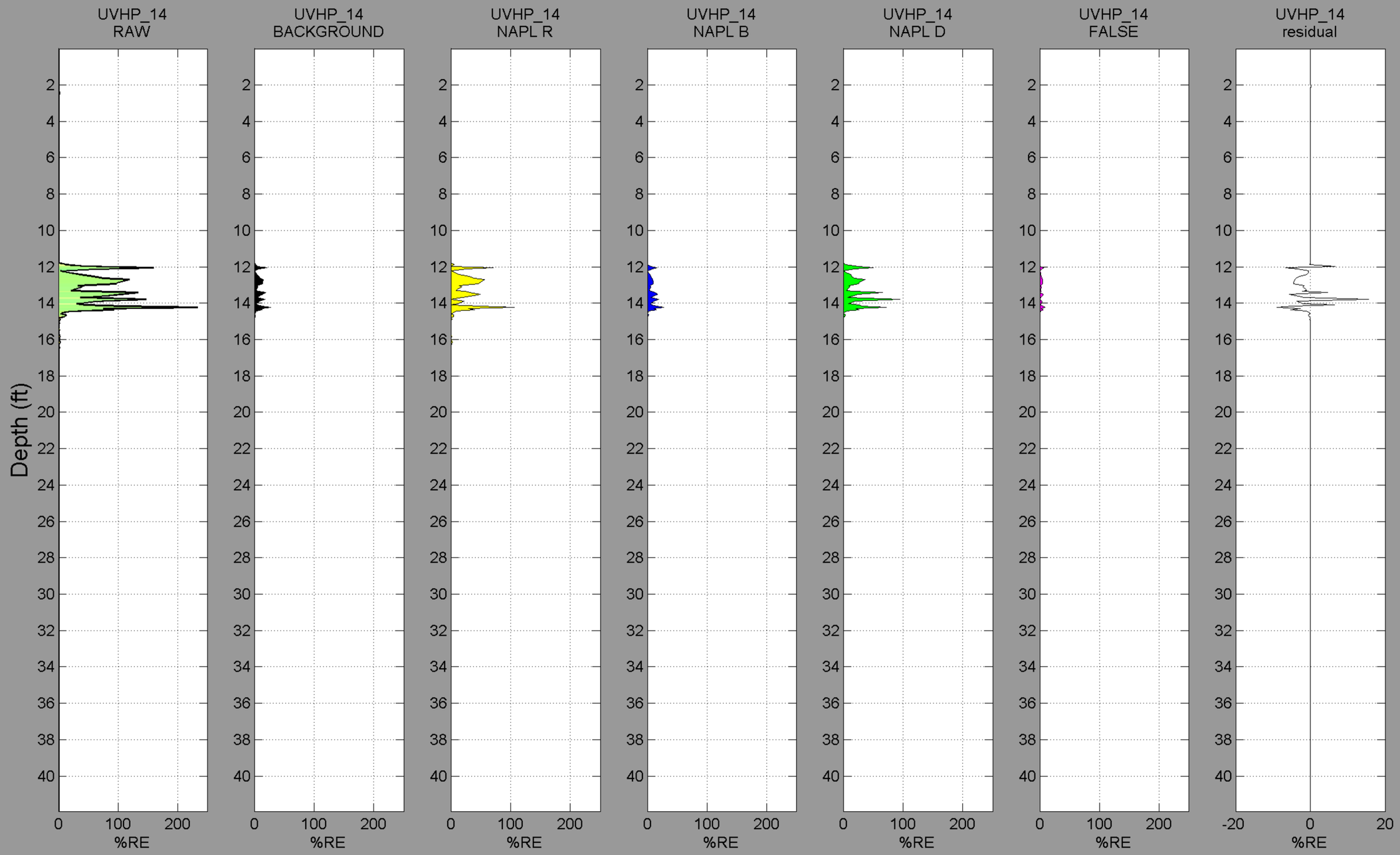




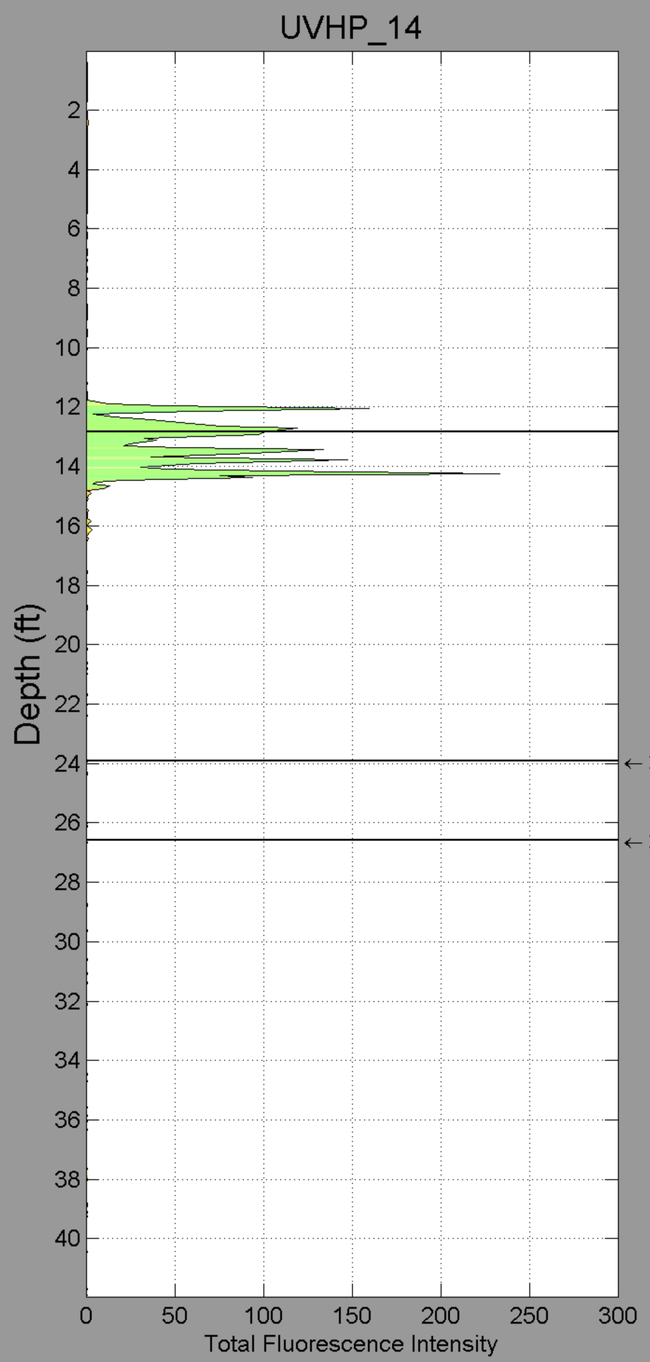


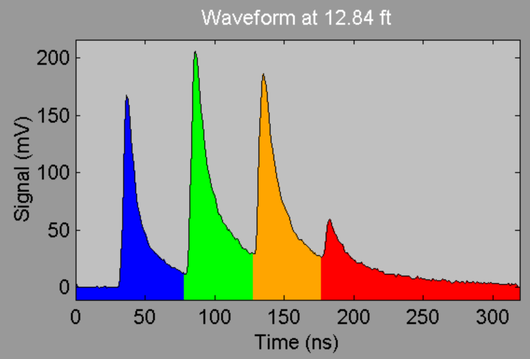


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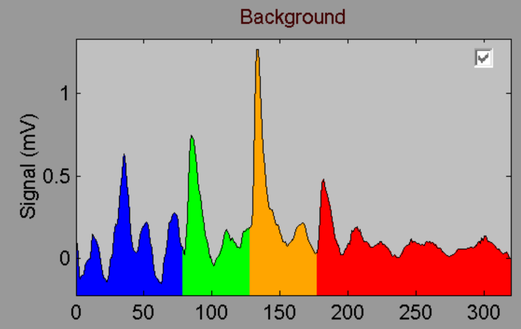


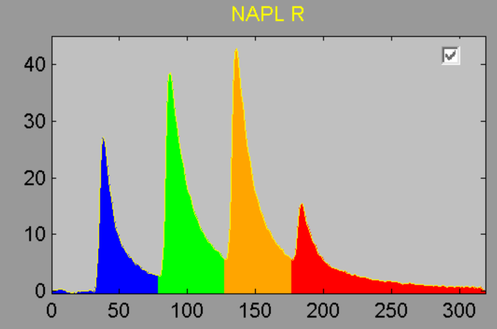
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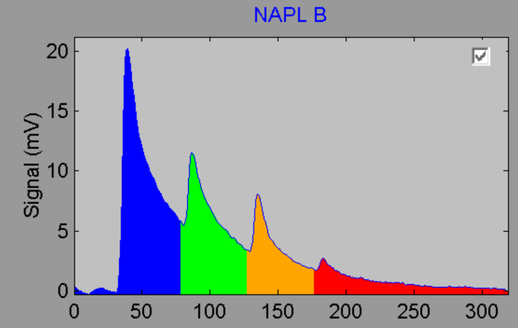


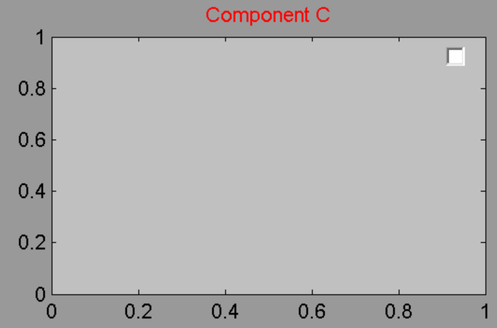


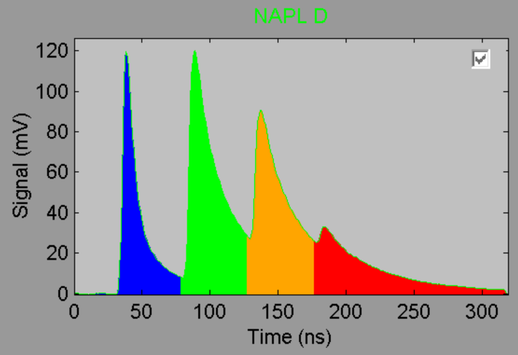


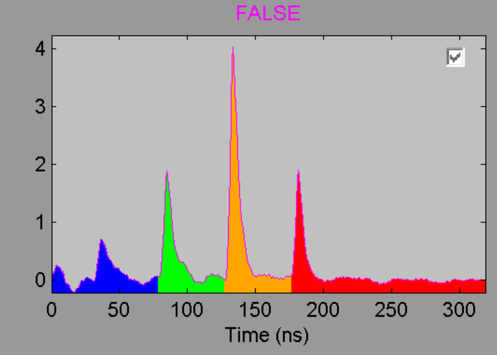




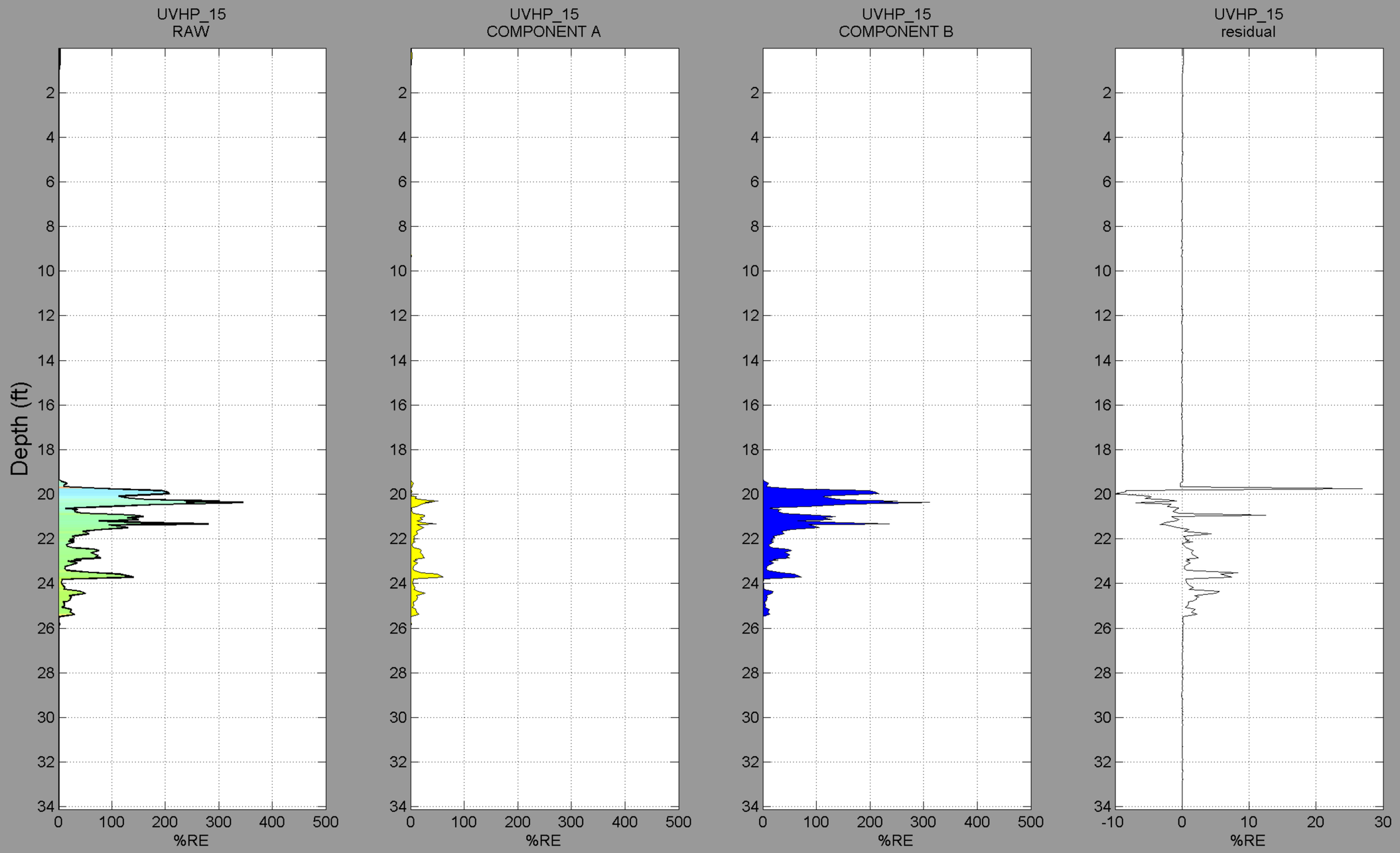


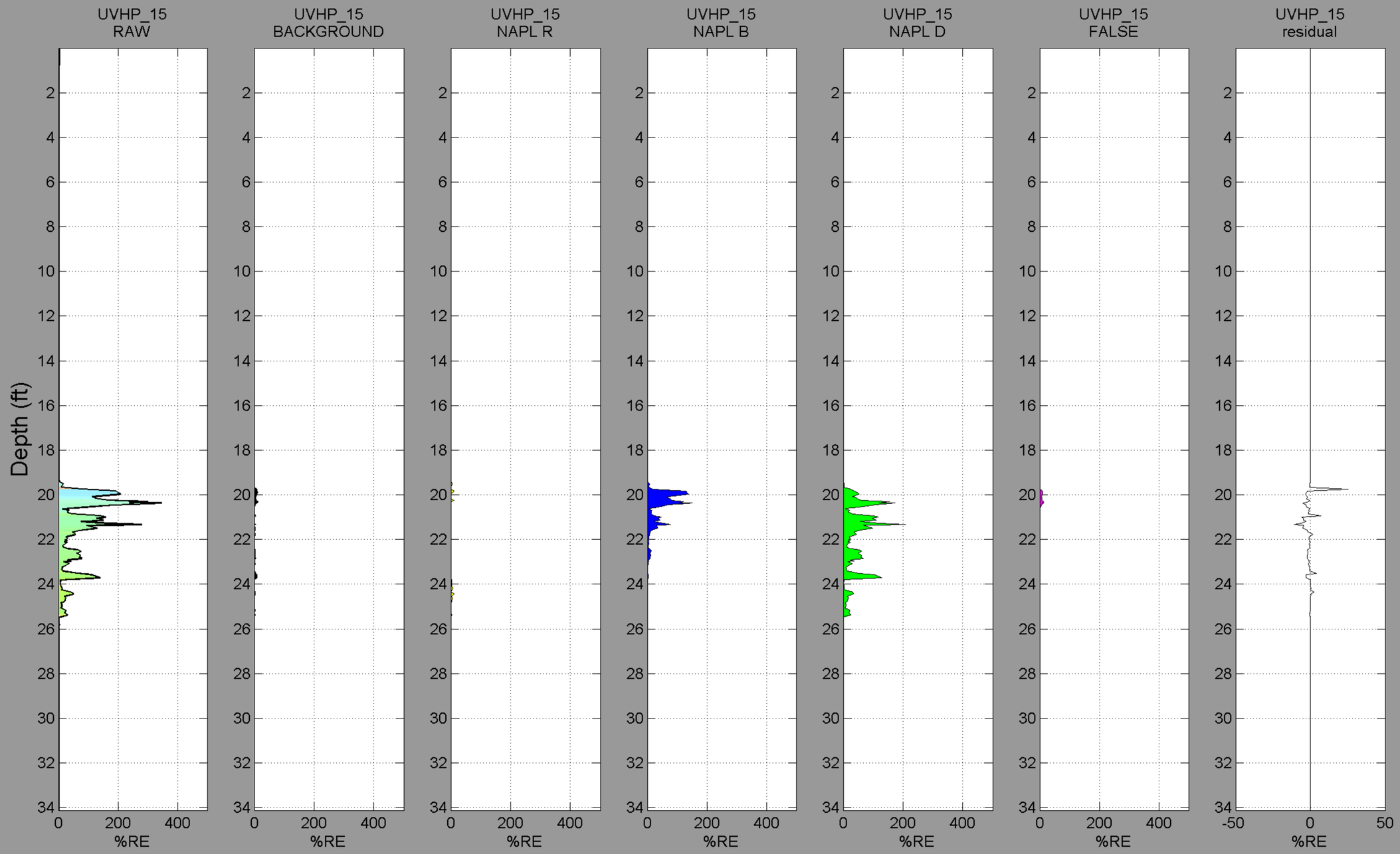


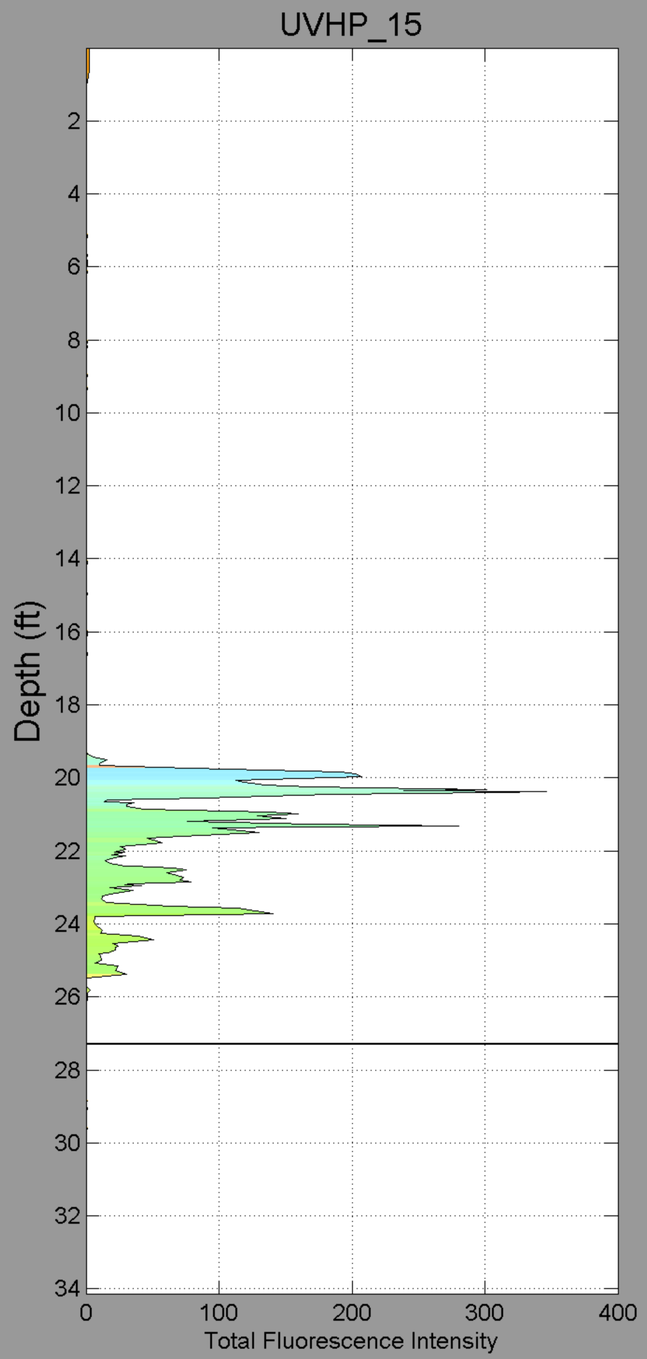


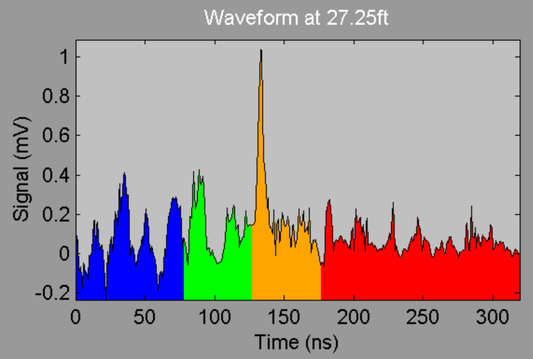


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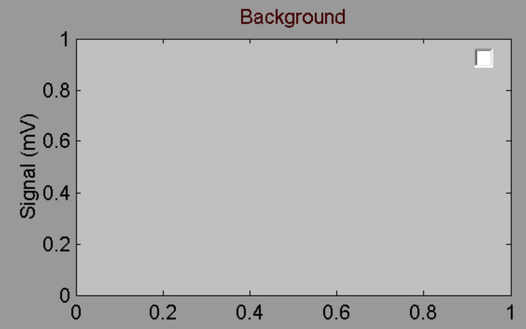

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UVHP_15
COMPONENT A
UVHP_15
COMPONENT B
UVHP_15
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Depth (ft)
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6
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12
14
16
18
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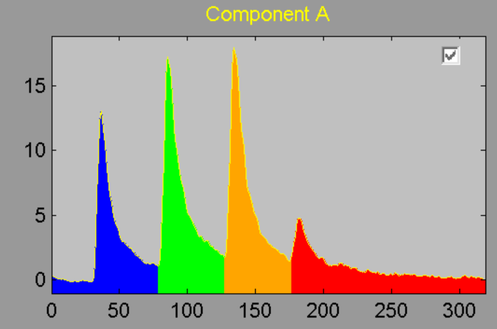

UVHP_15
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UVHP_15
BACKGROUND
UVHP_15
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UVHP_15
NAPL B
UVHP_15
NAPL D
UVHP_15
FALSE
UVHP_15
residual
Depth (ft)
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
0
200
400
-50
0
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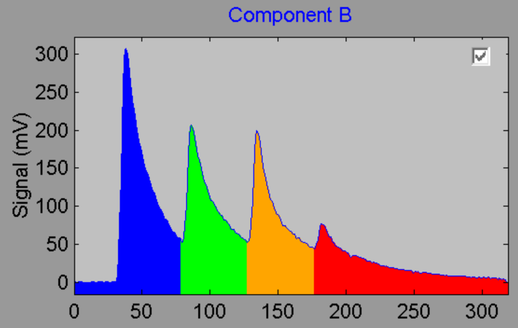


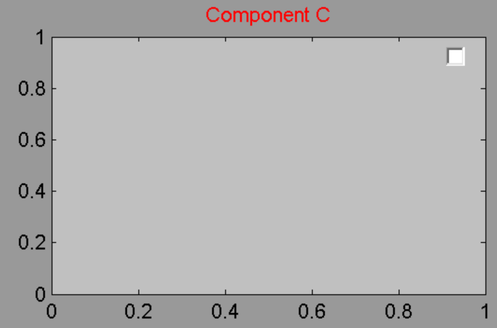


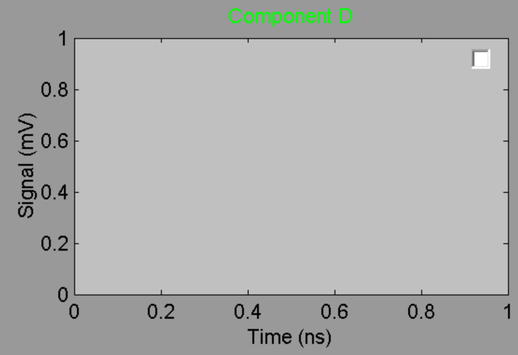


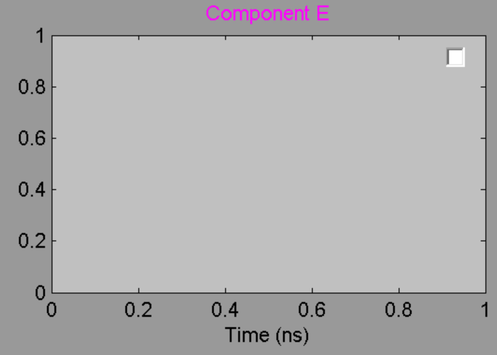




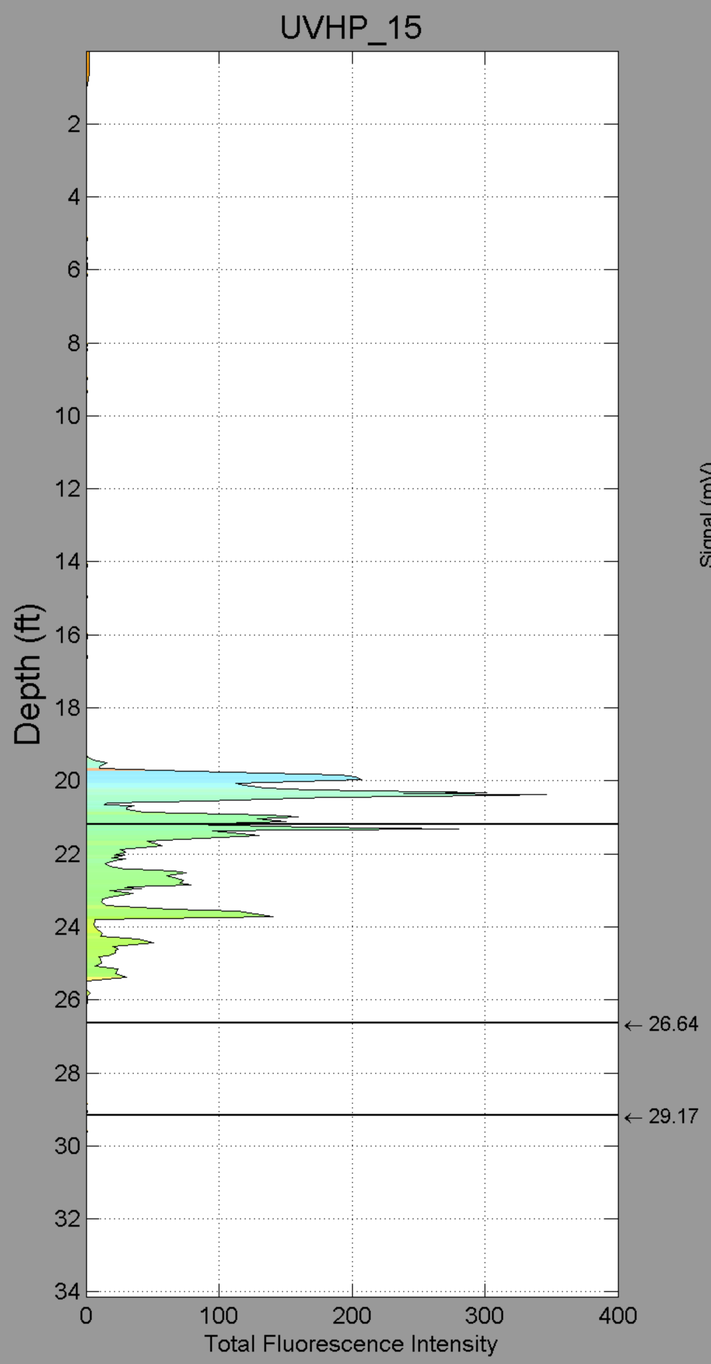


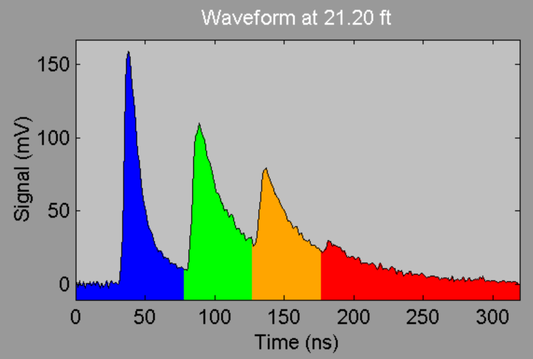




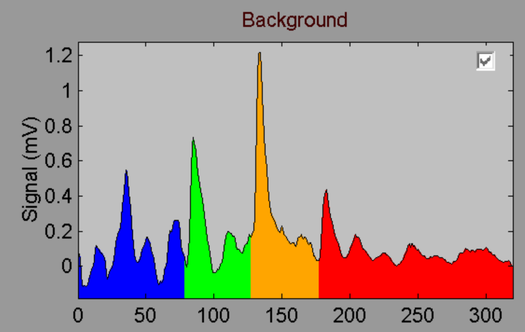


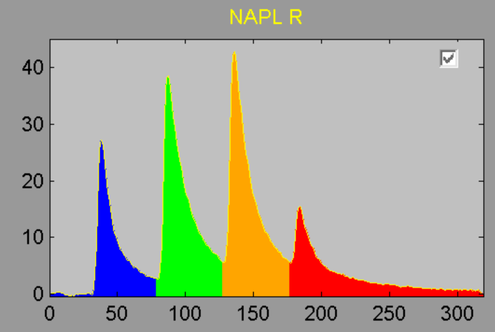
ADVANCED DATA ANALYSIS - WWW.DAKOTATECHNOLOGIES.COM

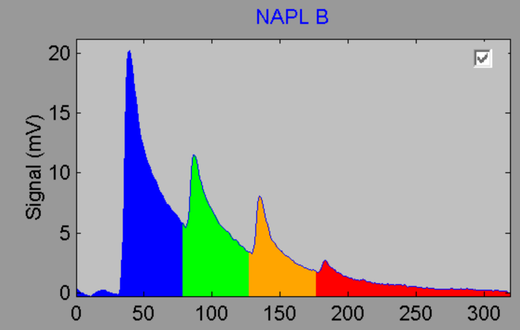


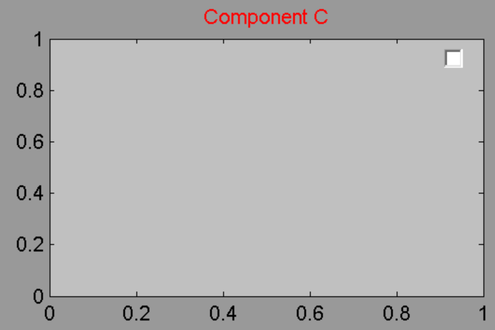


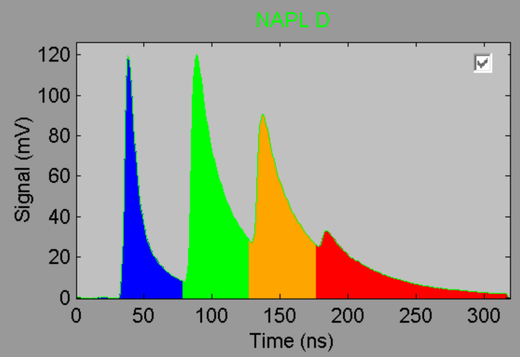


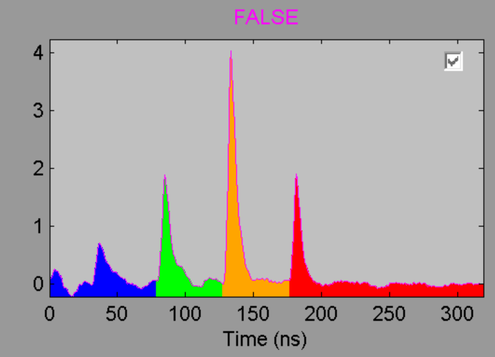




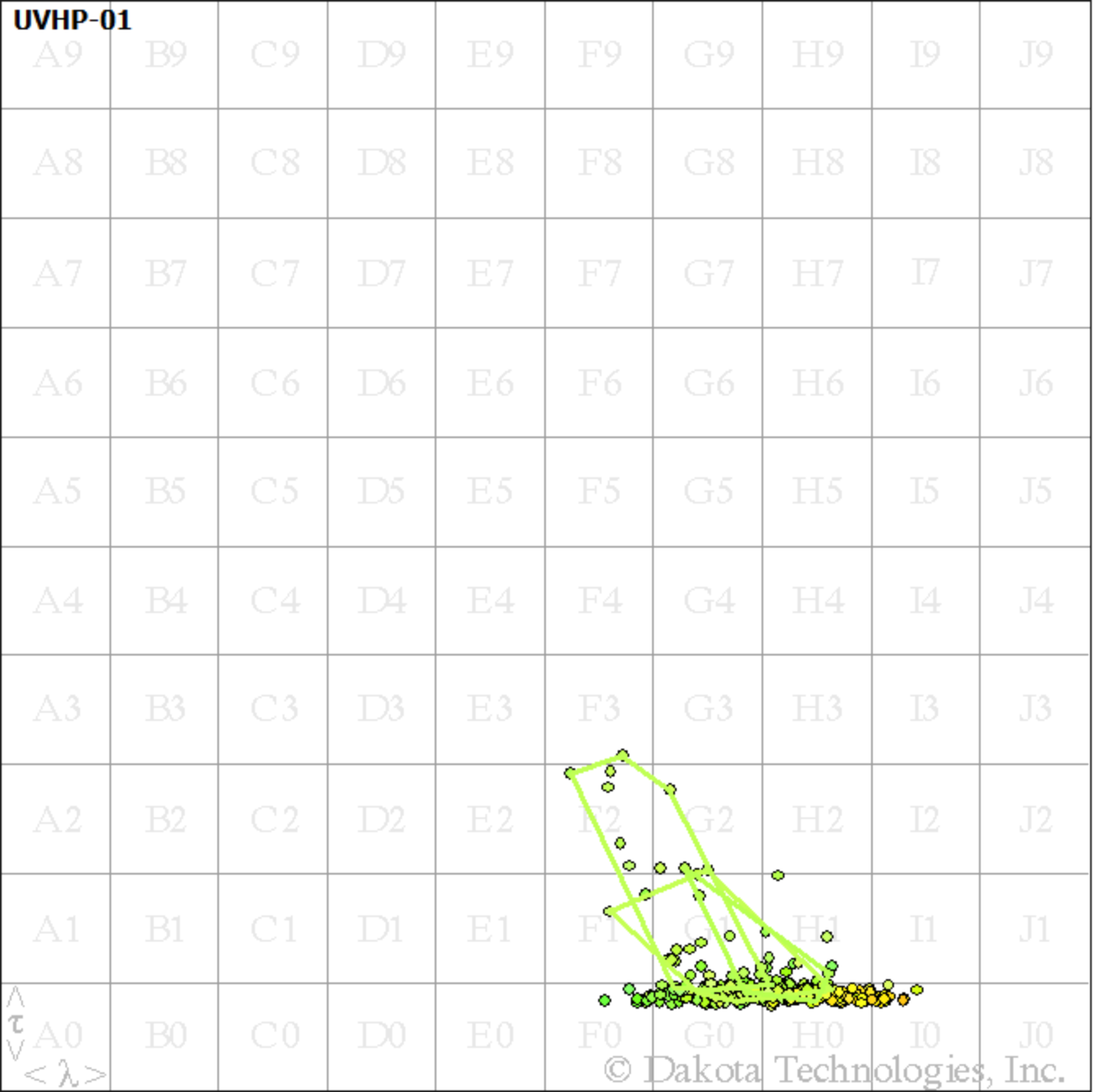


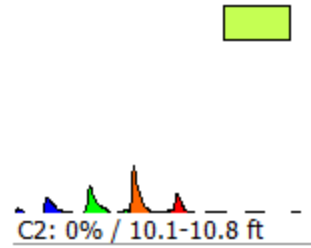


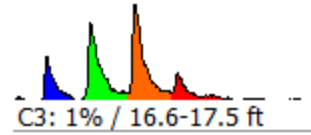


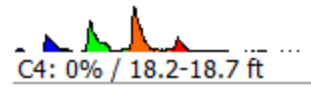


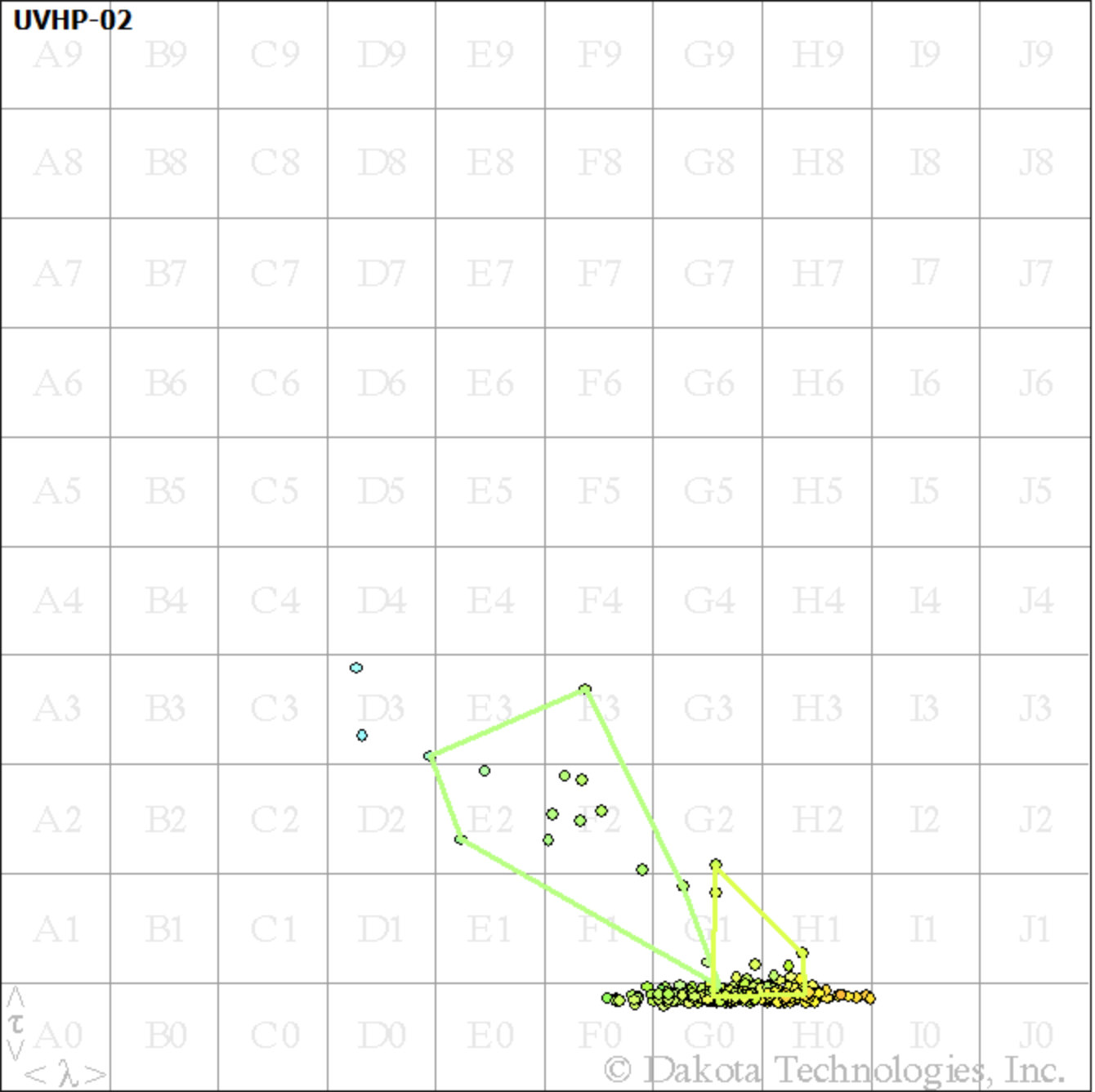
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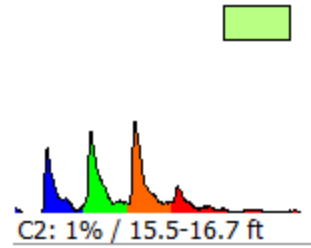

UVHP-01
A9 B9 C9 D9 E9 F9 G9 H9 I9 J9
A8 B8 C8 D8 E8 F8 G8 H8 I8 J8
A7 B7 C7 D7 E7 F7 G7 H7 I7 J7
A6 B6 C6 D6 E6 F6 G6 H6 I6 J6
A5 B5 C5 D5 E5 F5 G5 H5 I5 J5
A4 B4 C4 D4 E4 F4 G4 H4 I4 J4
A3 B3 C3 D3 E3 F3 G3 H3 I3 J3
A2 B2 C2 D2 E2 F2 G2 H2 I2 J2
A1 B1 C1 D1 E1 F1 G1 H1 I1 J1
A0 B0 C0 D0 E0 F0 G0 H0 I0 J0
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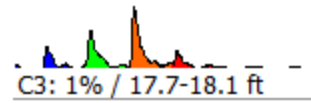

C2: 0% / 10.1-10.8 ft


C3: 1% / 16.6-17.5 ft

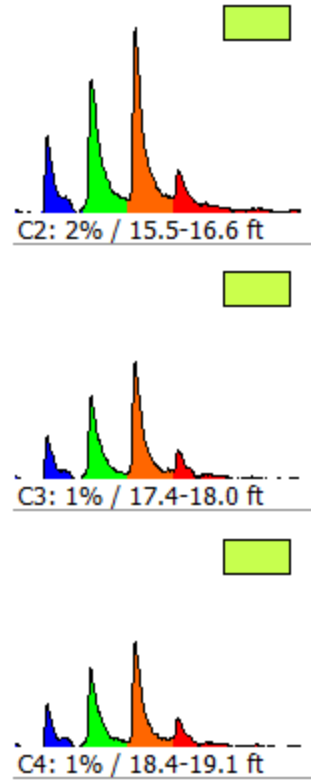

C4: 0% / 18.2-18.7 ft


UVHP-02
A9 B9 C9 D9 E9 F9 G9 H9 I9 J9
A8 B8 C8 D8 E8 F8 G8 H8 I8 J8
A7 B7 C7 D7 E7 F7 G7 H7 I7 J7
A6 B6 C6 D6 E6 F6 G6 H6 I6 J6
A5 B5 C5 D5 E5 F5 G5 H5 I5 J5
A4 B4 C4 D4 E4 F4 G4 H4 I4 J4
A3 B3 C3 D3 E3 F3 G3 H3 I3 J3
A2 B2 C2 D2 E2 F2 G2 H2 I2 J2
A1 B1 C1 D1 E1 F1 G1 H1 I1 J1
A0 B0 C0 D0 E0 F0 G0 H0 I0 J0
τ
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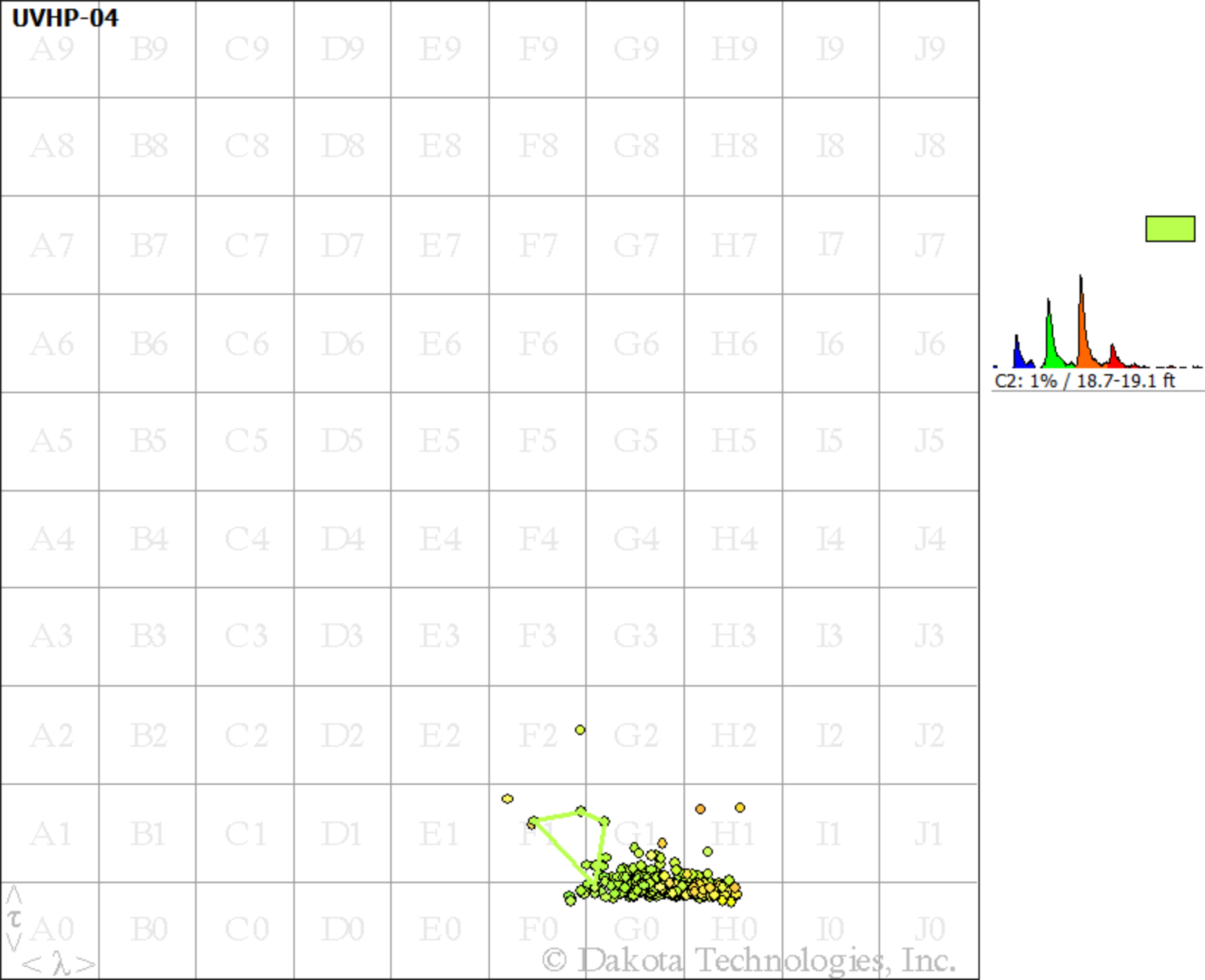

C2: 1% / 15.5-16.7 ft


C3: 1% / 17.7-18.1 ft

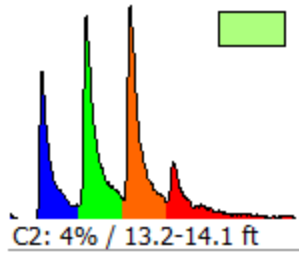
UVHP-03

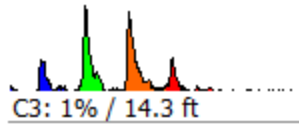


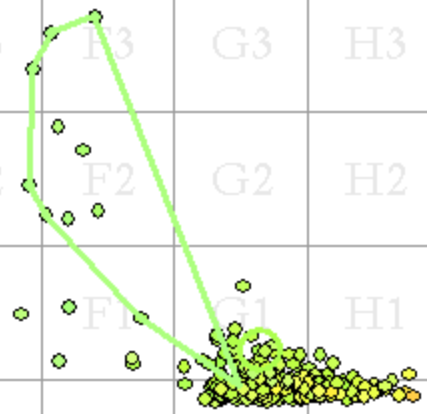
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UVHP-04
A9 B9 C9 D9 E9 F9 G9 H9 I9 J9
A8 B8 C8 D8 E8 F8 G8 H8 I8 J8
A7 B7 C7 D7 E7 F7 G7 H7 I7 J7
A6 B6 C6 D6 E6 F6 G6 H6 I6 J6
A5 B5 C5 D5 E5 F5 G5 H5 I5 J5
A4 B4 C4 D4 E4 F4 G4 H4 I4 J4
A3 B3 C3 D3 E3 F3 G3 H3 I3 J3
A2 B2 C2 D2 E2 F2 G2 H2 I2 J2
A1 B1 C1 D1 E1 F1 G1 H1 I1 J1
A0 B0 C0 D0 E0 F0 G0 H0 I0 J0
C2: 1% / 18.7-19.1 ft
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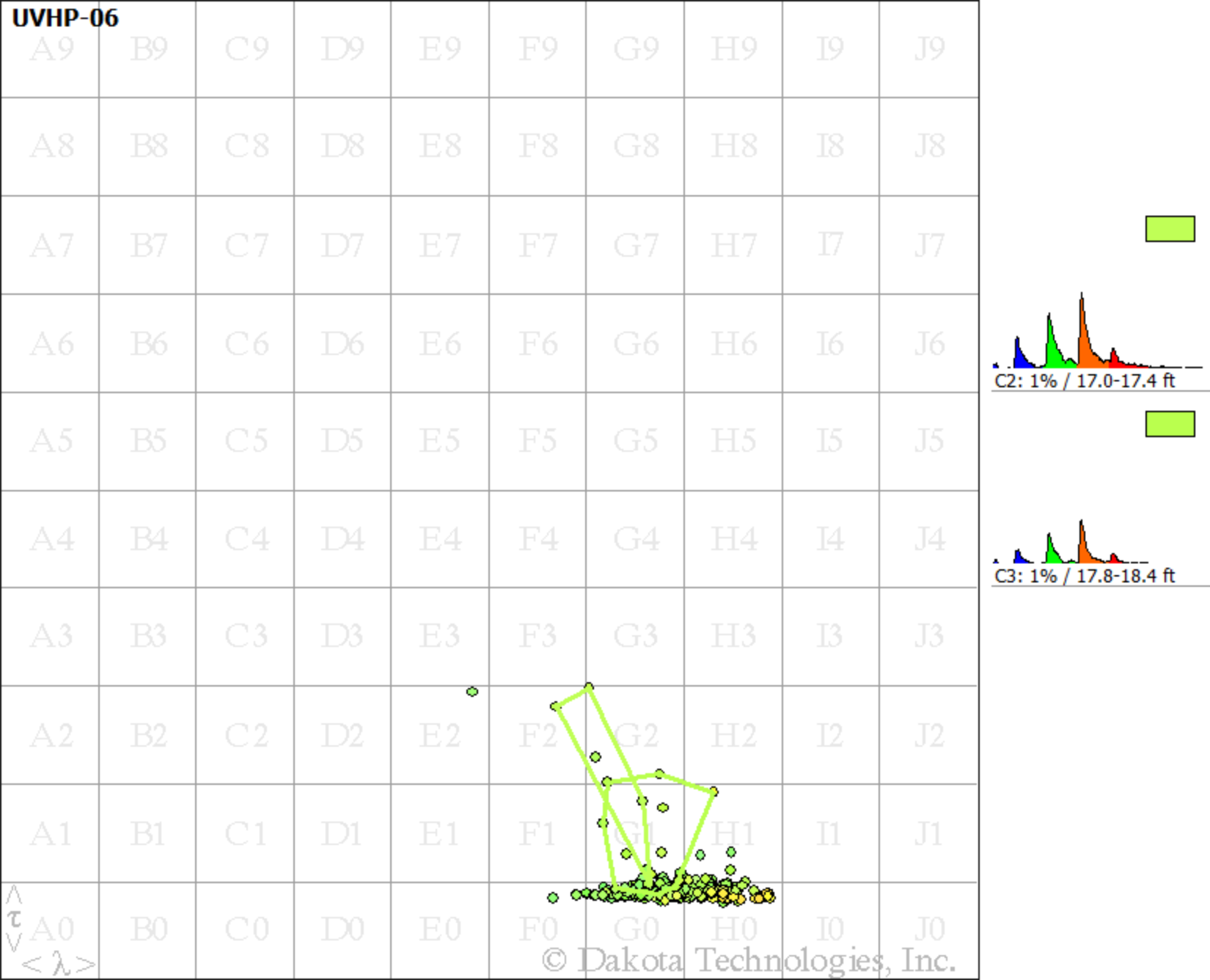
UVHP-05

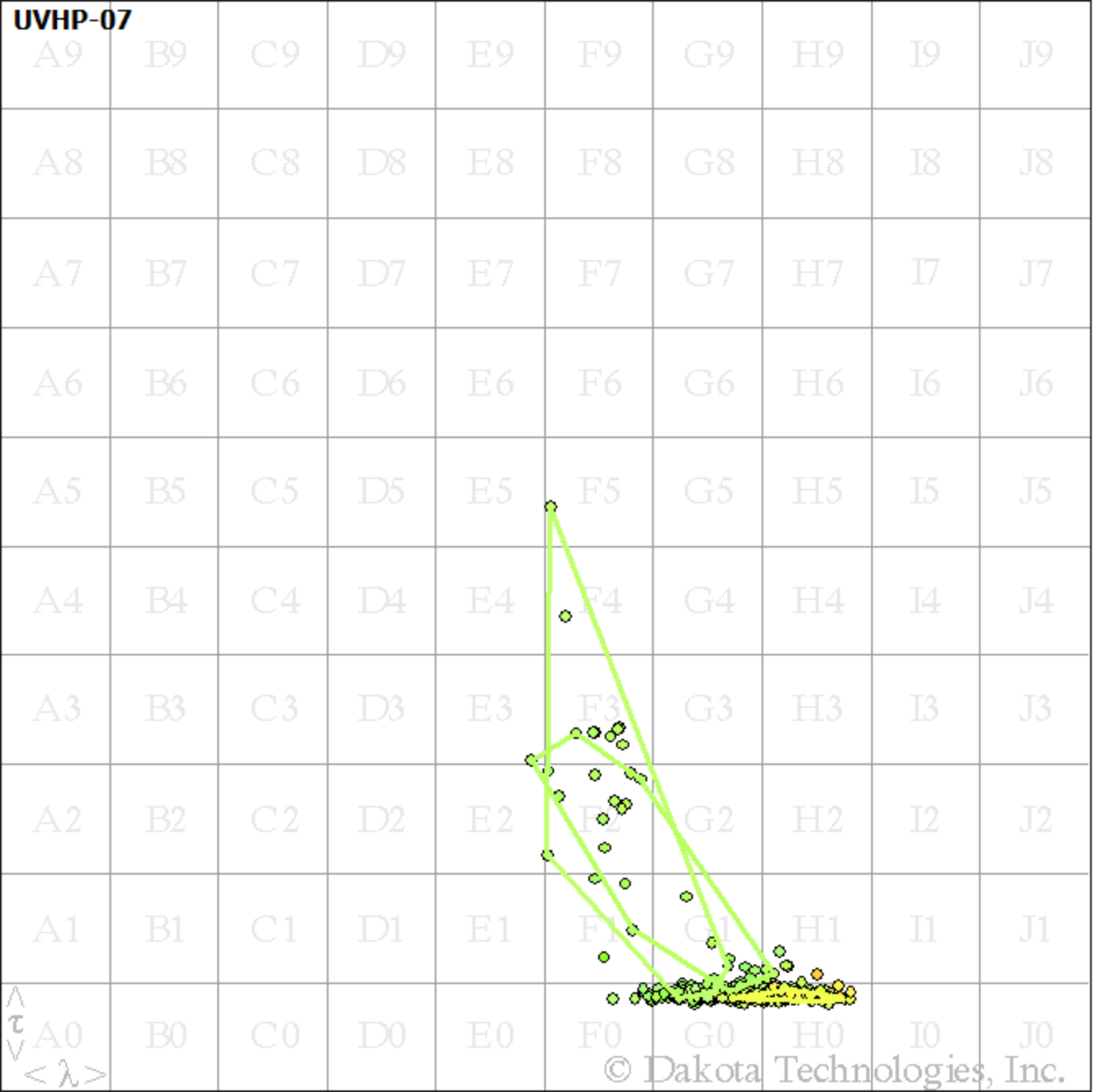


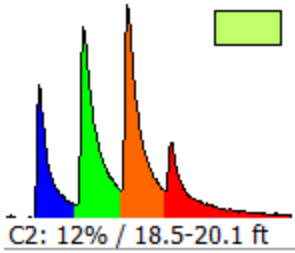


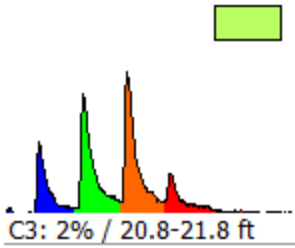


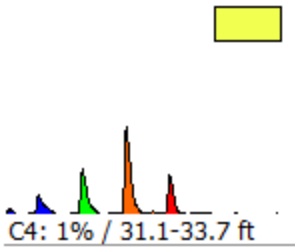
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UVHP-06
A9 B9 C9 D9 E9 F9 G9 H9 I9 J9
A8 B8 C8 D8 E8 F8 G8 H8 I8 J8
A7 B7 C7 D7 E7 F7 G7 H7 I7 J7
A6 B6 C6 D6 E6 F6 G6 H6 I6 J6
A5 B5 C5 D5 E5 F5 G5 H5 I5 J5
A4 B4 C4 D4 E4 F4 G4 H4 I4 J4
A3 B3 C3 D3 E3 F3 G3 H3 I3 J3
A2 B2 C2 D2 E2 F2 G2 H2 I2 J2
A1 B1 C1 D1 E1 F1 G1 H1 I1 J1
A0 B0 C0 D0 E0 F0 G0 H0 I0 J0
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C2: 1% / 17.0-17.4 ft
C3: 1% / 17.8-18.4 ft
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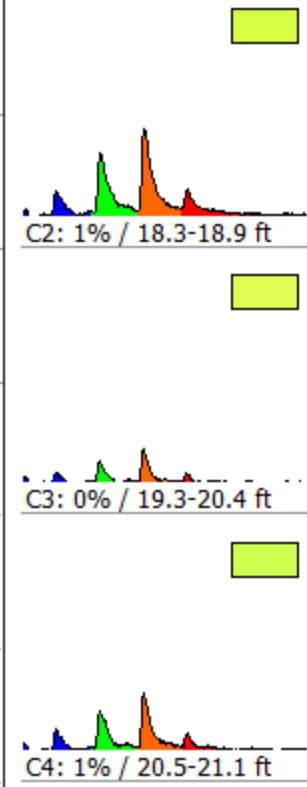

UVHP-07
A9 B9 C9 D9 E9 F9 G9 H9 I9 J9
A8 B8 C8 D8 E8 F8 G8 H8 I8 J8
A7 B7 C7 D7 E7 F7 G7 H7 I7 J7
A6 B6 C6 D6 E6 F6 G6 H6 I6 J6
A5 B5 C5 D5 E5 F5 G5 H5 I5 J5
A4 B4 C4 D4 E4 F4 G4 H4 I4 J4
A3 B3 C3 D3 E3 F3 G3 H3 I3 J3
A2 B2 C2 D2 E2 F2 G2 H2 I2 J2
A1 B1 C1 D1 E1 F1 G1 H1 I1 J1
A0 B0 C0 D0 E0 F0 G0 H0 I0 J0
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C2: 12% / 18.5-20.1 ft

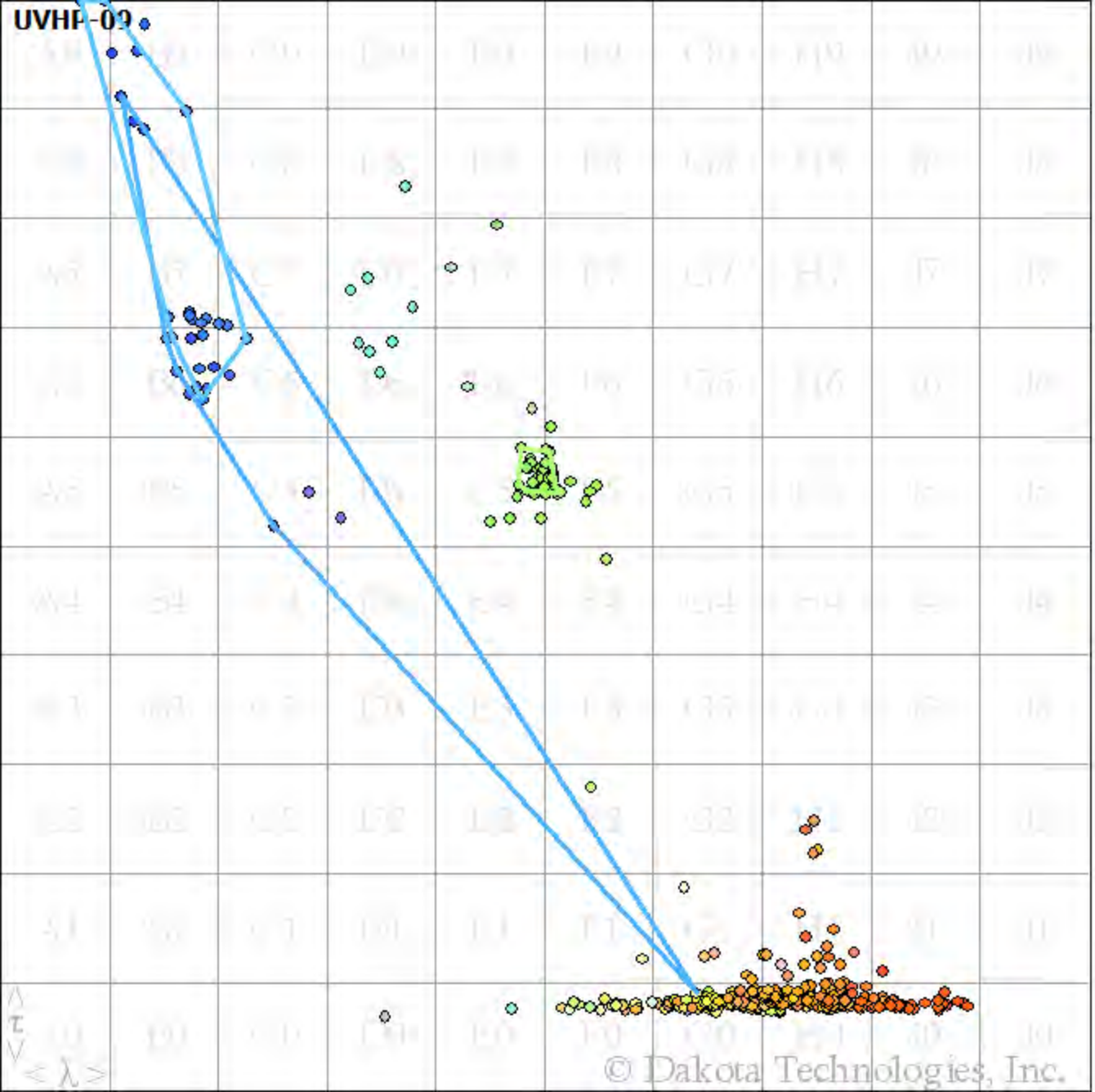

C3: 2% / 20.8-21.8 ft

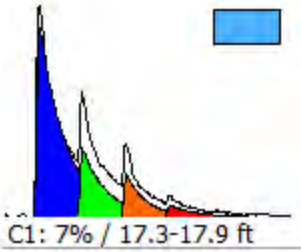

C4: 1% / 31.1-33.7 ft

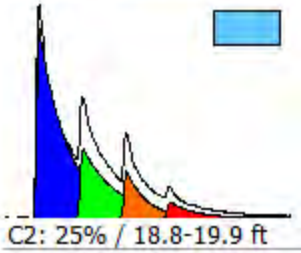
UVHP-08

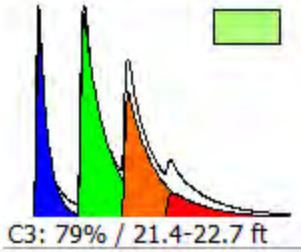


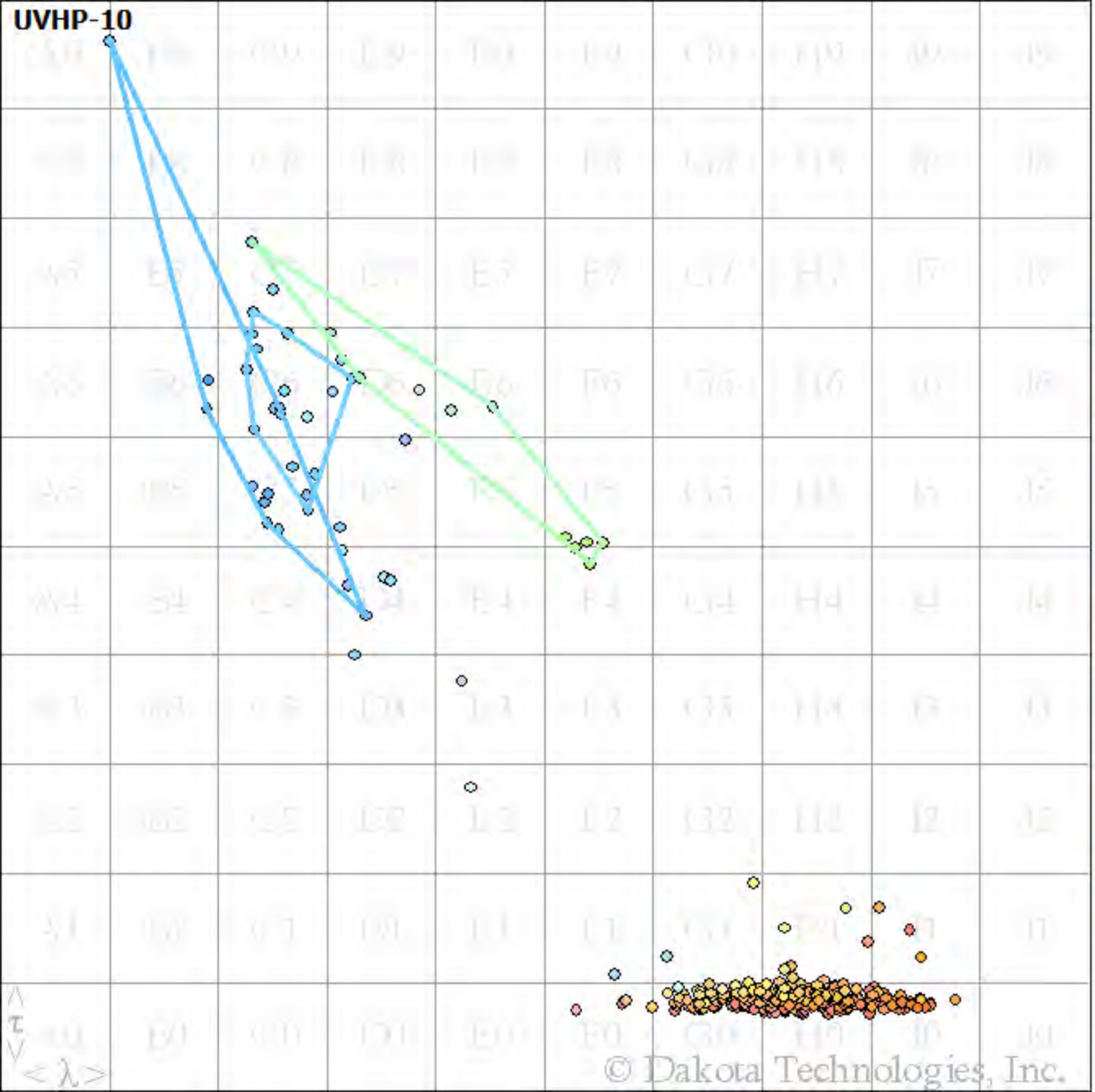
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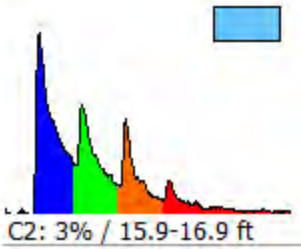

UVHF-02
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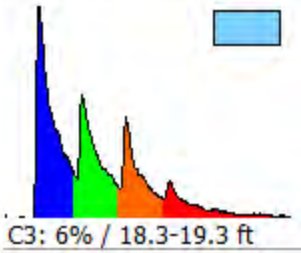

C1: 7% / 17.3-17.9 ft

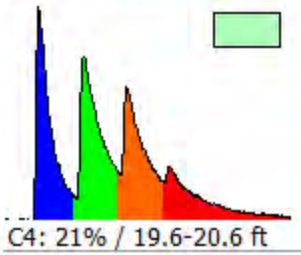

C2: 25% / 18.8-19.9 ft

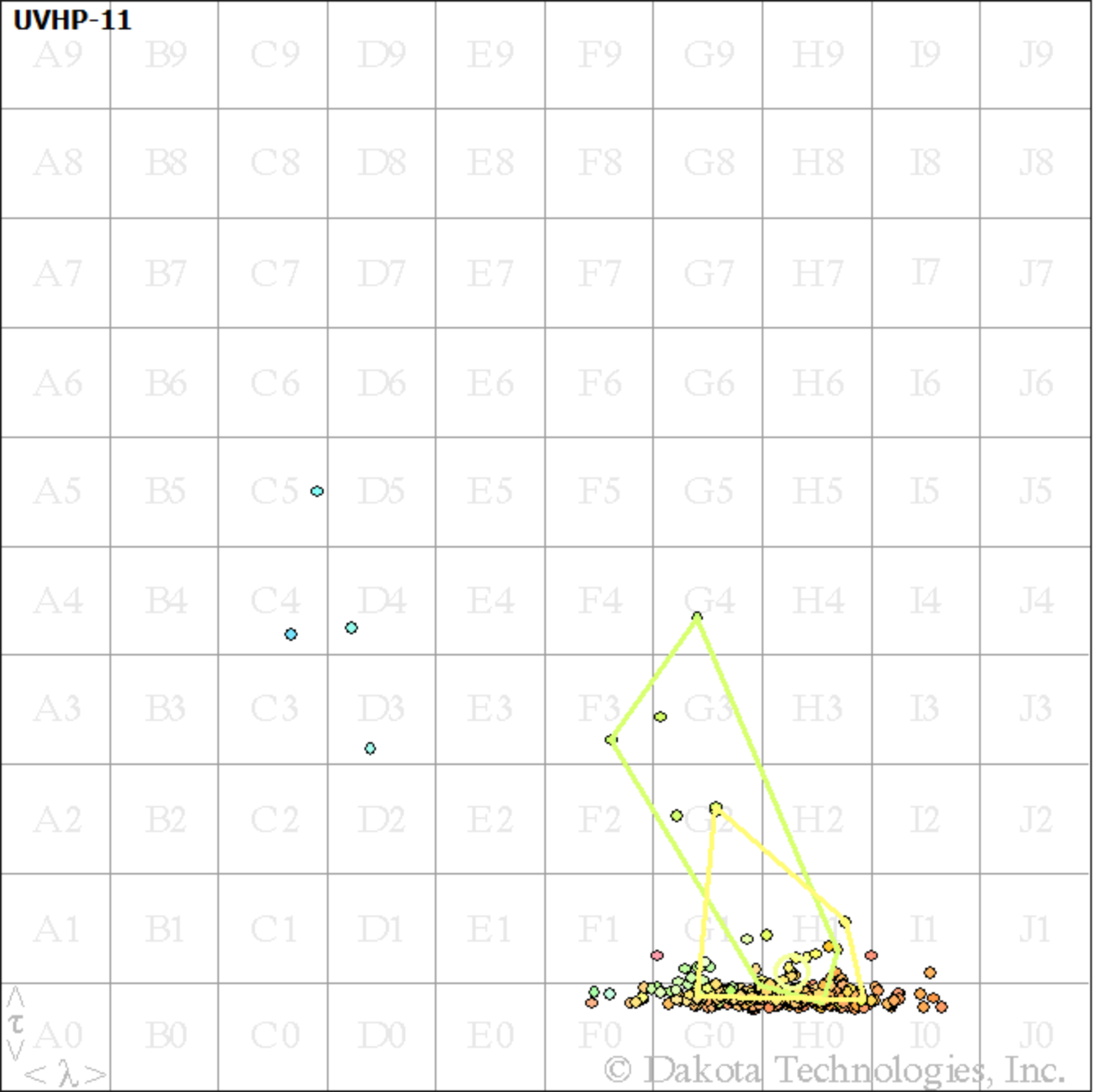

C3: 79% / 21.4-22.7 ft


UVHP-10
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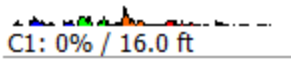

C2: 3% / 15.9-16.9 ft


C3: 6% / 18.3-19.3 ft


C4: 21% / 19.6-20.6 ft


UVHP-11
A9 B9 C9 D9 E9 F9 G9 H9 I9 J9
A8 B8 C8 D8 E8 F8 G8 H8 I8 J8
A7 B7 C7 D7 E7 F7 G7 H7 I7 J7
A6 B6 C6 D6 E6 F6 G6 H6 I6 J6
A5 B5 C5 D5 E5 F5 G5 H5 I5 J5
A4 B4 C4 D4 E4 F4 G4 H4 I4 J4
A3 B3 C3 D3 E3 F3 G3 H3 I3 J3
A2 B2 C2 D2 E2 F2 G2 H2 I2 J2
A1 B1 C1 D1 E1 F1 G1 H1 I1 J1
A0 B0 C0 D0 E0 F0 G0 H0 I0 J0
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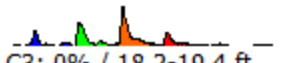


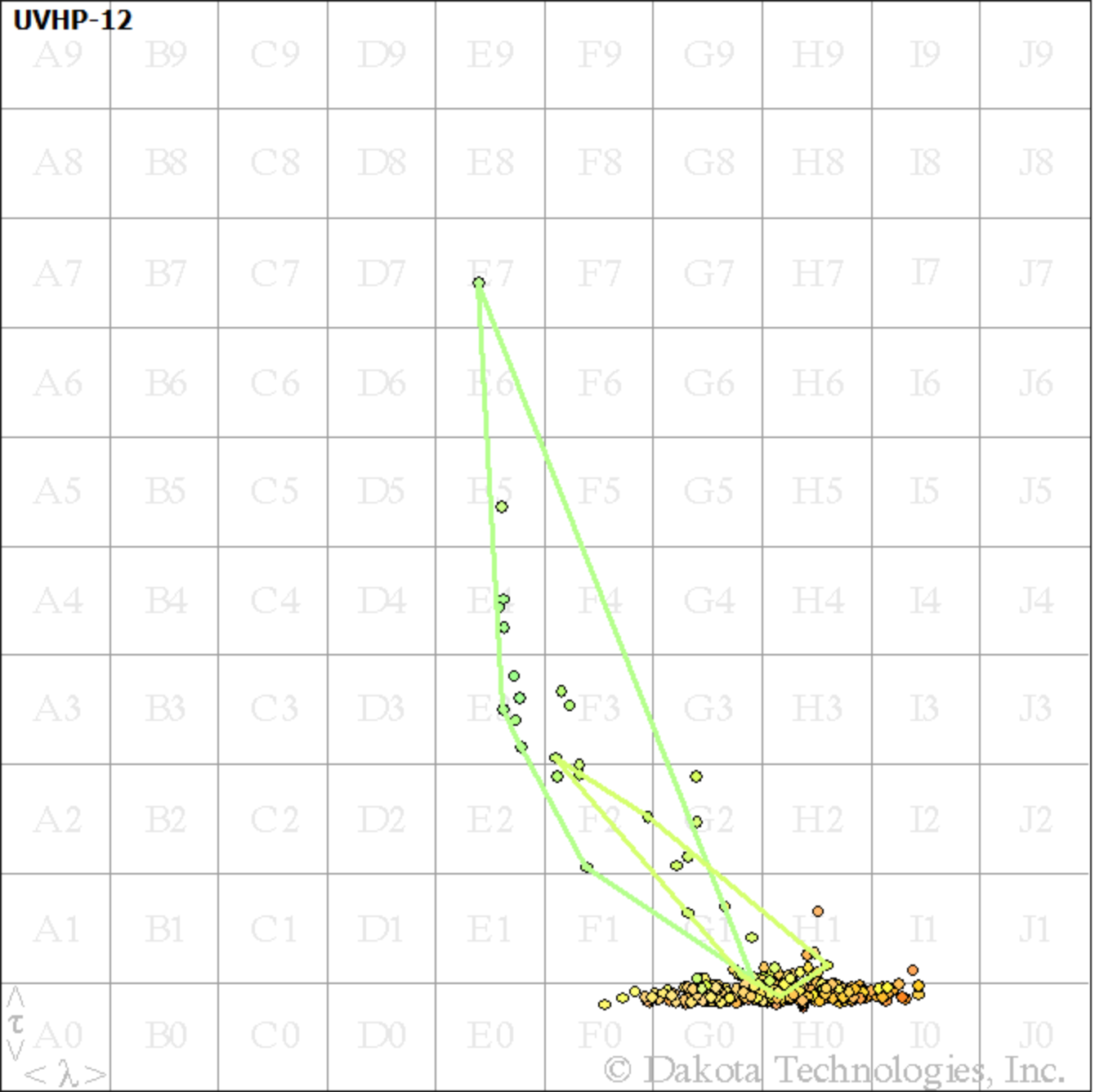

C1: 0% / 16.0 ft

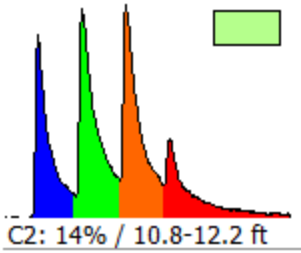


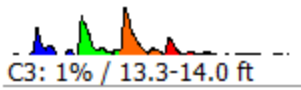

C2: 1% / 16.0-17.0 ft

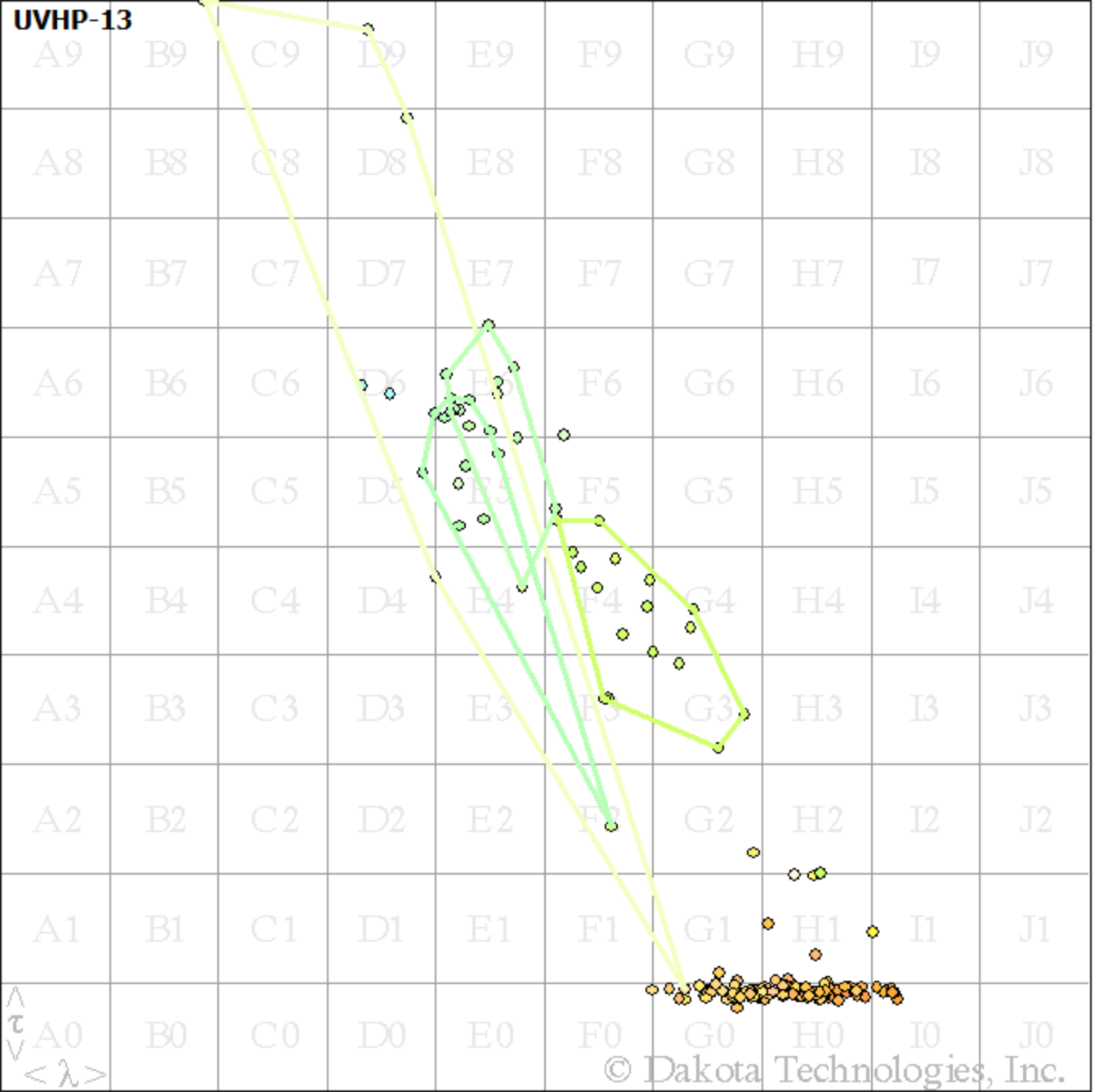


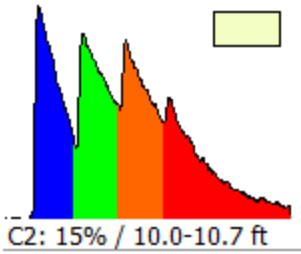

C3: 0% / 18.2-19.4 ft

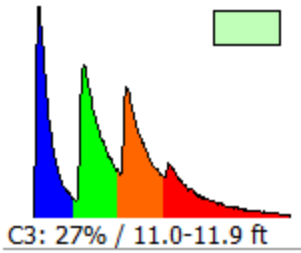

UVHP-12
A9 B9 C9 D9 E9 F9 G9 H9 I9 J9
A8 B8 C8 D8 E8 F8 G8 H8 I8 J8
A7 B7 C7 D7 E7 F7 G7 H7 I7 J7
A6 B6 C6 D6 E6 F6 G6 H6 I6 J6
A5 B5 C5 D5 E5 F5 G5 H5 I5 J5
A4 B4 C4 D4 E4 F4 G4 H4 I4 J4
A3 B3 C3 D3 E3 F3 G3 H3 I3 J3
A2 B2 C2 D2 E2 F2 G2 H2 I2 J2
A1 B1 C1 D1 E1 F1 G1 H1 I1 J1
A0 B0 C0 D0 E0 F0 G0 H0 I0 J0
τ
< λ >
© Dakota Technologies, Inc.

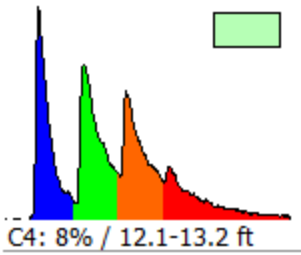

C2: 14% / 10.8-12.2 ft

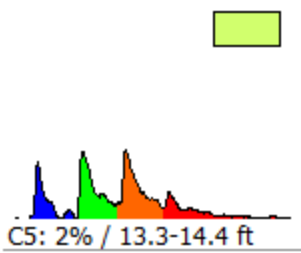

C3: 1% / 13.3-14.0 ft

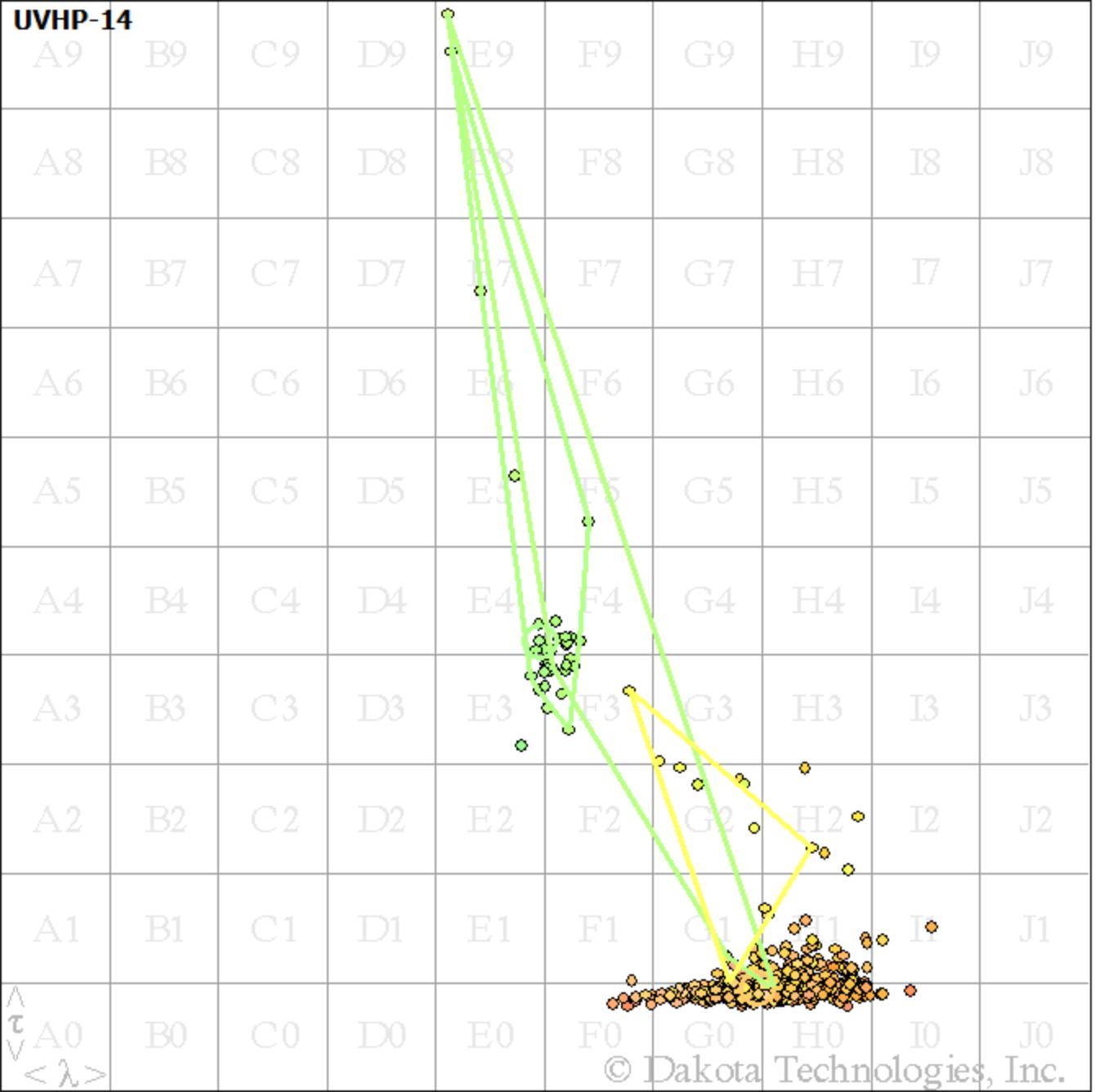

UVHP-13
A9 B9 C9 D9 E9 F9 G9 H9 I9 J9
A8 B8 C8 D8 E8 F8 G8 H8 I8 J8
A7 B7 C7 D7 E7 F7 G7 H7 I7 J7
A6 B6 C6 D6 E6 F6 G6 H6 I6 J6
A5 B5 C5 D5 E5 F5 G5 H5 I5 J5
A4 B4 C4 D4 E4 F4 G4 H4 I4 J4
A3 B3 C3 D3 E3 F3 G3 H3 I3 J3
A2 B2 C2 D2 E2 F2 G2 H2 I2 J2
A1 B1 C1 D1 E1 F1 G1 H1 I1 J1
A0 B0 C0 D0 E0 F0 G0 H0 I0 J0
τ
< λ >
© Dakota Technologies, Inc.

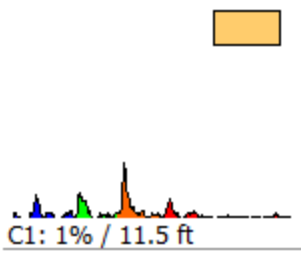

C2: 15% / 10.0-10.7 ft

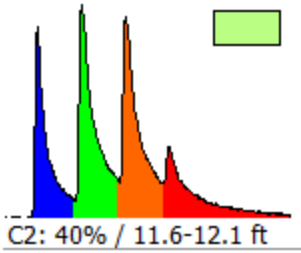

C3: 27% / 11.0-11.9 ft

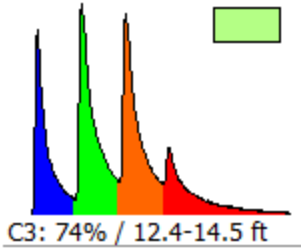

C4: 8% / 12.1-13.2 ft

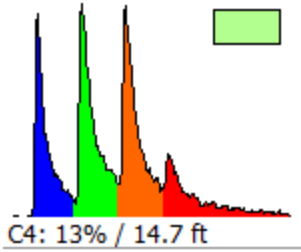

C5: 2% / 13.3-14.4 ft

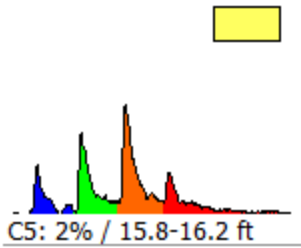

UVHP-14
A9 B9 C9 D9 E9 F9 G9 H9 I9 J9
A8 B8 C8 D8 E8 F8 G8 H8 I8 J8
A7 B7 C7 D7 E7 F7 G7 H7 I7 J7
A6 B6 C6 D6 E6 F6 G6 H6 I6 J6
A5 B5 C5 D5 E5 F5 G5 H5 I5 J5
A4 B4 C4 D4 E4 F4 G4 H4 I4 J4
A3 B3 C3 D3 E3 F3 G3 H3 I3 J3
A2 B2 C2 D2 E2 F2 G2 H2 I2 J2
A1 B1 C1 D1 E1 F1 G1 H1 I1 J1
A0 B0 C0 D0 E0 F0 G0 H0 I0 J0
τ
< λ >
© Dakota Technologies, Inc.

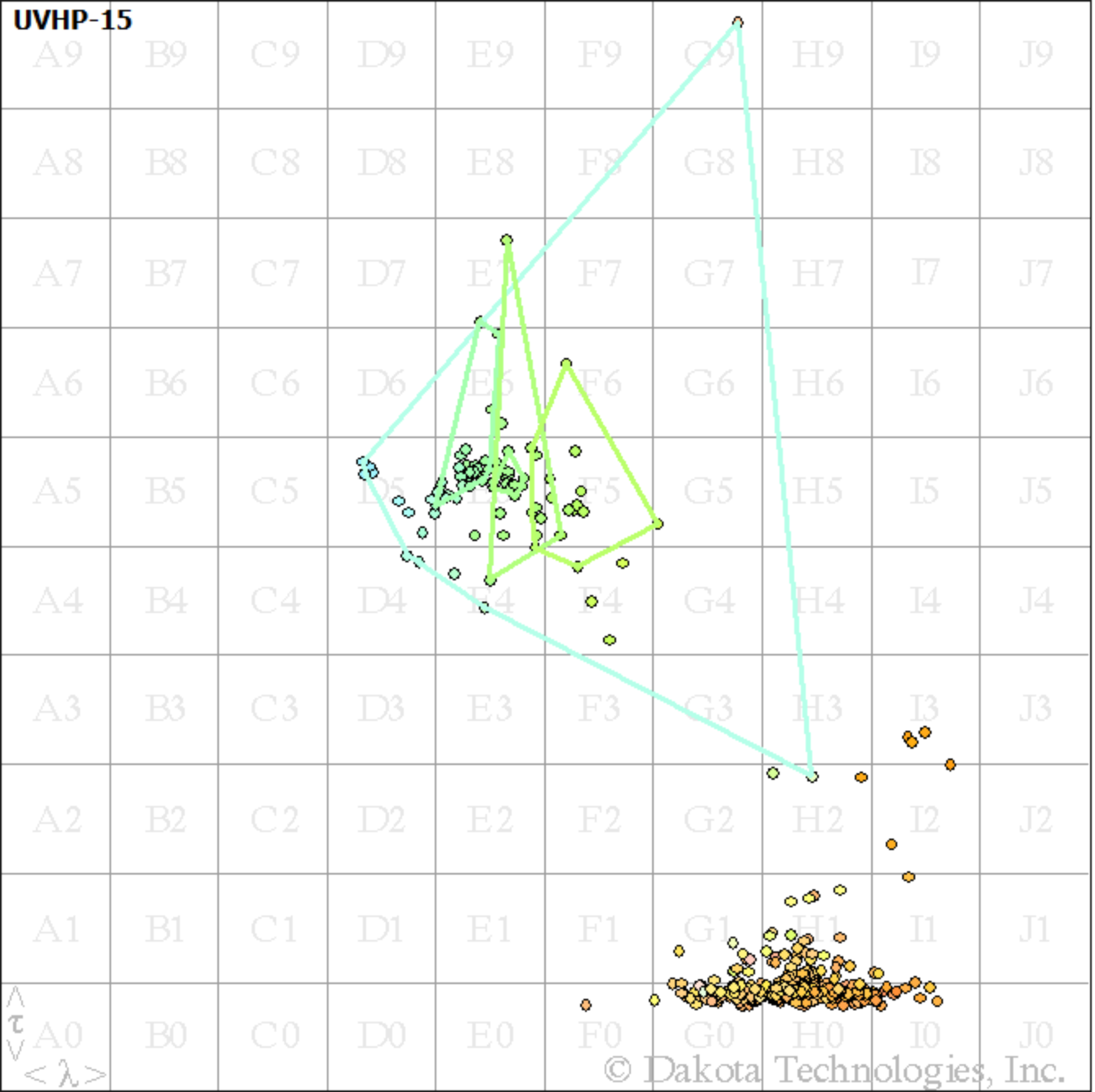

C1: 1% / 11.5 ft

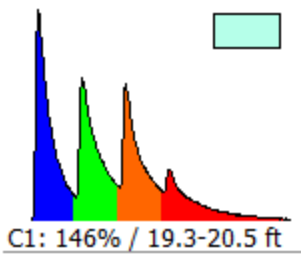

C2: 40% / 11.6-12.1 ft

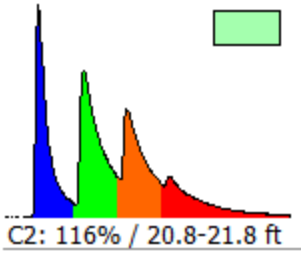

C3: 74% / 12.4-14.5 ft

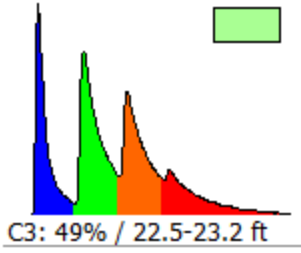

C4: 13% / 14.7 ft

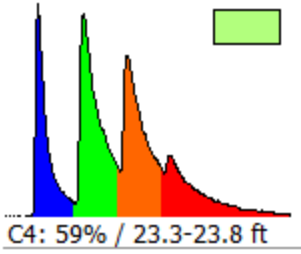

C5: 2% / 15.8-16.2 ft

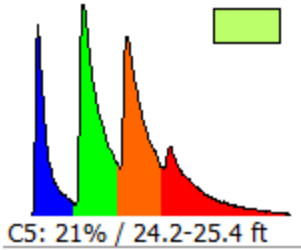

UVHP-15
A9 B9 C9 D9 E9 F9 G9 H9 I9 J9
A8 B8 C8 D8 E8 F8 G8 H8 I8 J8
A7 B7 C7 D7 E7 F7 G7 H7 I7 J7
A6 B6 C6 D6 E6 F6 G6 H6 I6 J6
A5 B5 C5 D5 E5 F5 G5 H5 I5 J5
A4 B4 C4 D4 E4 F4 G4 H4 I4 J4
A3 B3 C3 D3 E3 F3 G3 H3 I3 J3
A2 B2 C2 D2 E2 F2 G2 H2 I2 J2
A1 B1 C1 D1 E1 F1 G1 H1 I1 J1
A0 B0 C0 D0 E0 F0 G0 H0 I0 J0
τ
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C1: 146% / 19.3-20.5 ft


C2: 116% / 20.8-21.8 ft


C3: 49% / 22.5-23.2 ft


C4: 59% / 23.3-23.8 ft


C5: 21% / 24.2-25.4 ft

Appendix E

UVOST®-HP Reference Log

DAKOTA TECHNOLOGIES

Dakota Technologies
UVOST®-HP Reference Log

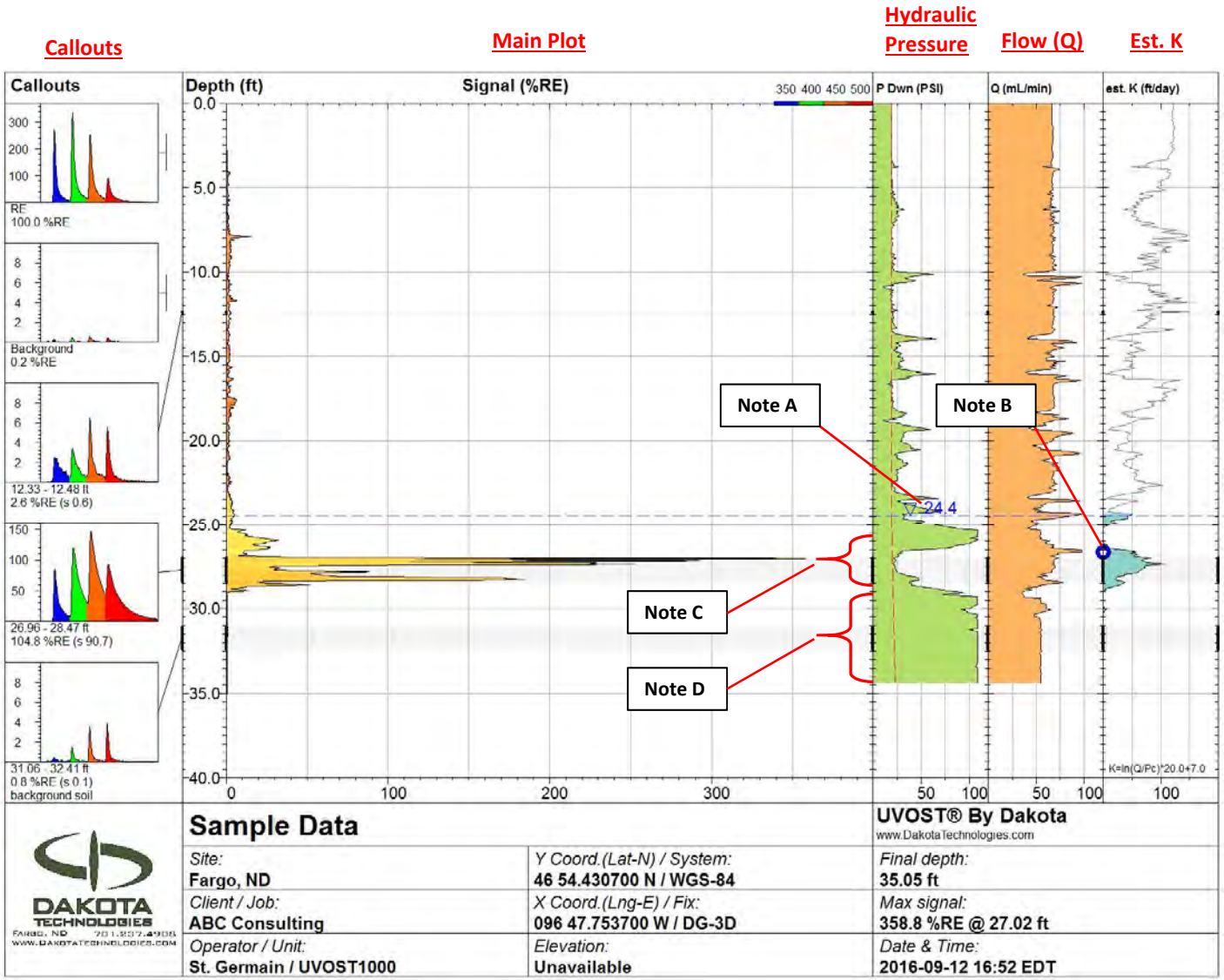
Callouts: Waveforms from selected depths or depth ranges showing the multi-wavelength waveform for that depth. The four peaks are due to fluorescence at four wavelengths and referred to as “channels”. Each channel is assigned a color. Various NAPLs will have a unique waveform “fingerprint” due to the relative amplitude of the four channels and/or broadening of one or more channels. Basic waveform statistics and any operator notes are given below the callout.

Main Plot: Signal (total fluorescence) versus depth where signal is relative to the Reference Emitter (RE). The total area of the waveform is divided by the total area of the Reference Emitter yielding the %RE. This %RE scales with the NAPL fluorescence. The fill color is based on the relative distribution of each channel’s area to the total waveform area (see callout waveform). The channel-to-color relationship and corresponding wavelengths are given in the upper right corner of the plot.

Hydraulic Pressure (P Dwn): Downhole hydraulic pressure is measured in response to pumping water into the formation at a constant rate. Measurements are logged simultaneously with UVOST data. The resulting log gives insight into the permeability of the soils.

Flow (Q): Water is pumped out of the port of the UVOST-HP probe at a constant rate of 60 mL/min. A change in flow (usually accompanied by an inverse pressure change) is an indicator of hydraulic properties of the soil.

Estimated K: The estimated hydraulic conductivity (K) is internally calculated by utilizing pressure and flow data in conjunction with dissipation test(s) performed at each location. The estimated K is calculated by the equation: K = ln(Q/P’)*20.0 + 7.0.



Note A: The water table has been calculated and plotted at 24.4’ bgs.

Note B: The circle on the Estimated K plot represents the location(s) of dissipation tests. Here, a single dissipation test was performed at 26.67 bgs’.

Note C: The highest LNAPL response in this log is present in an area of relatively higher permeability, as indicated by low pressure and higher estimated k values at approximately 26’ to 28’.

Note D: The increase in pressure starting near 29’ (transducer is maxed out, 100 psi) is due to low permeability conditions. In this example, the increase in pressure below the LNAPL represents a potential confining unit.

High Resolution Site Characterization Report

UVOST®-HP Investigation

PES Complex
3144 Passyunk Ave
Philadelphia, PA

DTC Project No: 0248.2022

July 12, 2022

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APPENDICES

Appendix A UVOST®-HP Field Summary

Appendix B UVOST®-HP Logs at 300% RE with Cluster Plots

Appendix C Reference Log

Appendix D Advanced Analysis

1.0 General Site Information

Dakota Technologies Company, LLC (DTC) was contracted by Stantec to perform a High-Resolution Site Characterization (HRSC) study at the PES Complex site, located at 3144 Passyunk Ave, Philadelphia, PA. This was a return visit to a site that was originally investigated in 2019. The goal of this visit was to investigate any changes within the LNAPL plume body since 2019, as various methods of remediation and LNAPL extraction have been in place since the original visit. Fieldwork included Laser Induced Fluorescence (LIF) to verify the presence of, and delineate the extent of, the LNAPL present in the subsurface. The LIF portion of the study employed the use of an Ultra-Violet Optical Screening Tool (UVOST®) combined with a hydraulic profiling (HP) sensor.

A description of the UVOST® technology, waveforms, cluster plots, limitations of LIF, and a UVOST® Reference Log are included in this report.

2.0 Laser-Induced Fluorescence - UVOST® Technology Overview

Fluorescence is a property of some compounds where absorbed excitation light stimulates the emission of light of a longer wavelength relative to the excitation source (laser). The stimulated release of light can be used to detect small amounts of polycyclic aromatic hydrocarbons (PAHs) in a larger matrix (soil, NAPL, water). This sensitive method of PAH detection has been used in laboratories for decades. With the commercial availability of lasers and optical fibers, this technology can also be applied in-situ in the field to identify the presence of non-aqueous phase liquids (LNAPL) that contain a wide variety of PAHs.

The UVOST® system sends ultraviolet (UV) laser light (308-nanometer wavelength) through a fiber optic cable strung through probe rods on a direct push drill rig. The light is reflected by a parabolic mirror within the probe and out a sapphire window on the side of the SPOC. As the probe is advanced, soil that is contiguous to the sapphire window is exposed to the pulsed UV laser light. If PAHs (compounds in petroleum, oils and lubricants that fluoresce) are present, these PAHs absorb a portion of the UV light and enter an electronically excited state. When returning to ground state, the PAHs release excess absorbed energy by emitting photons of longer wavelength light than the original UV excitation light.

This fluorescence is transmitted through a return fiber to the surface where the OST system transforms the fluorescence light into time-resolved multi-wavelength waveforms that capture the fluorescence intensity, wavelength, and lifetime (duration of the fluorescence).

The UVOST system is particularly sensitive to NAPL (compared to dissolved phase for instance); in other words, it focuses on the source term contaminant at the site. Vapor, dissolved, and absorbed hydrocarbon phases are usually invisible to the UVOST system, with dissolved phase PAHs in the vicinity of heavy NAPLs like coal tar being a notable (and confounding) exception. In most cases, only the NAPL-entrained PAHs respond to the UVOST system. These PAHs fluoresce most intently in saturated free product in the soil pore spaces and the response drops off with saturation, down to sheens of product lightly coating the soil particles. LIF essentially "ignores" any water in the pore spaces. Therefore, valid fluorescence data can be collected both above and below the water table.

2.1 Reference Emitter

The UVOST® system is checked for background signal (sources of fluorescence in the fiber, filter, mirror and sapphire window) and this signal is stored in the data file. A proprietary LNAPL mixture known as the Reference Emitter (RE) is used for quality assurance and quality control for the qualitative and semi-quantitative response of the UVOST. DTC has used this same RE for decades. During the pre-log calibration, a cuvette containing the RE fluid is placed over the sapphire window; the laser is adjusted to achieve optimal signal amplitude, and the response from the RE is then recorded. The RE's fluorescence intensity (brightness) is then used as a definition of fluorescence intensity of 100% relative to the RE, or 100% RE. Typically, the RE's raw total fluorescence will fall between 10,000 and 12,000 picovolt-seconds (pVs). The system background fluorescence can vary from 0.1% to 1%RE, or 0 to 100-pVs raw total fluorescence. The operator ensures the RE response has the correct shape and intensity so that the UVOST® system is "calibrated" for each log and minimizes system background by keeping the mirror and window clean and the SPOC purged of moisture. All the fluorescence responses obtained in the subsequent borehole are gauged against the RE's fluorescence response.

The relationship between the instrument responses from NAPL in the subsurface and the %RE depends on the NAPL type, age, and other factors. There are NAPLs that fluoresce much more brightly than the RE (>100%RE) at full pore saturation, such as gasolines, diesels, and crude. Other NAPLs might only fluoresce half as intensely as RE, such as heavy crudes which might fluoresce at 50%RE. One must be careful to "temper" their interpretations of fluorescence based on the fuel type, degree of weathering and other site-specific factors. Please ask for assistance with this and we'll be glad to help you do site-specific calibration of your data set!

The combined fluorescence of non-NAPL impacted natural soils and system background (the optic surfaces) generally fall in the range 0.25-0.75 %RE. A signal response greater than 1.0%RE *typically* indicates the presence of LNAPL, however, various natural materials including calcareous and carbonaceous soils may produce "false positive" results with signal responses as high as 10% to 20%RE. Lifetimes above the average baseline soils are often KEY indicators of NAPL. Buried wood and organics can be even more fluorescent than background soils but again, the lifetime information can assist in helping you "make the call" on whether it's NAPL vs. natural fluorescence. Therefore, it is crucial that consumers of fluorescence data rigorously inspect the fluorescence responses (waveforms, fill colors, lifetimes, etc.) to distinguish the presence of NAPL from false positives from natural soils and organic materials. With a little practice and knowledge, it's generally easy to sort out the false positive fluorescence from the actual NAPL, which is key to prevent over-estimation of NAPL impact.

2.2 Waveforms

Waveforms are fluorescence "signatures" that are used to differentiate LNAPL types such as kerosene versus intact gasoline, weathered gasoline versus diesel fuel, etc. **Waveforms also provide the capability to effectively differentiate false positives from intact LNAPLs**. Various waveform patterns for pure PAHs, fuels/oils, weathered gasoline, and false positive substances can be viewed at Dakota's website: http://www.dakotatechnologies.com/learn-more/intro-to-lif/data-interpretation.

Figure 1 shows three sample waveforms used to characterize NAPL.

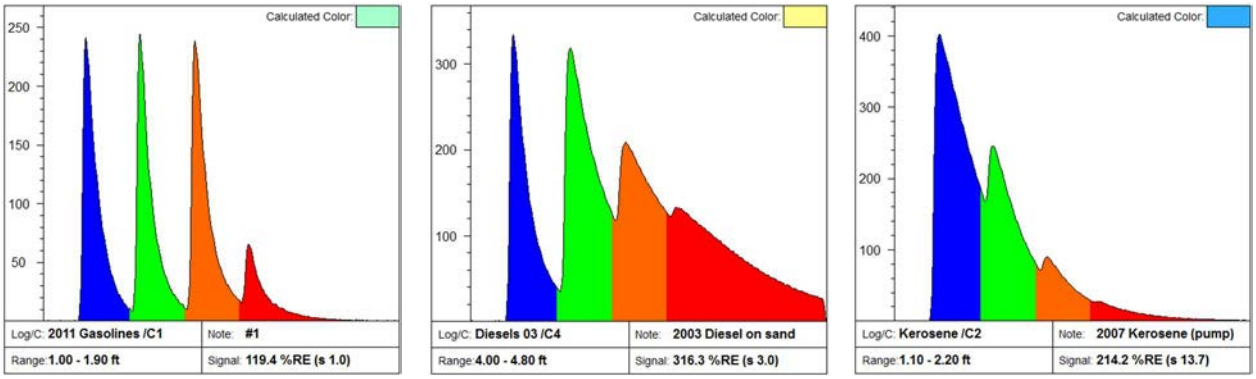


Figure 1: Waveforms generated by gasoline, diesel and kerosene. The four colored peaks in the waveforms (referred to as channels) represent different PAH emission wavelengths (colors) that are filtered by the UVOST system into four categories: 350-nanometers (blue), 400-nanometers (green), 450-nanometers (orange), and 500-nanometers (red). In the waveform callouts (graphs from selected parts of a log) shown, the y-axis represents the intensity of the fluorescence signal (V) and the x-axis is time (approximately 350-nanoseconds).

The relative contribution of each channel's area to the total waveform area defines the Signal (%RE) fill color on the main UVOST log. For example, a waveform with a stronger contribution by the blue channel relative to the other three channels will plot with a bluish color on the UVOST log (see the kerosene waveform, and the resulting blue fill color in the upper right, in Figure 1). In the case of the gasoline waveform, the calculated color is a pale green that is displayed in a box in the upper right-hand corner of the waveform plot window. The shorter wavelength channels on the left (blue/green) represent smaller PAHs with two to three benzene rings; the middle two channels (green/orange) contain response from intermediate size PAHs with three to four benzene rings; the rightmost channels (orange/red) correspond to larger PAHs with four or more benzene rings. Note, the blue, green, orange, and red colors associated with the four channel wavelengths are **not** the actual color of fluorescence, they are placeholder colors. The true colors of the UVOST waveform's four channels are ultraviolet, violet, indigo, and blue/cyan from left to right. The ultraviolet fluorescence in the first channel (invisible to the human eye or visible-light spectrum cameras such as the OIP (Optical Image Profiler)) is particularly useful for identifying "intact" gasolines at petroleum service stations.

The waveform's four channels are sequentially delayed pulses of fluorescence arriving as a "train" on the detector. The amplitude of each channel corresponds to the intensity of each fluorescence color

being released by the PAHs following the excitation by the UVOST laser pulse. The pulse of each color starts out strongest immediately following the excitation laser pulse. But after the laser pulse is gone, the fluorescence quickly begins to decay, eventually returning to darkness (no more light being emitted). The time it takes for the laser excitation energy to dissipate (and the subsequent PAH fluorescence to fade away to darkness) is recorded on the times axis and leads to a "ski slope" on the right side of each channel or "peak". The point in time at which each channel's fluorescence has decayed to approximately 1/e of the maximum is classically referred to as that channel's "lifetime". In general, longer lifetimes (wide peaks) are indicative of intact "juicy" LNAPL with lots of intact solvent molecules such as aliphatics. False positive soils or highly weathered NAPLs with little very solvent left usually have shorter lifetimes (skinny peaks). Heavy NAPLs like coal tar are a notable exception, as they experience intramolecular energy transfer after excitation (due to their excessive PAH content), resulting in extremely low fluorescence (only a few %RE even when fully saturating the soil), extremely short lifetimes (narrow peaks) and domination by the orange and/or red channels. Atmospheric concentrations of molecular oxygen that are present under "bench-top" NAPL testing conditions artificially lower fluorescence lifetimes compared to in-situ conditions where oxygen is lacking due to bioremediation processes. You can always expect to see longer lifetimes (and larger overall %RE) from in-situ readings compared to NAPLs take from wells and tested under atmospheric oxygen (~20%) conditions.

2.3 Cluster Plots

The hundreds, or thousands, of waveforms in each UVOST log are immensely useful, but with only five callouts in each log, it's hard to take it all in and make sense of all of them. Cluster plots provide a method for viewing all the waveforms by converting them into simple color and lifetime data and plotting each waveform as a bubble on a Cartesian coordinate system. The cluster plot axis corresponds to fluorescence wavelength (λ) (or color) on the X-axis and the fluorescence lifetime (τ) on the Y-axis as measured and weighted in each the four channels. In this fashion, all data points from a UVOST log are sorted by their color and lifetime properties and can be viewed in a single figure, allowing intuitive comparisons to be made among potential fluorescence categories. Figure 2 demonstrates the relationship between data points in the log and how they appear in the cluster plot.

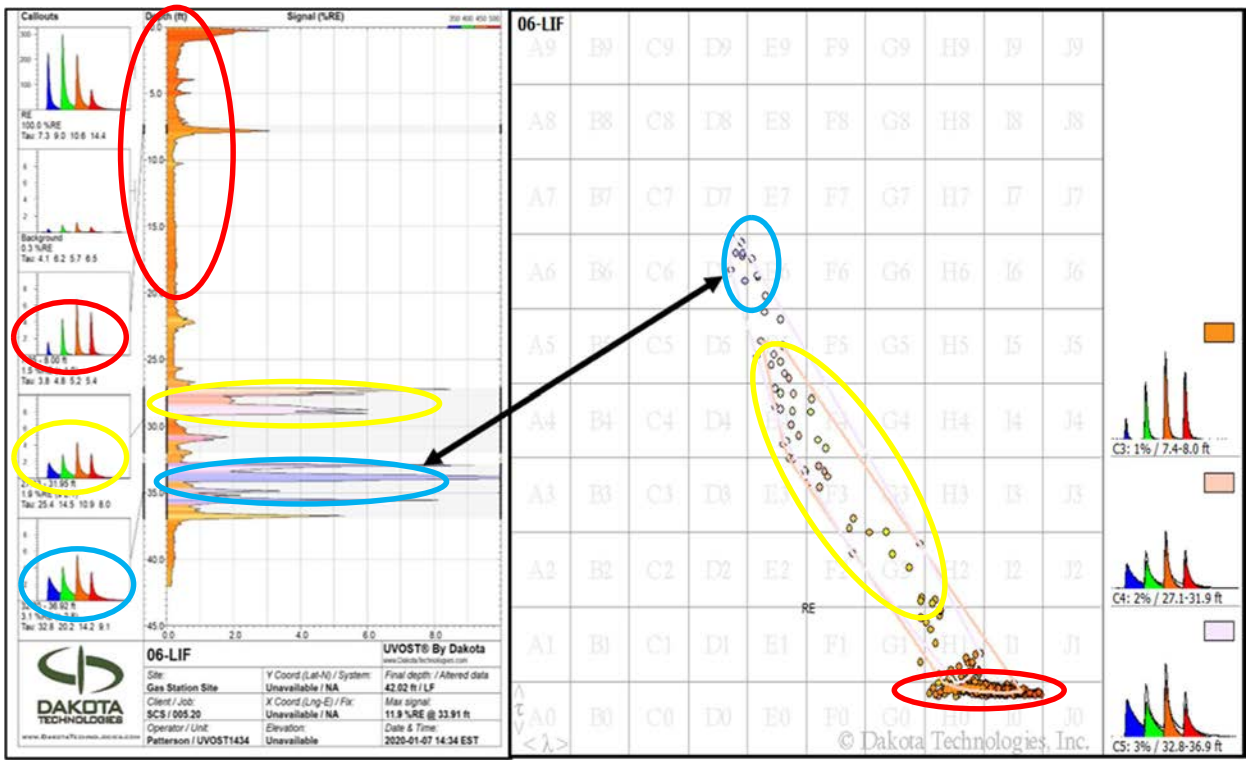


Figure 2: The X-axis of the Cluster Plot (right) corresponds to the balance of the four colored channels in the waveform; the Y-axis relates to fluorescence decay or "lifetimes" of the four-waveform channels.

Responses dominated in the blue/green channels (intact gasolines for instance) will plot in the left side of the cluster plot (see blue ovals in Figure 2). Likewise, if the orange and red channels make up bulk of the fluorescence response (background soils), the data point will plot on the right side of the cluster (see orange ovals in Figure 2). Waveforms with a relatively equivalent contribution from all four channels, or with the two central peaks dominating such as modestly weathered NAPLs or light staining of intact NAPLs, will plot somewhere in the middle (yellow ovals in Figure 2). Similarly, longer-lived responses from intact fuels (wide at the base of the waveform) will plot higher on the Y-axis and waveforms with shorter lifetimes (narrow at the base of the waveform) such as carbonaceous soils or heavily weathered NAPL, plot lower on the Y-axis. In a simple sense, if waveforms leave the "home cluster" of soils and highly weathered NAPL at lower right, they are highly suspect of indicating NAPL.

To further aid in determining the source on the UVOST® log for a point cluster, the main callouts from the log with their respective depth intervals are depicted on the upper left corner of the cluster plot (not

depicted here). Polygons (for depth ranges) and circled data points (for discrete depths) with the same coloration as the callout waveform enclose the point clusters included in that callout.

Weathering and formulation of each LNAPL will influence where the LNAPL appears on the cluster plot. In other words, it is **not** possible to identify a fuel solely by its location on a cluster plot. In Figure 3, the formulation of the 2 different diesel signatures labeled 1995 and 2007, fall into different regions of the plot. This is due to the difference in lifetime and wavelength characteristics of the four channels that make up these slightly different diesel waveforms due to source, age, and oxygen levels when this data was recorded.

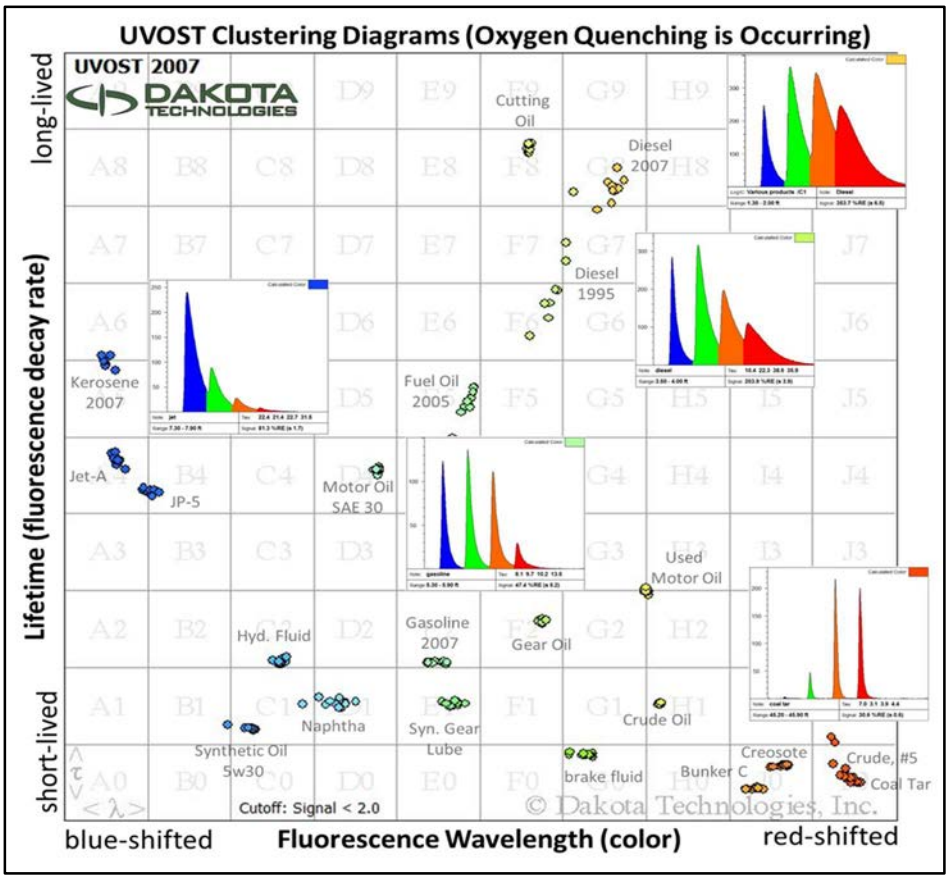


Figure 3: Reference examples of LNAPL types that were placed on the window of a UVOST® system in a laboratory setting. The cluster plot positions displayed illustrates the cluster separation of LNAPL types achievable with the UVOST and is not indicative of exclusive plotting location—LNAPL may plot across multiple grid cells as the plume weathers or interacts with the native soil.

3.0 Hydraulic Profiling (HP) Description

The Hydraulic Profiling add-on is a logging tool that measures the pressure required to inject a flow of water into the soil as the probe is advanced into the subsurface. The injection pressure log is an excellent indicator of formation permeability. In addition to injection pressure, hydrostatic pressure can be measured under a zero flow condition, called a dissipation test. This allows a calculation of potentiometric surface (water table) upon successful completion of the dissipation test.

Prior to starting a log, there is a quality assurance (QA) check on the down-hole transducer to ensure proper function. The probe is submerged in a reference tube and filled with water. A reading is taken at the hydraulic port when it is submerged to a depth of 1 foot and a second reading at 0 feet, or baseline, under zero flow conditions. The reading at 0 feet, or the baseline pressure, is equal to the measurement of atmospheric pressure. Subtracting reading 2 from reading 1 should produce a result of 0.433 psi (+/- 10%), which is the hydrostatic weight of a 1-foot column of water.

The UVOST®-HP probe is advanced into the ground at a rate of approximately 2 cm/sec. The pump in the HP flow module draws water from the supply tank and pumps water down the trunk line at a constant flow rate (60 mL/min). The downhole transducer monitors the pressure generated by injecting water into the formation matrix. The log provides graphs of the pressure and flow rate versus depth alongside the fluorescence plot. If a dissipation test is performed below the water table and the test successfully stabilizes, the result can be corrected to an absolute hydrostatic value, from which a potentiometric surface (water table) can be calculated. Using the calculated water table to correct for hydrostatic pressure increase, a hydraulic conductivity (K) value for a given depth below the water table can be estimated using the following equation:

$$K = \ln(Q/P') * 20.0 + 7.0$$

where P'= downhole pressure – (0.433 * depth below water table) – atmospheric pressure, and Q is equal to flow. K values above the water table are also reported after a successful dissipation test even though they are suspect due to varying permeability behavior of dry soils. These values still maintain

some qualitative value to the eye, and may lend insight into preferential pathways in the vadose zone. HP data can be incorporated into a 4DIM visualization protocol.

4.0 Site-Specific Results and Discussion

This round of UVOST investigation took place from July 12th to July 14th, 2022. The target depth for the UVOST®-HP locations was approximately 25-ft below ground surface (bgs). All of the borings were able to be advanced to adequate depth, though several borings (4,7,8,15) only reached the necessary depth upon subsequent re-attempts. In these cases, a solid point was advanced through the very hard layer of material that was holding up advancement. This layer was found at approximately 17-18ft in depth.

Every boring that was completed to depth contained responses that indicate the presence of LNAPL, except boring UVHP-17. Borings UVHP-01 to UVHP-15 were completed in the same locations as the 2019 UVOST investigations, so these were expected to have LNAPL responses. The remaining borings were completed at locations that additional work such as MIP, OIP, and sampling were done, so the presence of LNAPL was not surprising. The fiber used during the advancement of boring UVHP-17 was found to be cracked/broken after the boring was completed. A different fiber was used to complete the boring UVHP-016. There is no useful data from 20.4 feet to bottom of boring for UVHP-17.

4.1 Site-specific Waveforms

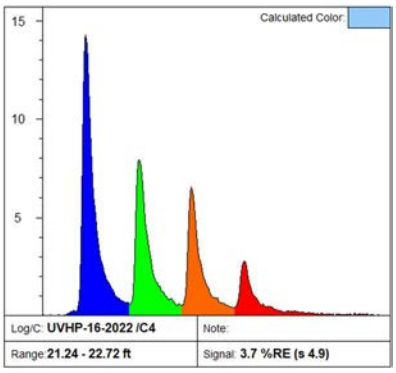
In discussions with client, and based on other lines of evidence, it was determined that three main types of fluorescence were observed.

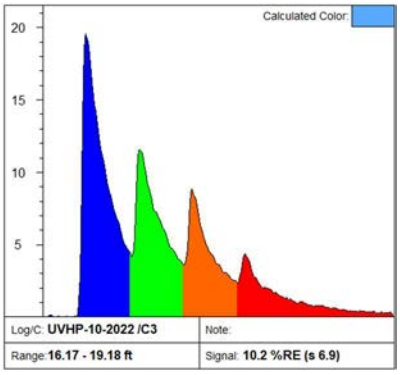
In order to better visualize the survey results, a non-negative least squares (NNLS) process was applied to the raw fluorescence data in order to sort the fluorescence into main classes thought to represent the differing NAPLs at the sight. Note that there was no evidence of significant non-NAPL fluorescence, or “false positives” being encountered at the site.

Type 1

The Light Naphtha Range (LNR) fluorescence was blue-shifted, and for reasons that aren't clear, consisted of both long- and short-lived lifetime versions. Oxygen quenching may play a role here due to ongoing remediation processes.

These two types were named LNR-SL and LNR-LL harvested from logs UVHP-16 (21.24 - 22.72 ft) and UVHP-10 (16.7 – 19.18 ft).



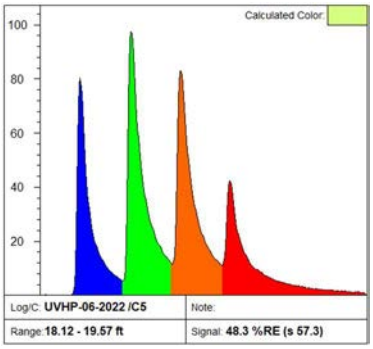


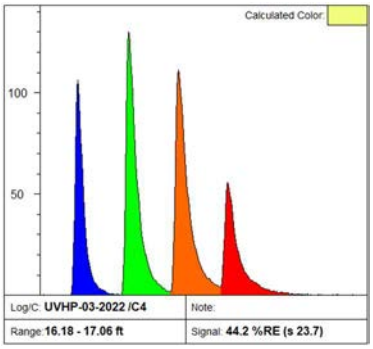
Figures 1 and 2: Show waveforms taken from UVHP-16 (LNR-LL) and UVHP-10 (LNR-SL) used during NNLS analysis.

Type 2

The Reformate (REF) was less blue-shifted, and for reasons that again aren't clear, consisted of both long- and short-lived lifetime versions. Oxygen quenching may play a role here due to ongoing remediation processes.

These two types were named REF-LL and REF-SL harvested from logs UVHP-06 (18.12 – 19.57 ft) and UVHP-03 (16.16 – 17.06 ft) respectively.





Figures 3 and 4: Show waveforms taken from UVHP-06 (REF-LL) and UVHP-03 (REF-SL) used during NNLS analysis.

Type 3

The third fluorescence type was thought to be related to weathering (fermentation) and was called FERM. FERM was harvested from UVHP-22 (9.47 – 10.08 ft) and exhibits the classic red-shift one observes in highly weathered NAPLs.

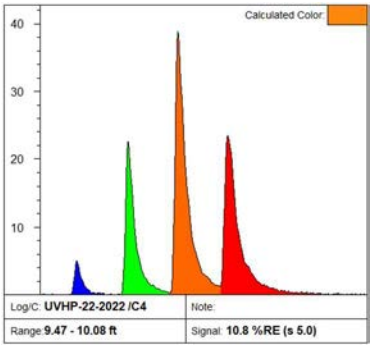


Figure 5: Shows waveform taken from UVHP-22 (FERM) used during NNLS analysis.

These five waveforms were used to conduct a non-negative least squares fitting analysis of the data. The long-lived and short-lived versions of LNR and REF were summed together to create three main classes of LNR, REF, and FERM fluorescence.

The above waveforms (or combination thereof) were the most common waveforms encountered at the site. It is important to note that even small fluorescence responses can indicate NAPL. Slight changes in waveform colors and wavelength lifetimes are the key indicators of NAPL versus background fluorescence. When reviewing UVOST waveforms to determine NAPL type, it is important to consider additional lines of evidence such as cluster plots, confirmation soil sampling and lab analysis. Consistent waveforms at a site typically indicate consistent product and saturation.

4.2 Site Cluster Plots

Cluster Plots (bubble diagrams) are displayed on each individual log in Appendix B. Each "bubble" represents one of the waveforms from the corresponding UVOST log and the fill color of the bubble matches the fill color from the depth specific waveform associated with that bubble. The larger the

bubble, the higher the %RE associated with that particular depth. Background and natural fluorescence signals are included in the clustering presentation and typically "cluster" in a tight group in the lower right of the cluster plot. Low NAPL signals will "drift away" from this group. The further away each waveform's bubble is from the background cluster, the higher the likelihood it represents NAPL. In addition, bubbles that cluster close together typically represent the same NAPL type and/or degree of weathering.

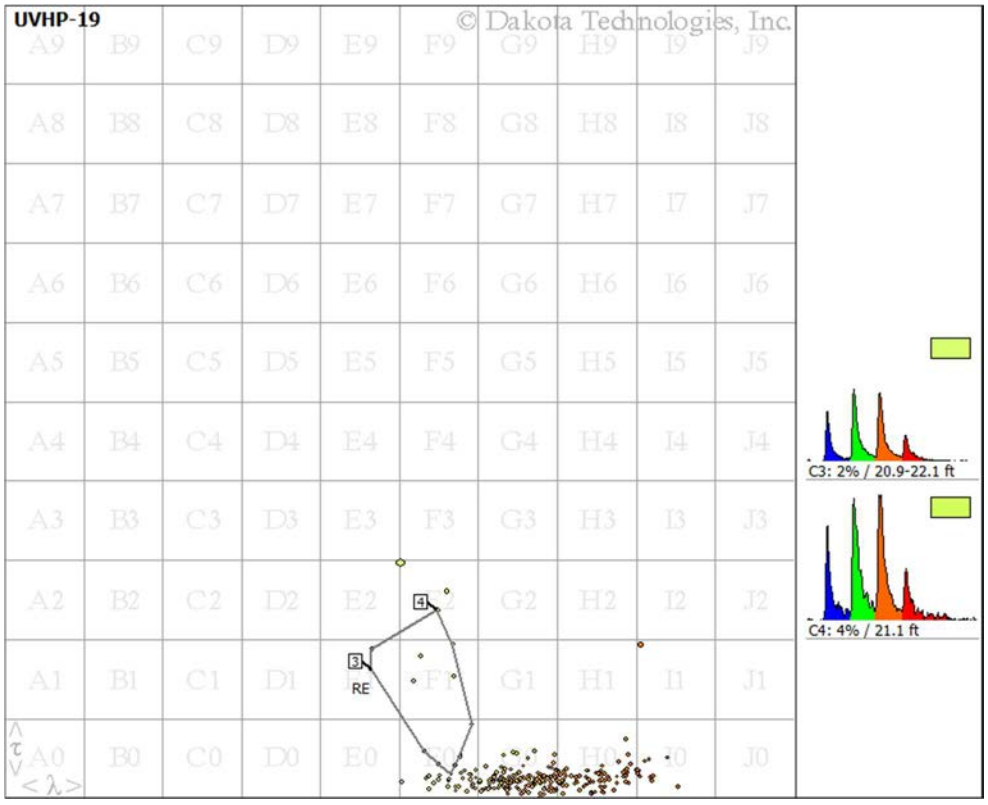


Figure 6: The image above, from location UVHP-19, shows the typical cluster plot diagram from the site. The tight cluster of "bubbles" located in the lower right, grids I0 and J0, of the cluster plot represents the background fluorescence encountered throughout the fluorescence versus depth log at this location. The highest %RE bubbles are located in grids E2 and F2, which seems typical of the reformate at this site.

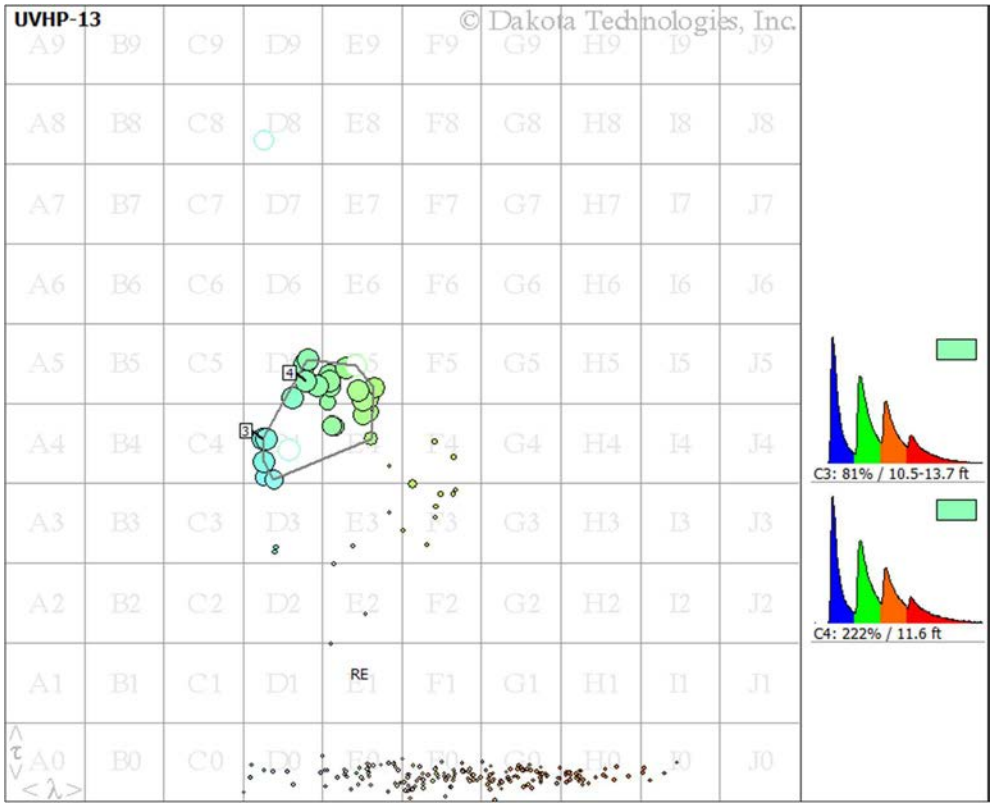


Figure 7: This cluster plot from location UVHP-13, shows a slight weathering trail stretching from the highest %RE bubbles and drifting down and right towards the background cluster. In this cluster, the highest %RE bubbles are in grids D5 and E5, revealing a blue-dominant waveform when compared to Figure 4. This cluster is likely representative of a gasoline mixture.

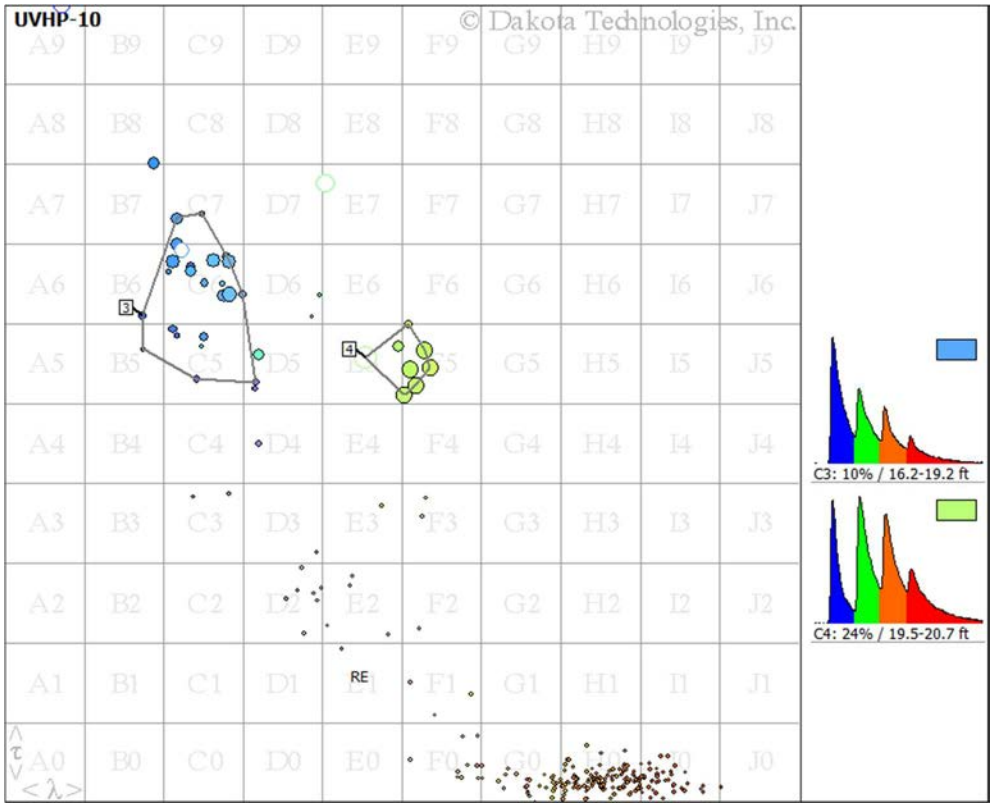


Figure 8: The cluster plot from location UVHP-10 shows even greater blue-dominant characteristics in the waveforms. This generally only seen in very light NAPLs.

Please do not hesitate to contact Randy St. Germain for additional assistance with interpretation of your site's UVOST logs. He can be reached at stgermain@dakotatechnologies.com or 701-237-4908 and can assist you with unlocking the wealth of information in your UVOST logs with regard to fuel type, degree of weathering, removal of false positives, isolation of certain target fluorescence types from other types, relating NAPL saturation to %RE, and other common UVOST site data interpretation/processing approaches.

5.0 GPS Data/Survey Control

No GPS data was collected by Dakota during this visit.

6.0 Limitations

The UVOST® system is limited in that it responds in a highly preferential manner to non-aqueous phase liquid petroleum, making it an ideal tool for source delineation. UVOST® does not typically respond (to any useful degree) to dissolved phase VOCs or SVOCs. In addition, the soil matrix (soil grain size) can influence how a NAPL fluoresces. UVOST® responses are typically higher on coarse or poorly sorted sands than in fine grain clays and silts. The UVOST® system should never be used to delineate coal tars and creosotes due to a misleadingly small fluorescence response (due to internal quenching of fluorescence) while simultaneously encountering a heightened response to dissolved phase PAHs in and near to the heavy NAPL, which can easily be misinterpreted as the presence of refined LNAPLs.

The use of specific language to identify UVOST® fluorescence such as LNAPL, gasoline, diesel or other specific petroleum, oil or lubricant types are intended to describe the fluorescence response within the limited context of the UVOST® data set, and the actual presence of these NAPLs must be verified with other lines of evidence (sampling, history, etc.) to confirm any stated interpretations. Signal identified and listed in this report as false positives, natural soil, etc. should also be viewed within these same constraints because extremely weathered fuels can occasionally mimic natural soil fluorescence.

The analysis and opinions expressed in this report are based upon data obtained from the specific test locations and from other information discussed in this report. Exceptions, if any, are discussed in the accompanying comments section of this report. This report is prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted practices. Reported results shall not be reproduced, except in full, without written approval of Dakota. No warranties, expressed or implied, are intended or made.

The hydraulic data acquired from UVOST® tool should be reviewed in conjunction with representative soil samples to best understand soil behavior.

Appendix A

UVOST-HP® Summary Log

DAKOTA TECHNOLOGIES

UVOST®-HP Field Summary Log

PES Complex

Philadelphia, PA

File Log ID	Date / Time	Pre-Probe (ft)	Final Depth (ft)	Max Signal (%RE)	Max Signal Depth (ft)	Initial RE Area (pVs)	Background Area (pVs)	Stable Dissipation (yes or no)	Calculated Water Table (bgs)	Fluorescence Top - Bottom (ft)
UVHP-01	7/12/22 9:19 AM	N/A	21.0	287	17.3	12056	5	N/A	N/A	16.3-19.0
UVHP-02	7/12/22 11:37 AM	N/A	25.0	123	17.9	12682	0	N/A	N/A	16.5-19.8
UVHP-03	7/12/22 12:49 PM	N/A	25.1	87	16.4	11746	0	N/A	N/A	10.3, 15.5-19.5
UVHP-04	7/12/22 2:10 PM	N/A	17.6	3	1.6	12367	13	N/A	N/A	0.8-1.8, 17.2-17.6
UVHP-04b	7/14/22 1:18 PM	17	25.0	10	17.6	10409	15	N/A	N/A	16.7-17.9
UVHP-05	7/12/22 3:31 PM	N/A	25.0	68	15.9	11561	8	N/A	N/A	13.1-18.3
UVHP-06	7/12/22 4:17 PM	N/A	25.0	190	19.2	11664	4	N/A	N/A	18.0-20.5
UVHP-07	7/13/22 8:07 AM	N/A	16.5	3	0.6	12269	-4	N/A	N/A	N/A
UVHP-07b	7/14/22 11:54 AM	18	25.0	24	18.5	11149	16	N/A	N/A	17.9-20.9
UVHP-08	7/13/22 8:41 AM	N/A	16.5	1	1.4	12416	-1	N/A	N/A	1.3-1.4
UVHP-08b	7/14/22 12:42 PM	17	25.1	5	19.0	10564	5	N/A	N/A	18.0-20.8
UVHP-09	7/13/22 9:25 AM	N/A	25.0	169	19.7	12275	1	N/A	N/A	0.7-2.2, 17.3-23.6
UVHP-10	7/13/22 10:10 AM	N/A	25.0	58	19.6	11915	10	N/A	N/A	1.2-2.0, 16.0-21.1
UVHP-11	7/13/22 11:07 AM	N/A	20.4	1	17.0	12274	17	N/A	N/A	1.5, 17.0-17.8
UVHP-12	7/13/22 11:49 AM	N/A	21.7	18	12.3	11621	-5	N/A	N/A	11.8-14.8
UVHP-13	7/13/22 12:44 PM	N/A	21.5	222	11.6	11375	-1	N/A	N/A	10.0-15.0
UVHP-14	7/13/22 1:22 PM	N/A	21.8	166	14.2	11933	15	N/A	N/A	12.3-16.4
UVHP-15	7/14/22 10:00 AM	N/A	17.5	1	1.9	10335	16	N/A	N/A	1.4-1.8
UVHP-15b	7/14/22 10:29 AM	17	17.5	2	1.9	10577	21	N/A	N/A	1.5-2.3
UVHP-15c	7/14/22 11:09 AM	N/A	28.0	282	21.4	10255	9	N/A	N/A	20.0-25.0
UVHP-16	7/14/22 4:23 PM	5	25.1	18	22.4	12494	40	Yes	19.6	21.2-23.2
UVHP-17	7/14/22 3:09 PM	5	25.0	1	4.6	10202	24	Yes	20.0	N/A
UVHP-18	7/14/22 2:33 PM	5	25.1	2	22.1	10380	19	Yes	20.4	22.0-22.3
UVHP-19	7/14/22 1:58 PM	5	25.1	8	22.1	10592	8	Yes	19.6	20.9-22.2
UVHP-20	7/14/22 9:05 AM	N/A	25.0	251	19.9	11001	3	Yes	18.2	1.4-1.6, 17.9-23.8
UVHP-21	7/14/22 8:20 AM	N/A	25.0	301	17.2	10677	0	Yes	16.1	1.1-1.6, 15.0-23.0
UVHP-22	7/13/22 1:57 PM	N/A	21.9	27	12.4	11134	9	N/A	N/A	8.5-10.3, 12.1-14.0
UVHP-23	7/13/22 2:46 PM	N/A	21.7	32	12.1	11987	7	N/A	N/A	11.5-14.2
UVHP-24	7/14/22 7:34 AM	N/A	17.9	6	0.2	10609	-18	N/A	N/A	12.3-12.8
	Total Footage (this sheet)		**656.7**							

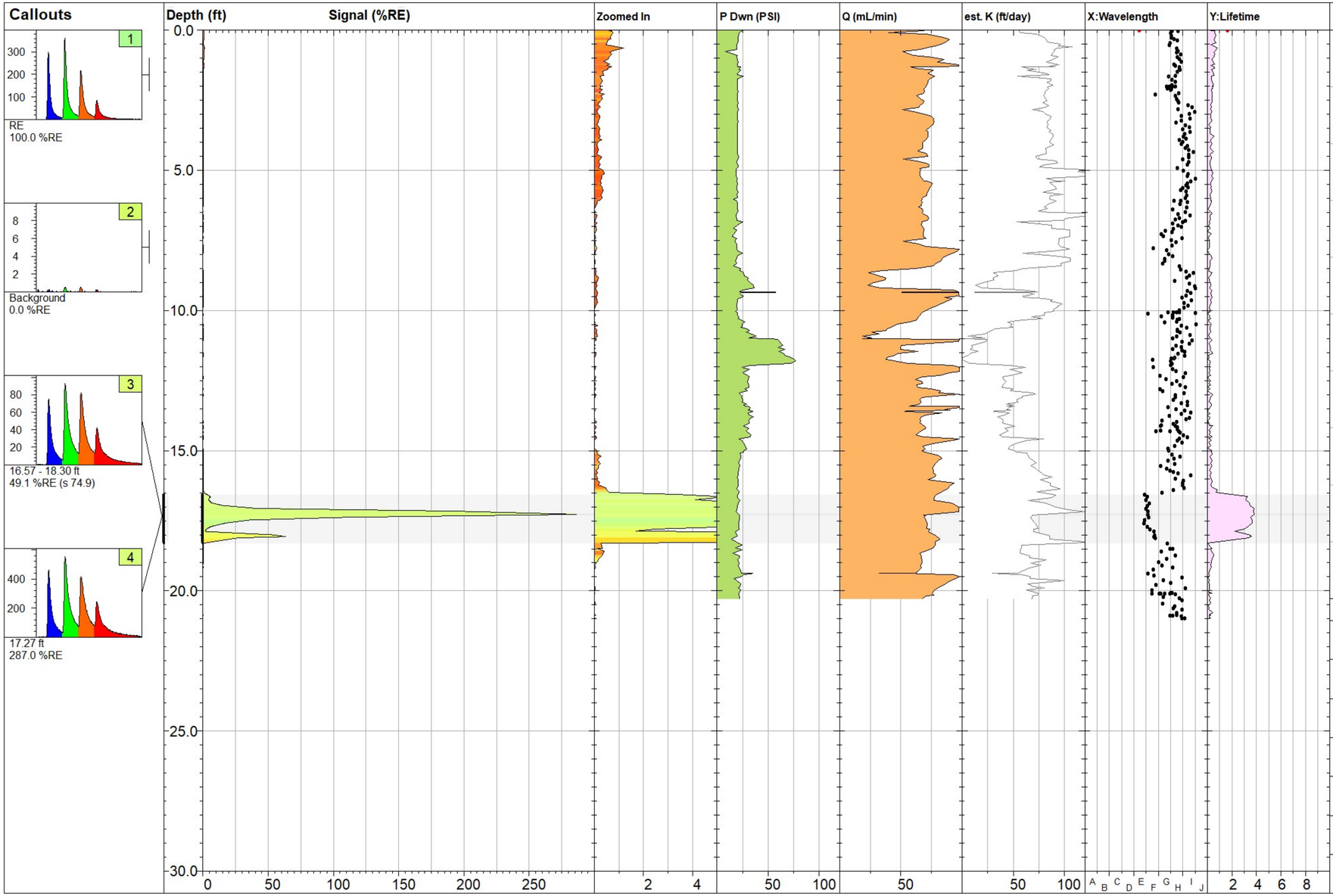
(1) Signal responses in the indicated pre-probed regions may not be accurate due to soil disturbance

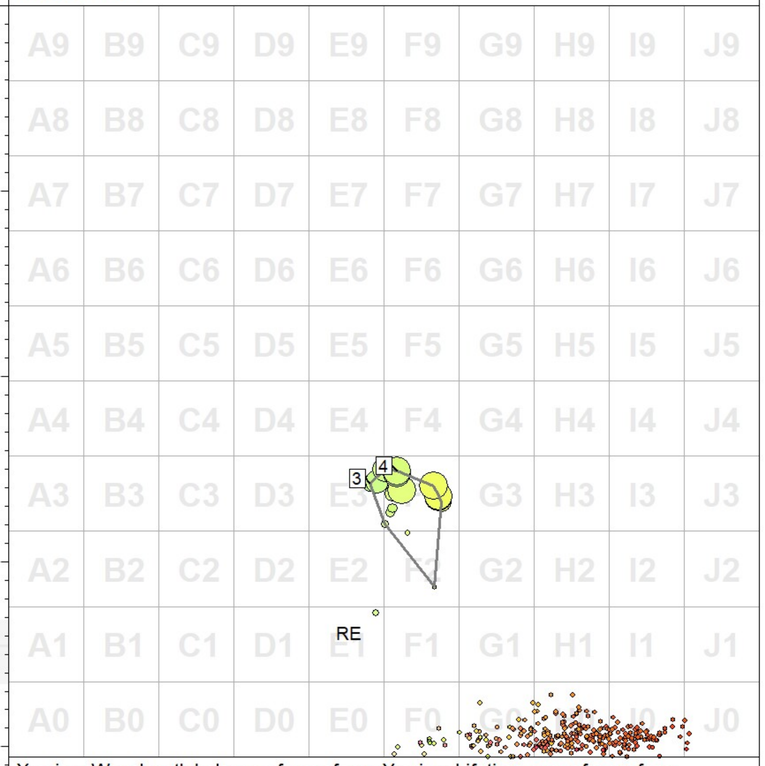
*Indicates that water table data was manually entered from adjacent well measurement (not derived from a dissipation test calculation)

Appendix B

UVOST® Logs at 300% RE with Cluster Plots

DAKOTA TECHNOLOGIES





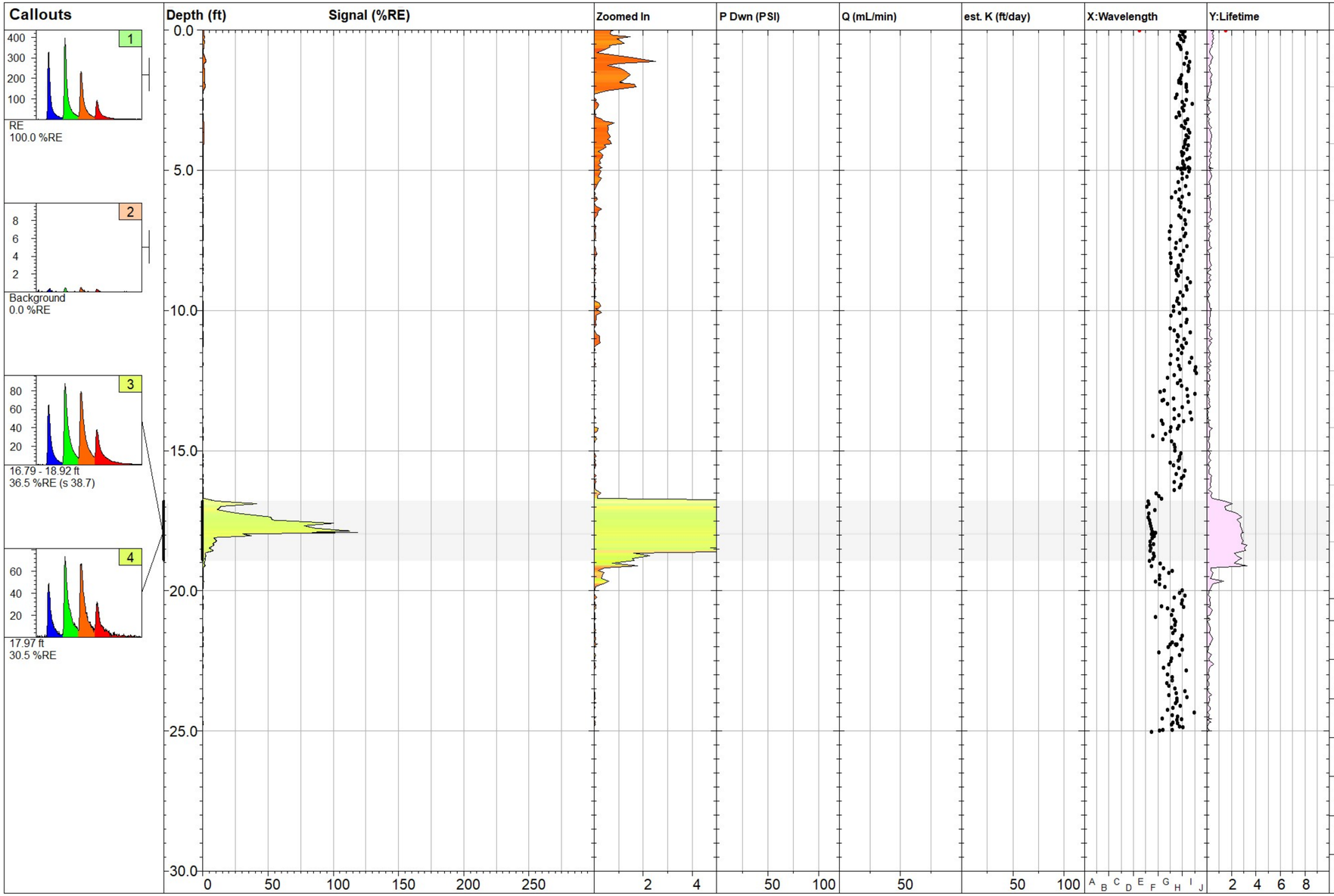
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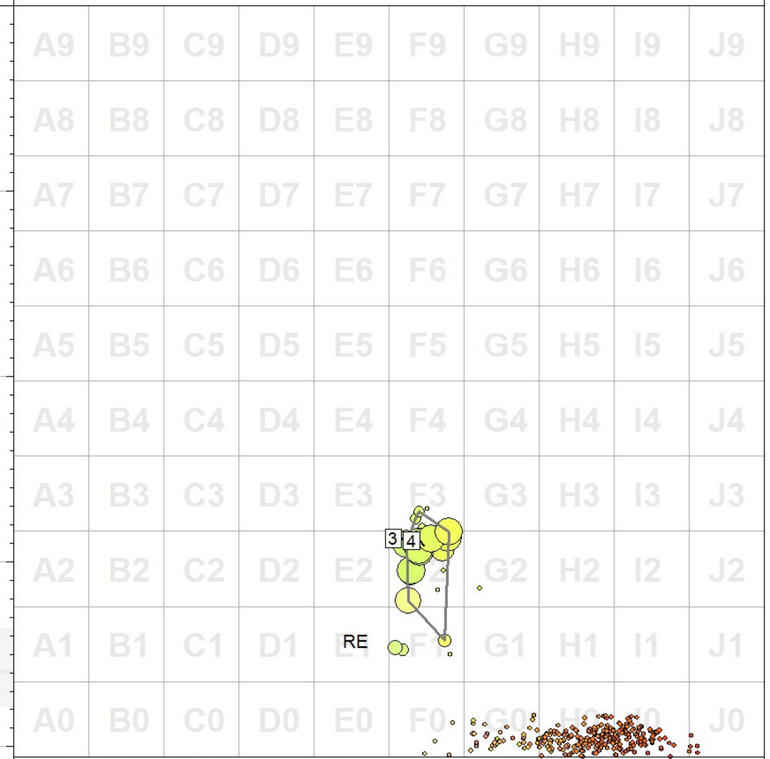
UVOST® By Dakota

Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.7.1)

Log: **UVHP-01**

Site: **PES Complex**	Date & Time: **2022-07-12 09:19 EDT**
Client: **Stantec**	Job:
Final Depth: **20.97 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **287.0 %RE @ 17.27 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

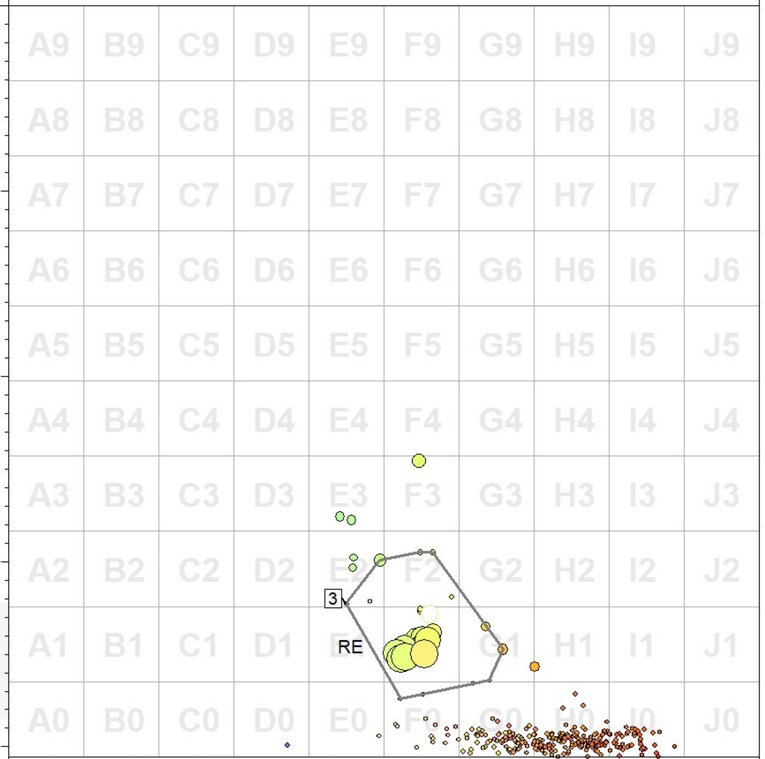
UVOST® By Dakota

Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.7.1)

Log: **UVHP-02**

Site: **PES Complex**	Date & Time: **2022-07-12 11:37 EDT**
Client: **Stantec**	Job:
Final Depth: **25.02 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **123.0 %RE @ 17.91 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

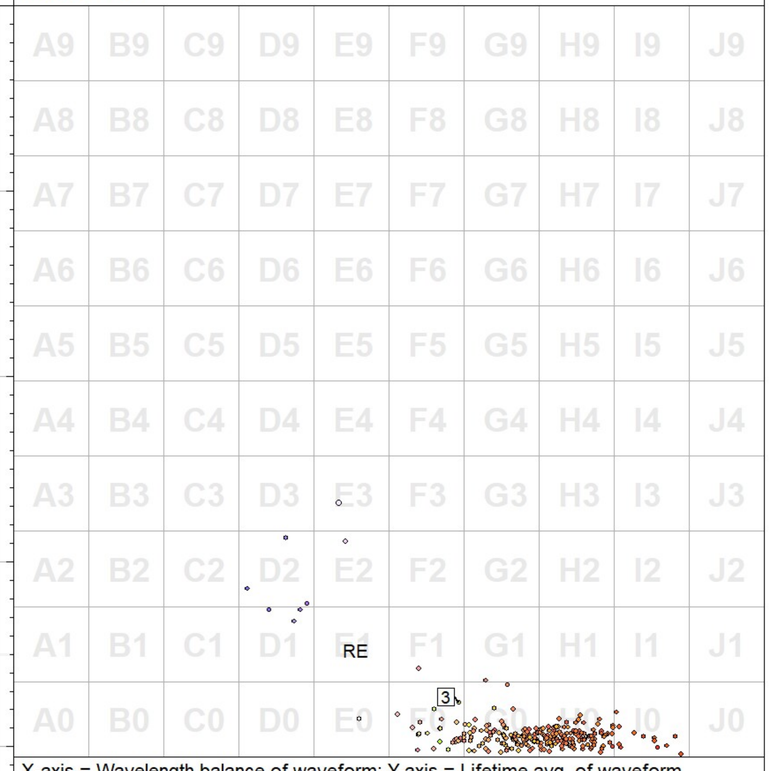
UVOST® By Dakota

Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.7.1)

Log: **UVHP-03**

Site: **PES Complex**	Date & Time: **2022-07-12 12:49 EDT**
Client: **Stantec**	Job:
Final Depth: **25.05 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **87.1 %RE @ 16.37 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





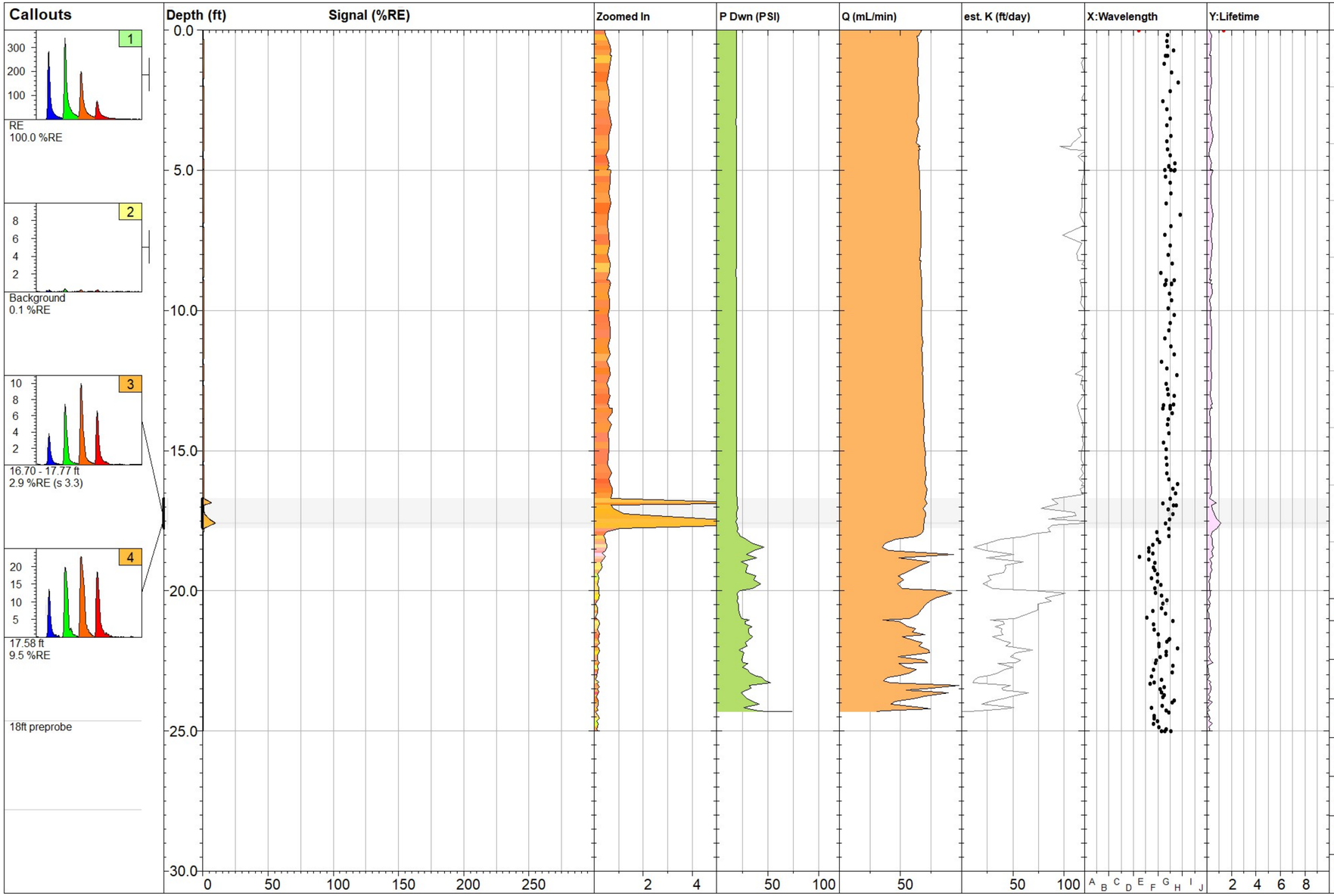
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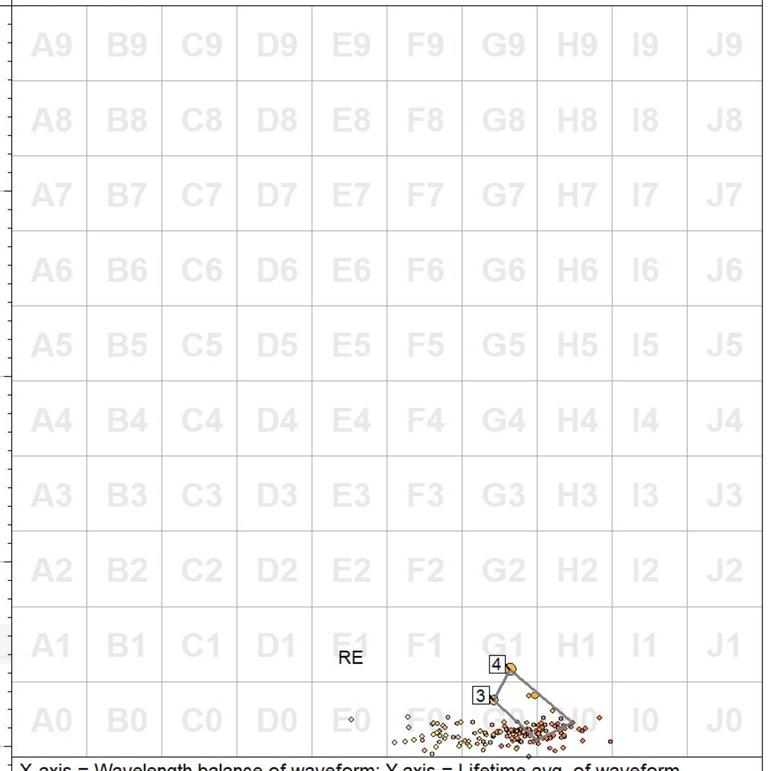
UVOST® By Dakota

Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.7.1)

Log: **UVHP-04**

Site: **PES Complex**	Date & Time: **2022-07-12 14:10 EDT**
Client: **Stantec**	Job:
Final Depth: **17.63 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **2.5 %RE @ 1.55 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





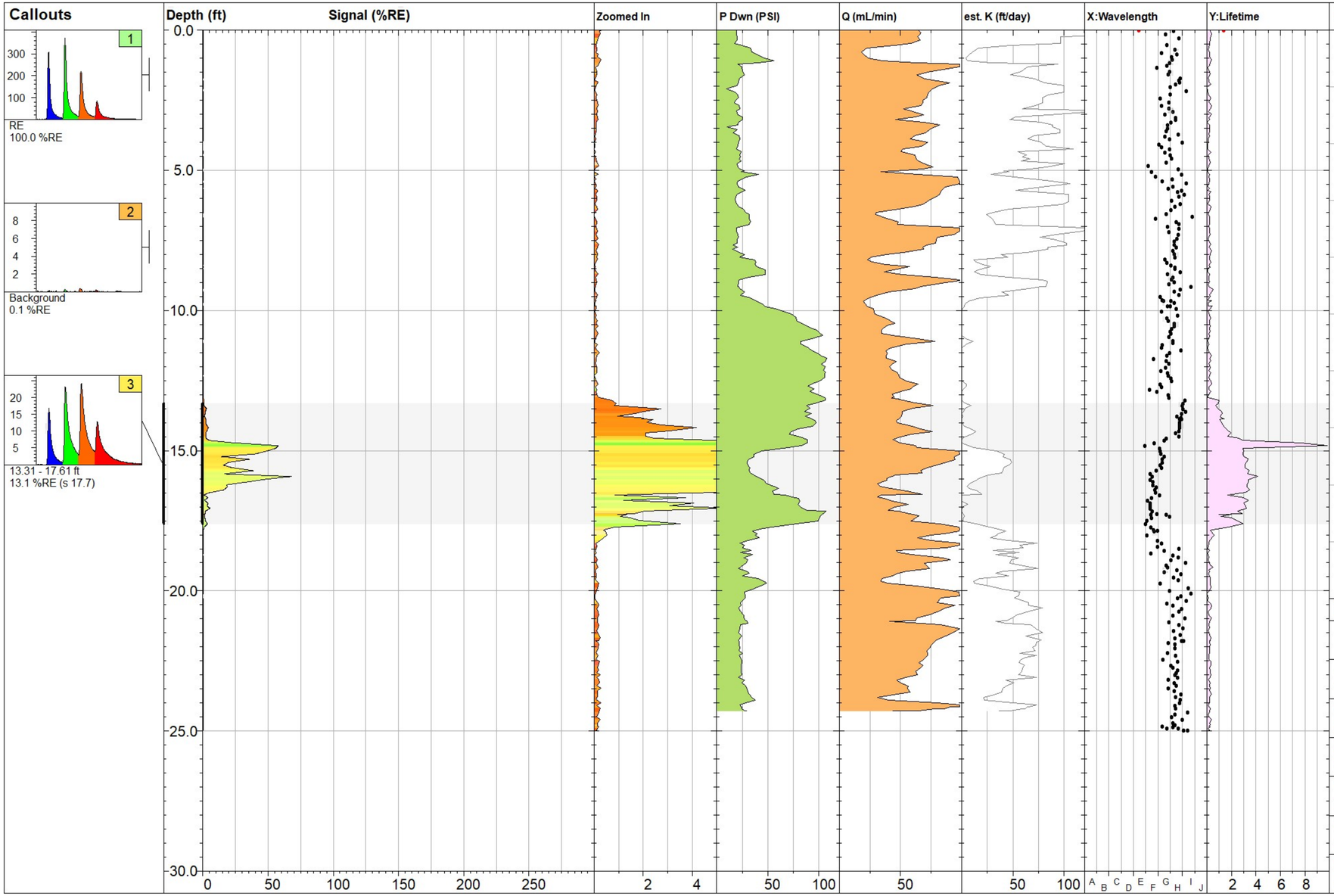
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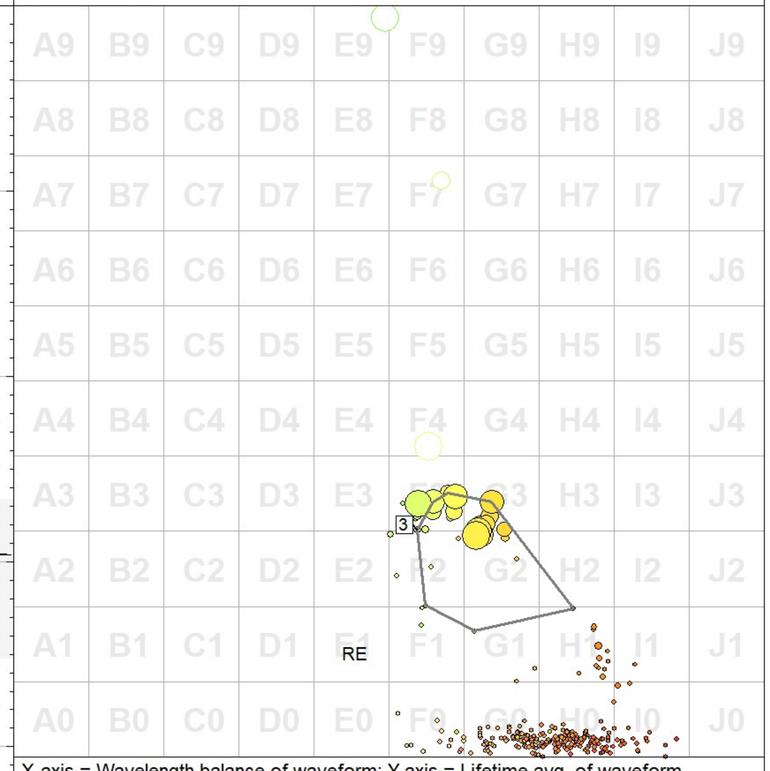
UVOST® By Dakota

Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.7.1)

Log: **UVHP-04b**

Site: **PES Complex**	Date & Time: **2022-07-14 13:18 EDT**
Client: **Stantec**	Job:
Final Depth: **25.00 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **9.5 %RE @ 17.58 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





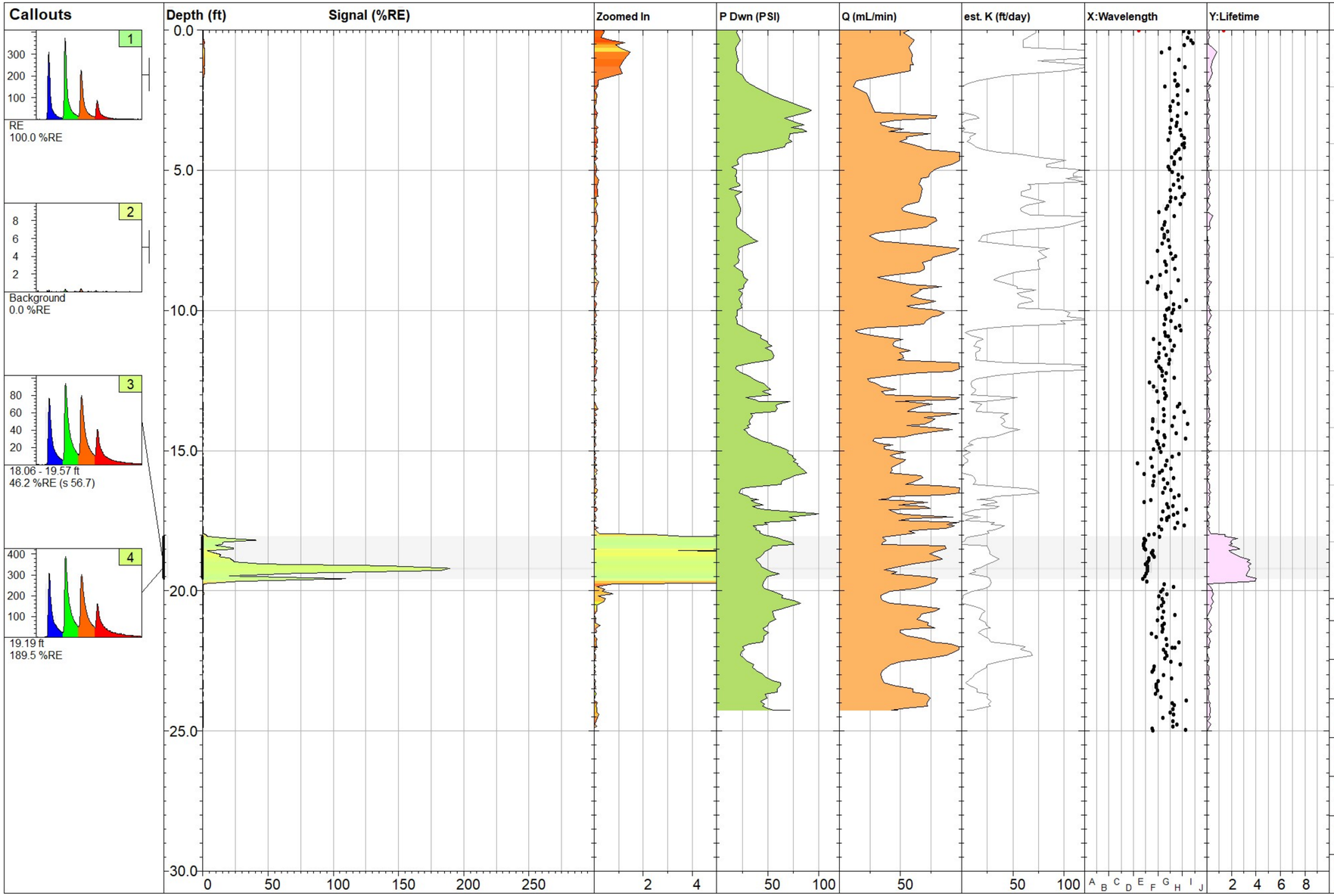
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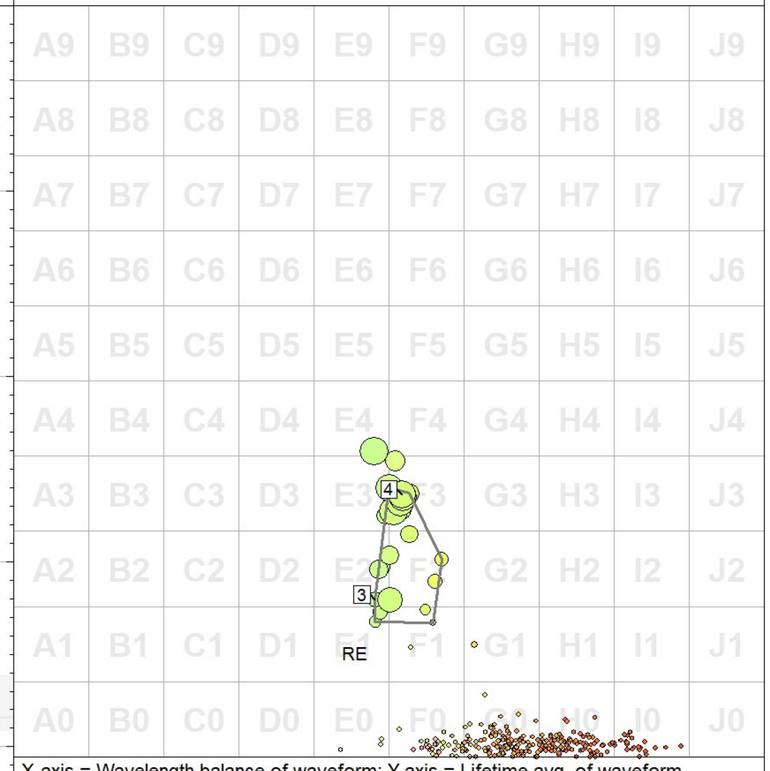
UVOST® By Dakota

Data Presentation Format © 2022 Dakota Technologies, Inc. (v2.7.1)

Log: **UVHP-05**

Site: **PES Complex**	Date & Time: **2022-07-12 15:31 EDT**
Client: **Stantec**	Job:
Final Depth: **24.98 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **67.8 %RE @ 15.92 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





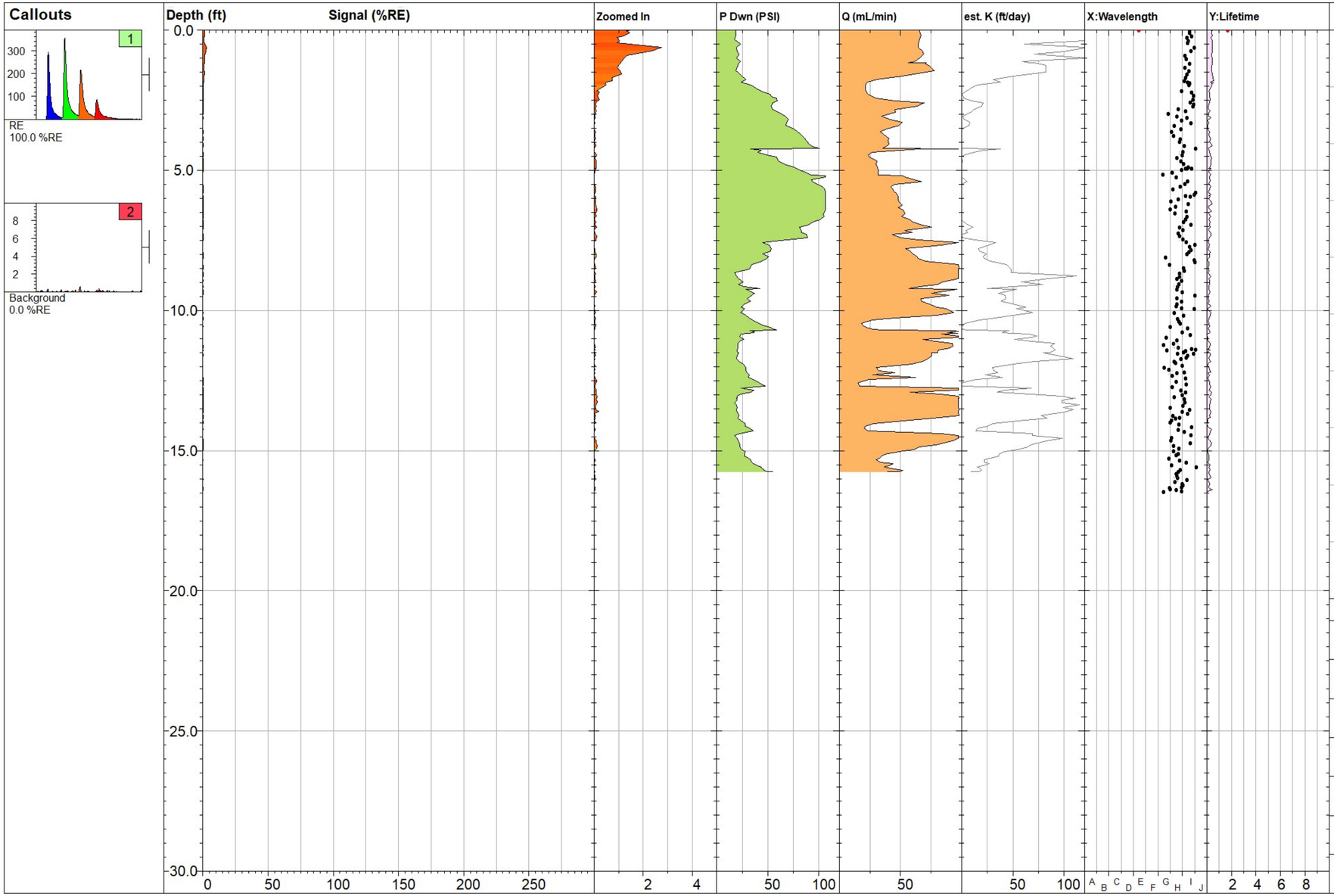
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

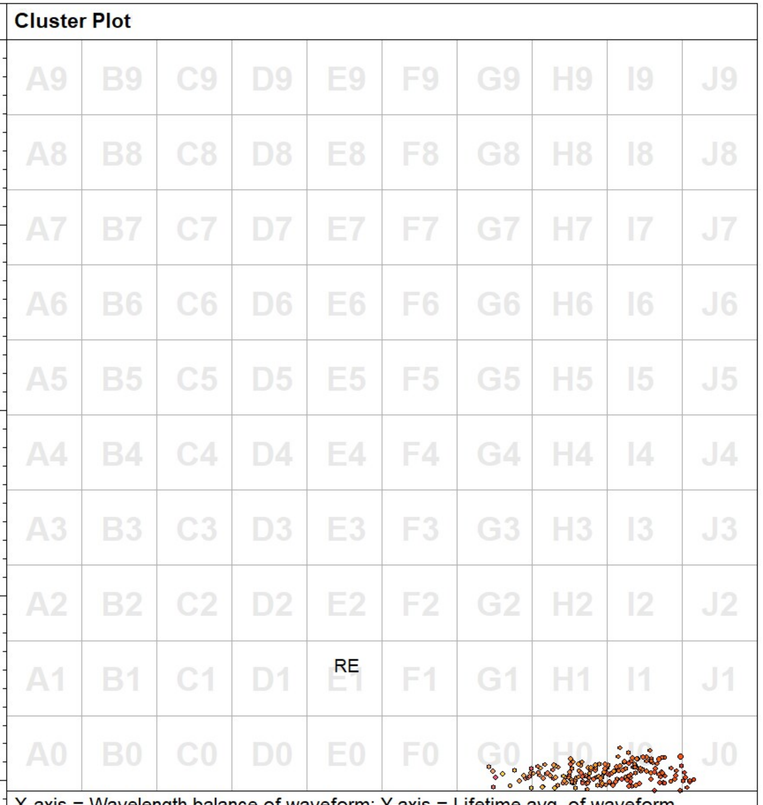
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Log: **UVHP-06**

Site: **PES Complex**	Date & Time: **2022-07-12 16:17 EDT**
Client: **Stantec**	Job:
Final Depth: **24.96 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **189.5 %RE @ 19.19 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





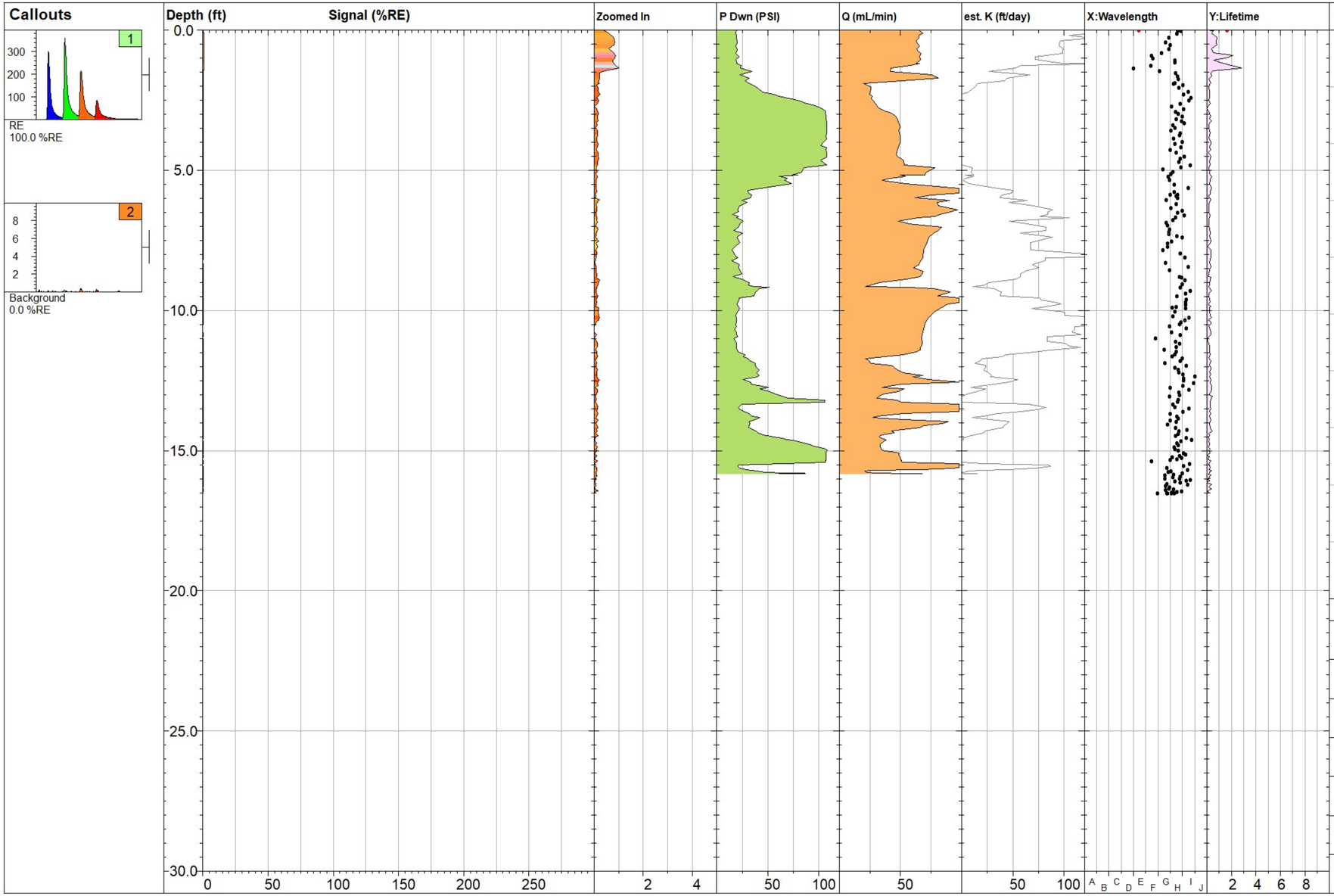
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

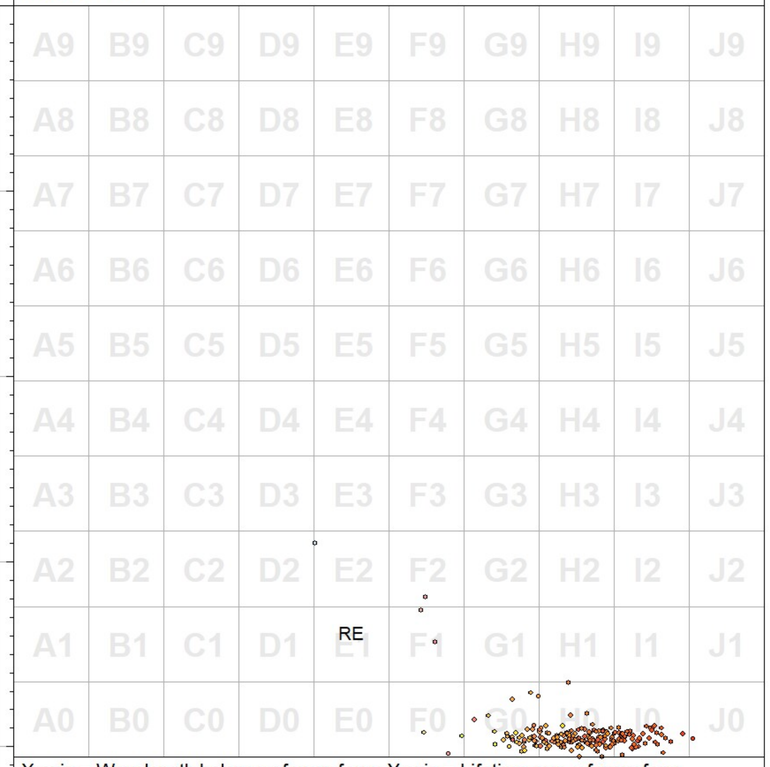
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Log: **UVHP-07**

Site: **PES Complex**	Date & Time: **2022-07-13 08:07 EDT**
Client: **Stantec**	Job:
Final Depth: **16.45 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **2.8 %RE @ 0.61 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





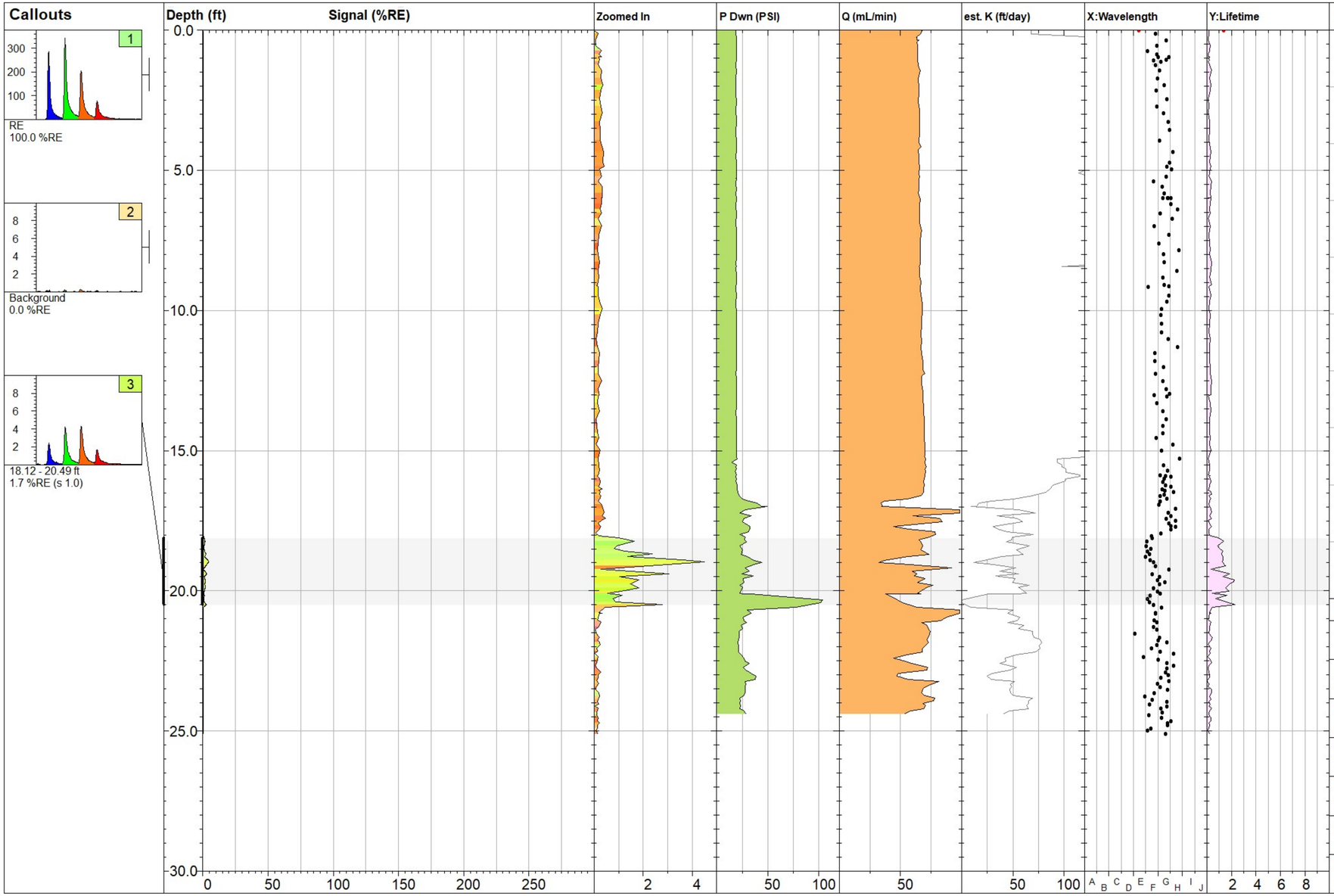
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

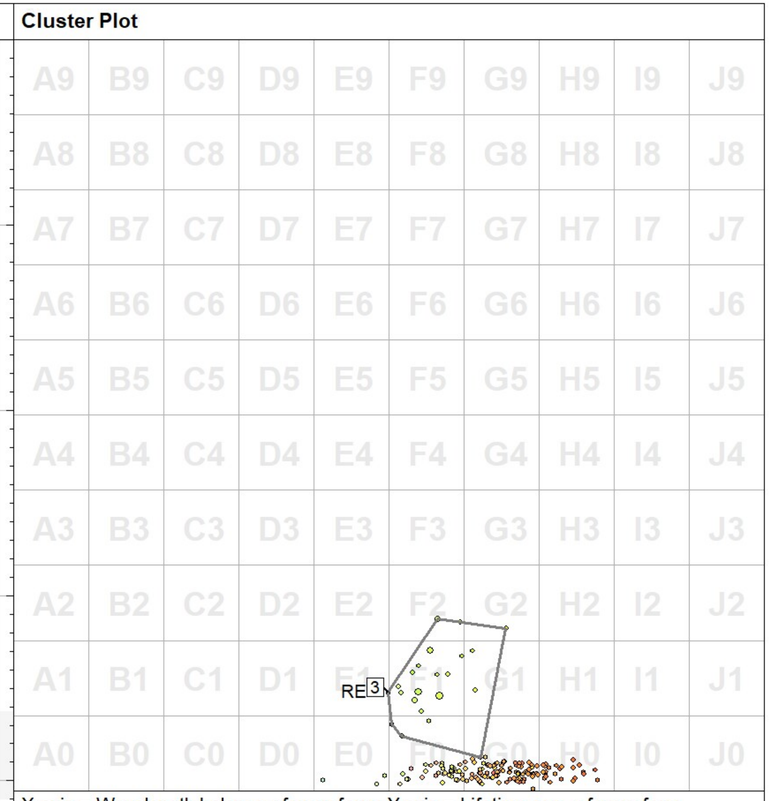
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Log: **UVHP-08**

Site: **PES Complex**	Date & Time: **2022-07-13 08:41 EDT**
Client: **Stantec**	Job:
Final Depth: **16.52 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **1.0 %RE @ 1.35 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





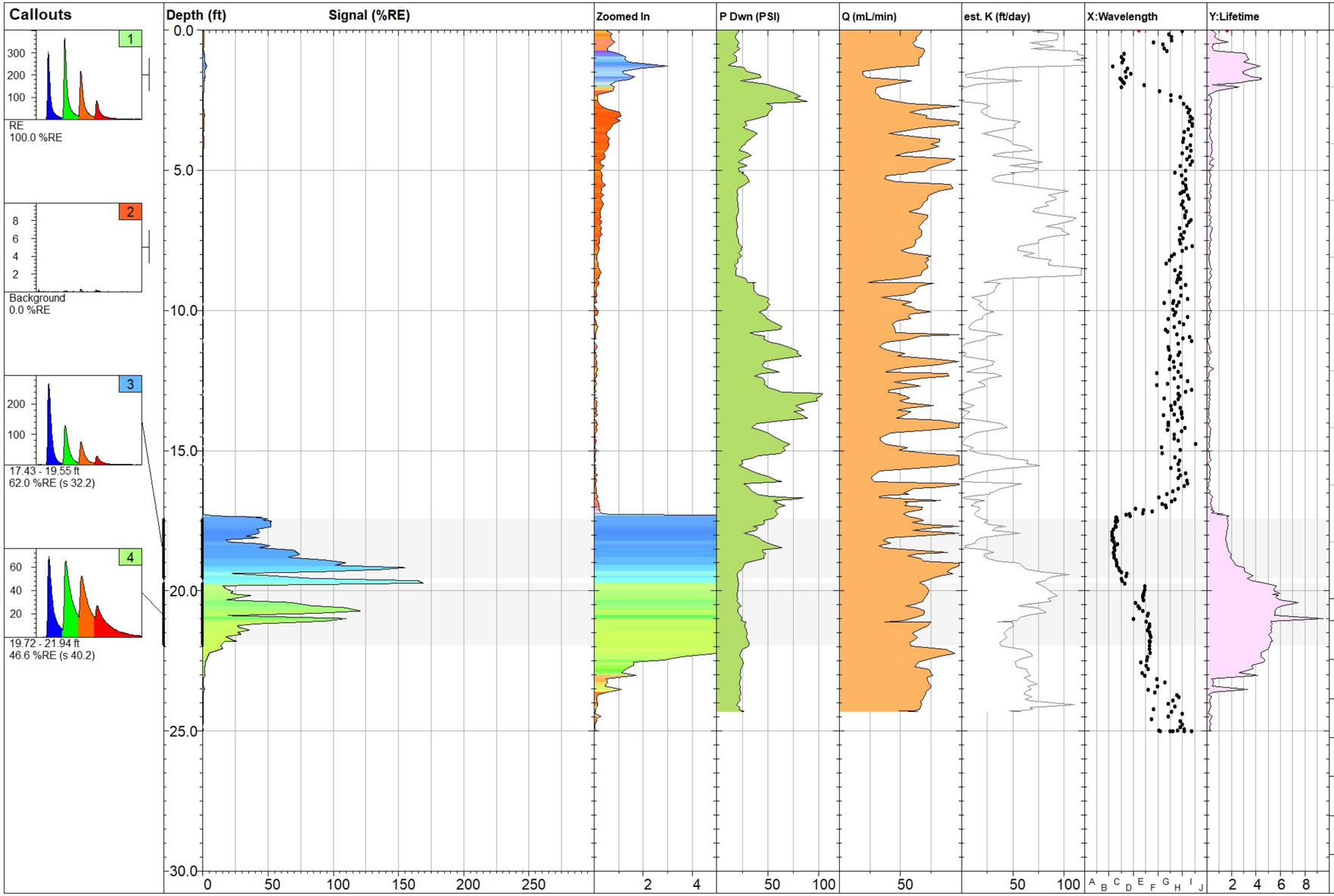
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

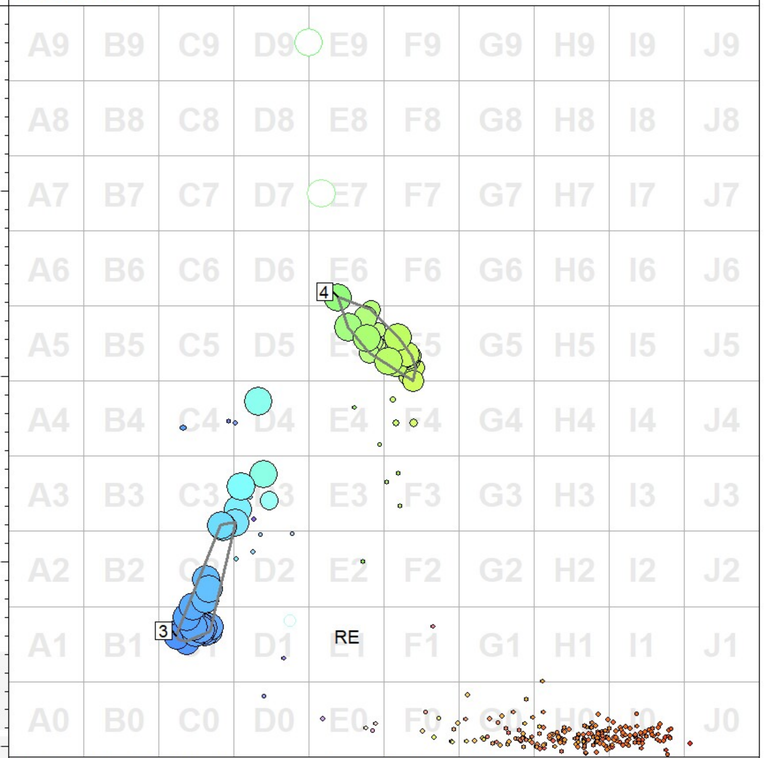
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Log: **UVHP-08b**

Site: **PES Complex**	Date & Time: **2022-07-14 12:42 EDT**
Client: **Stantec**	Job:
Final Depth: **25.08 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **4.5 %RE @ 18.95 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





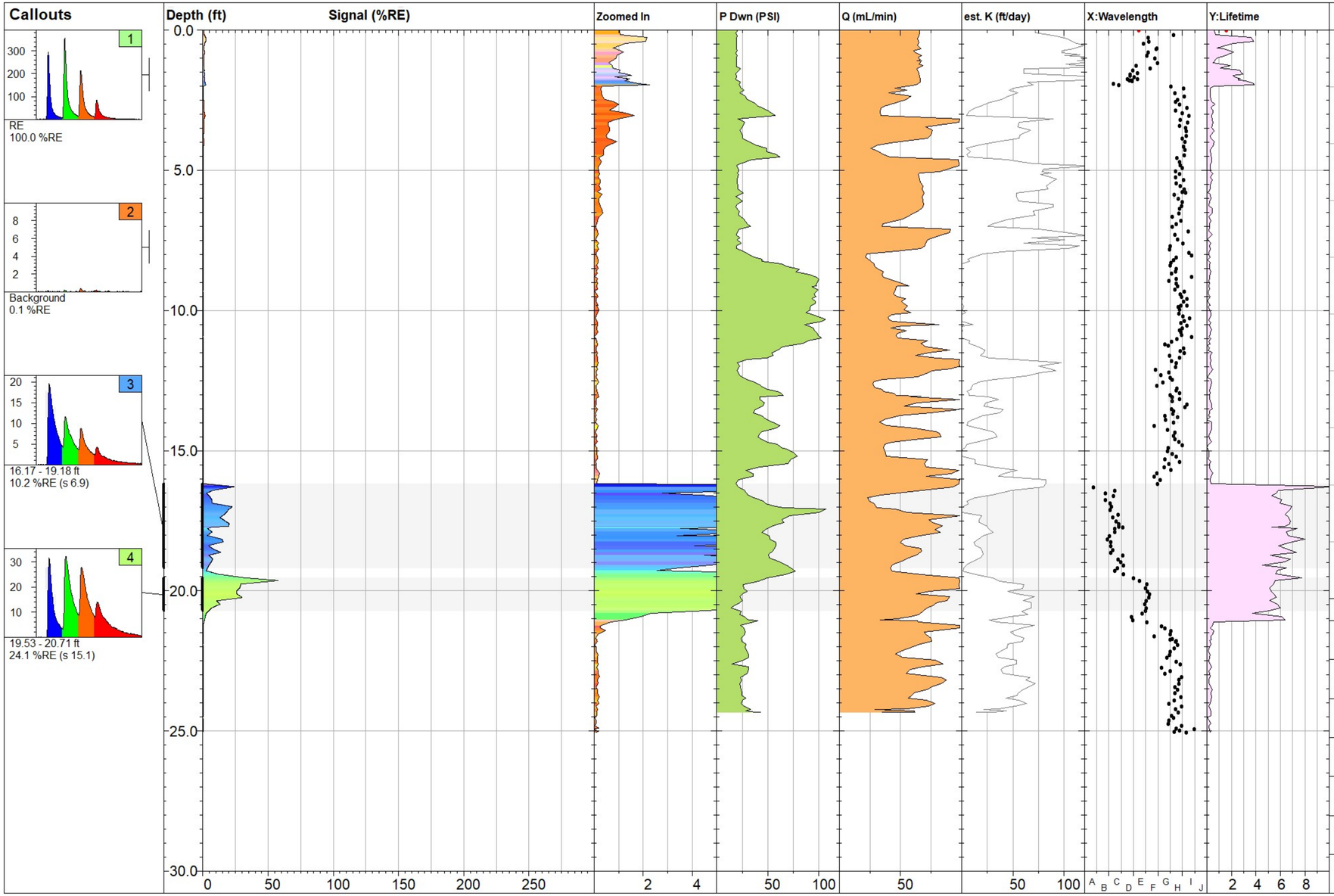
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

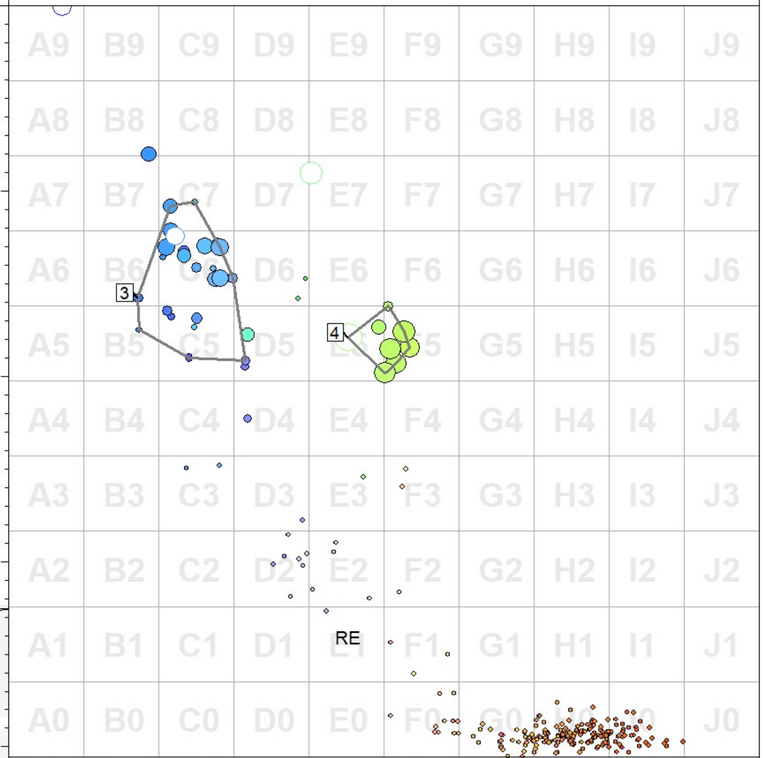
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Log: **UVHP-09**

Site: **PES Complex**	Date & Time: **2022-07-13 09:25 EDT**
Client: **Stantec**	Job:
Final Depth: **25.01 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **168.9 %RE @ 19.72 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





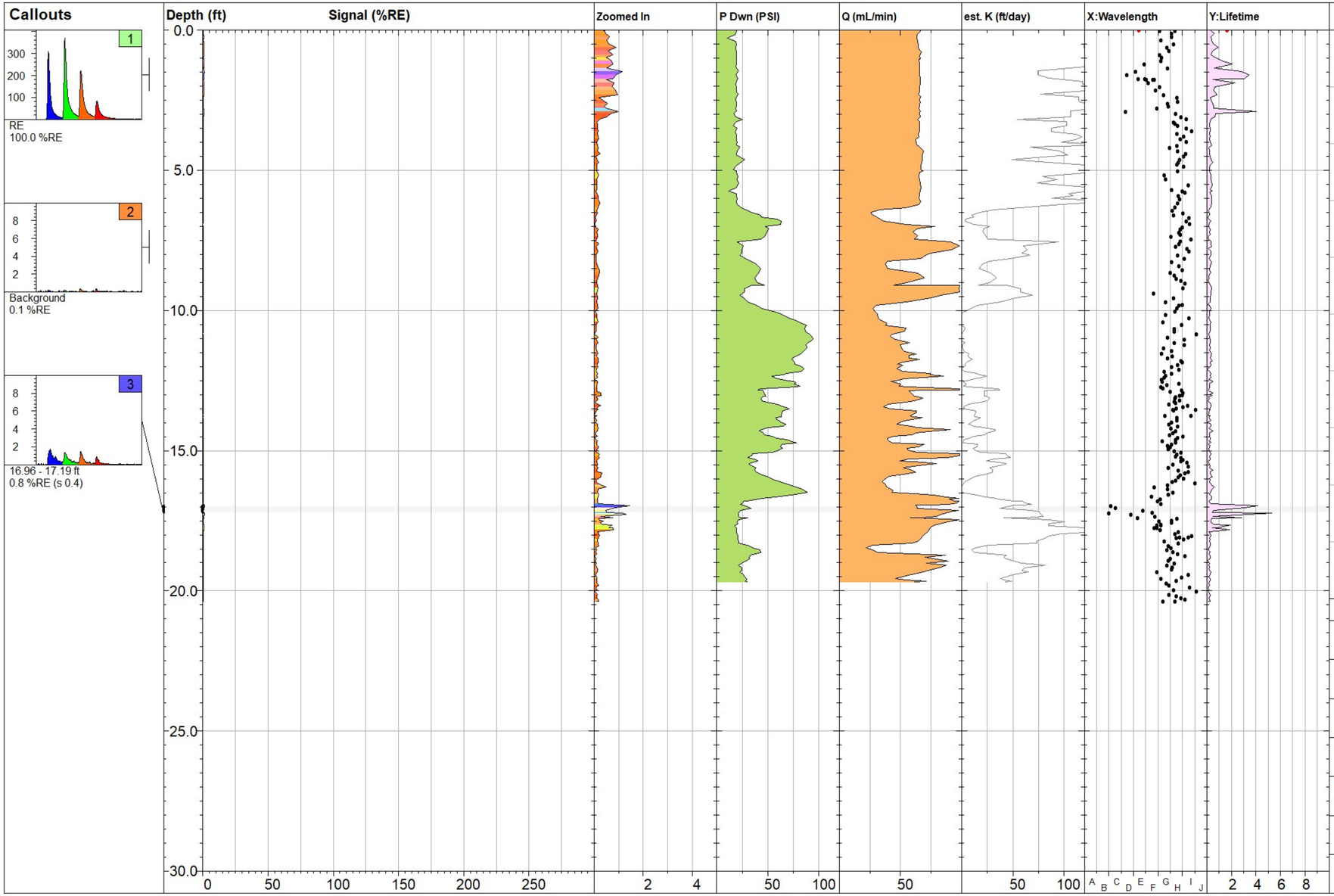
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

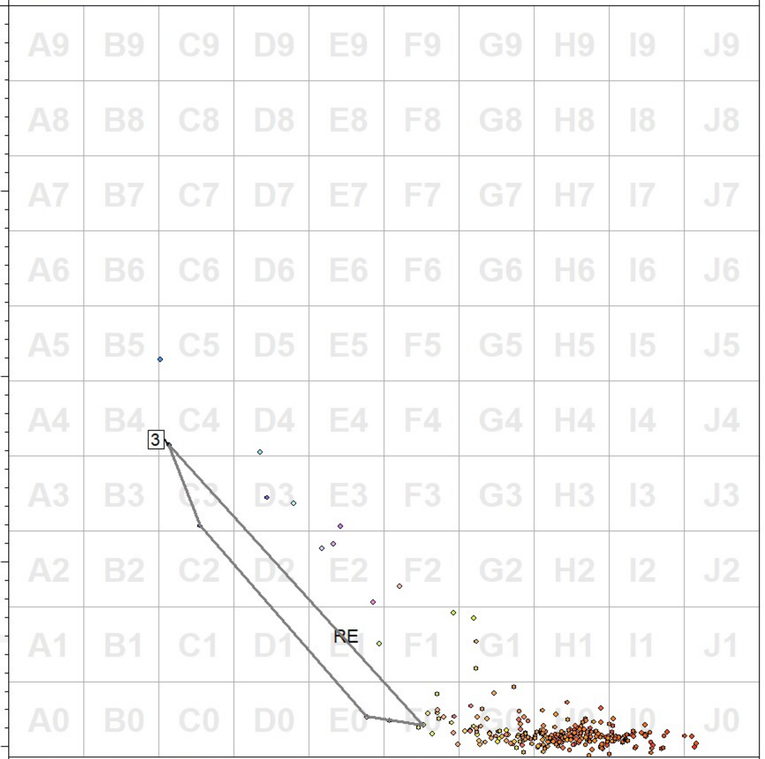
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Log: **UVHP-10**

Site: **PES Complex**	Date & Time: **2022-07-13 10:10 EDT**
Client: **Stantec**	Job:
Final Depth: **25.03 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **58.0 %RE @ 19.63 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





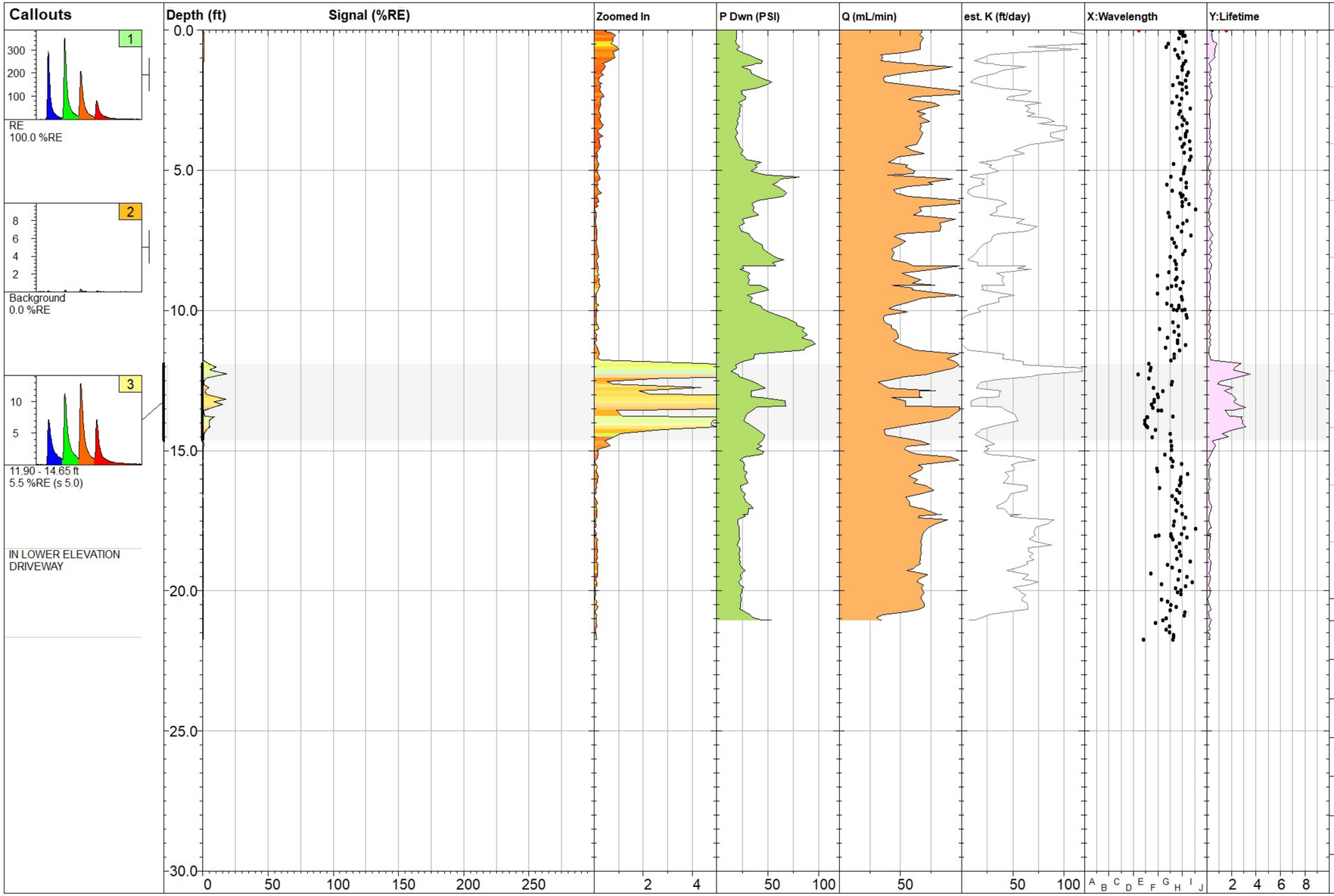
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

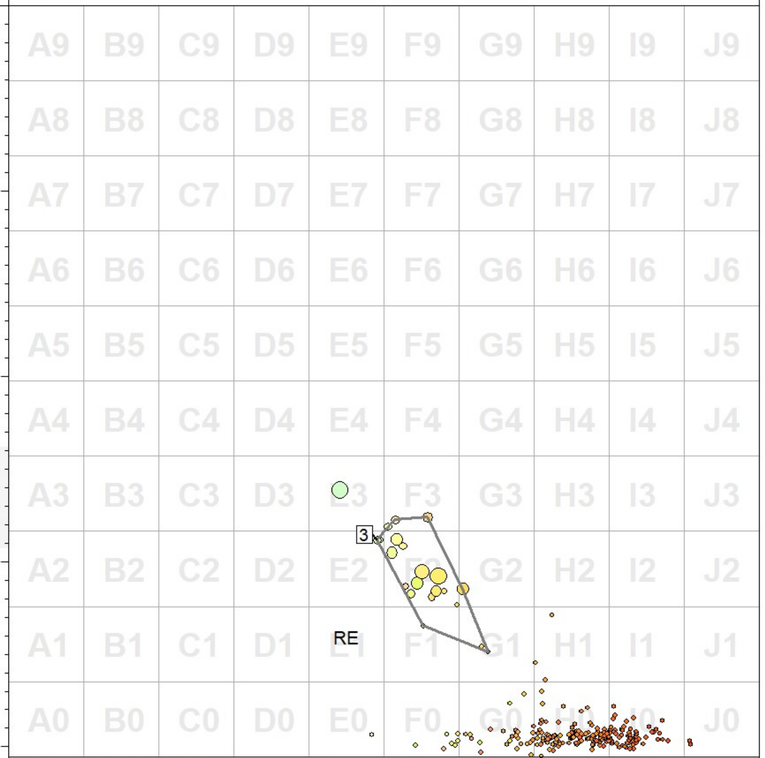
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Log: **UVHP-11**

Site: **PES Complex**	Date & Time: **2022-07-13 11:07 EDT**
Client: **Stantec**	Job:
Final Depth: **20.38 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **1.4 %RE @ 16.96 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





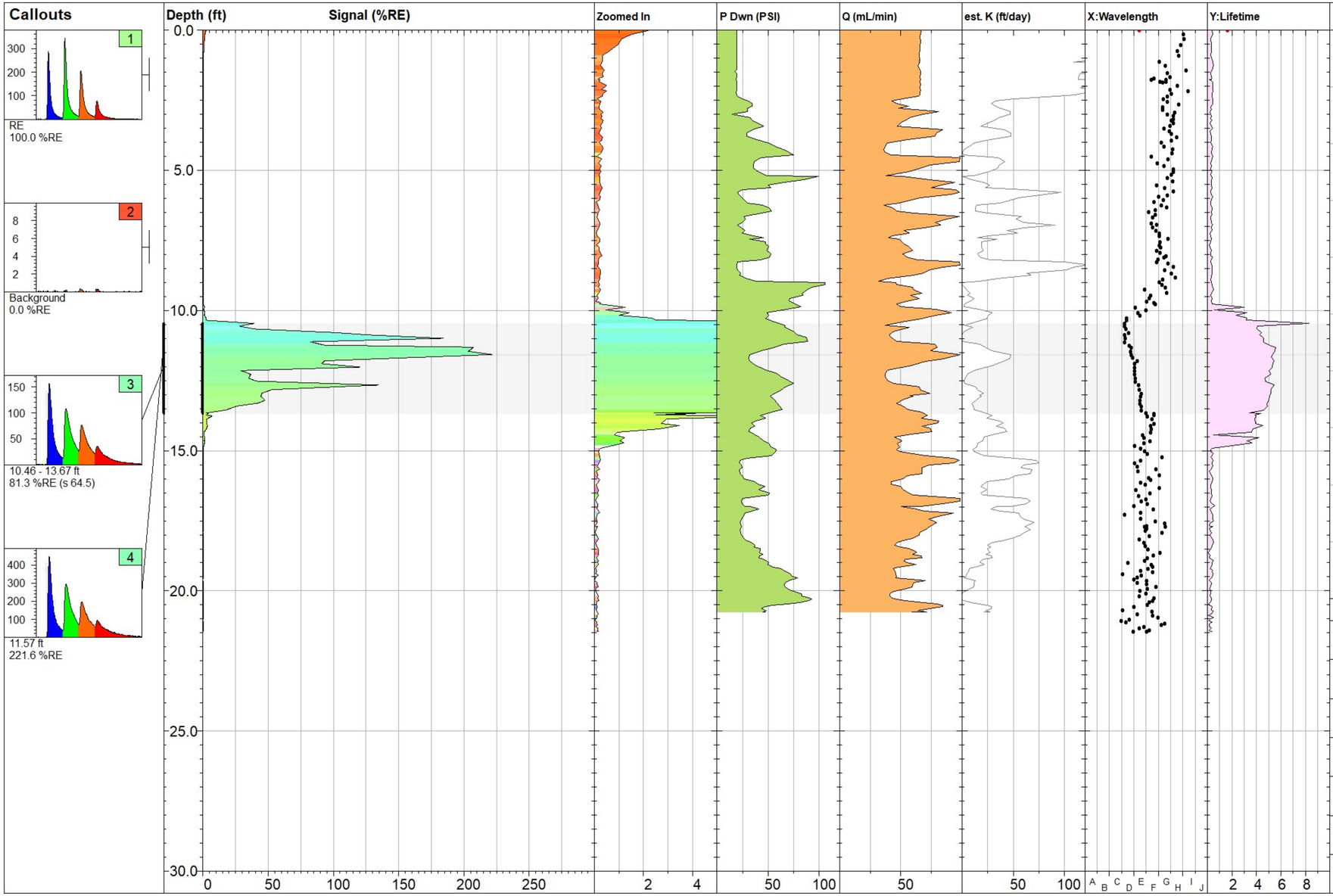
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

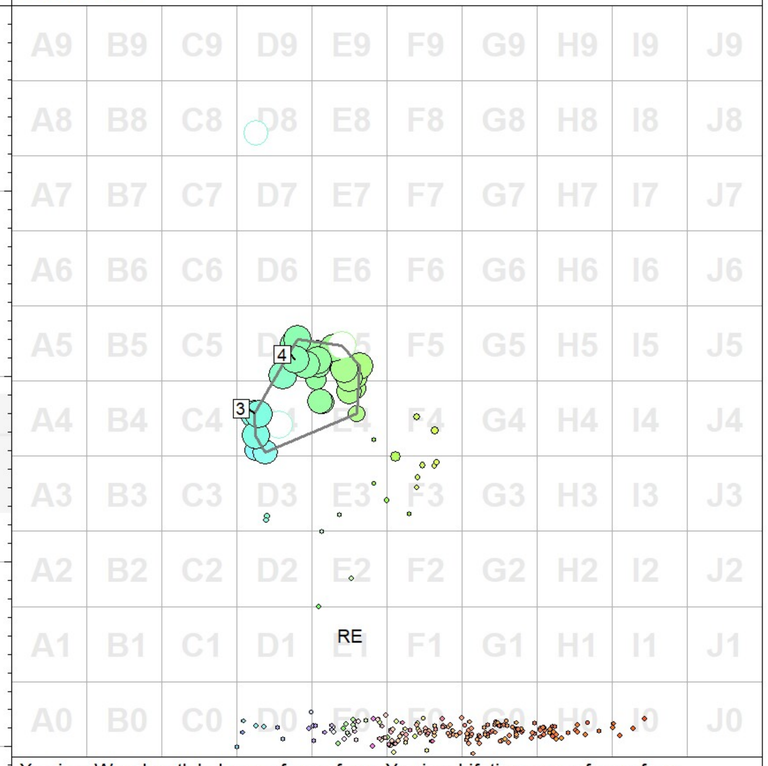
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Log: **UVHP-12**

Site: **PES Complex**	Date & Time: **2022-07-13 11:49 EDT**
Client: **Stantec**	Job:
Final Depth: **21.74 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **18.0 %RE @ 12.26 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





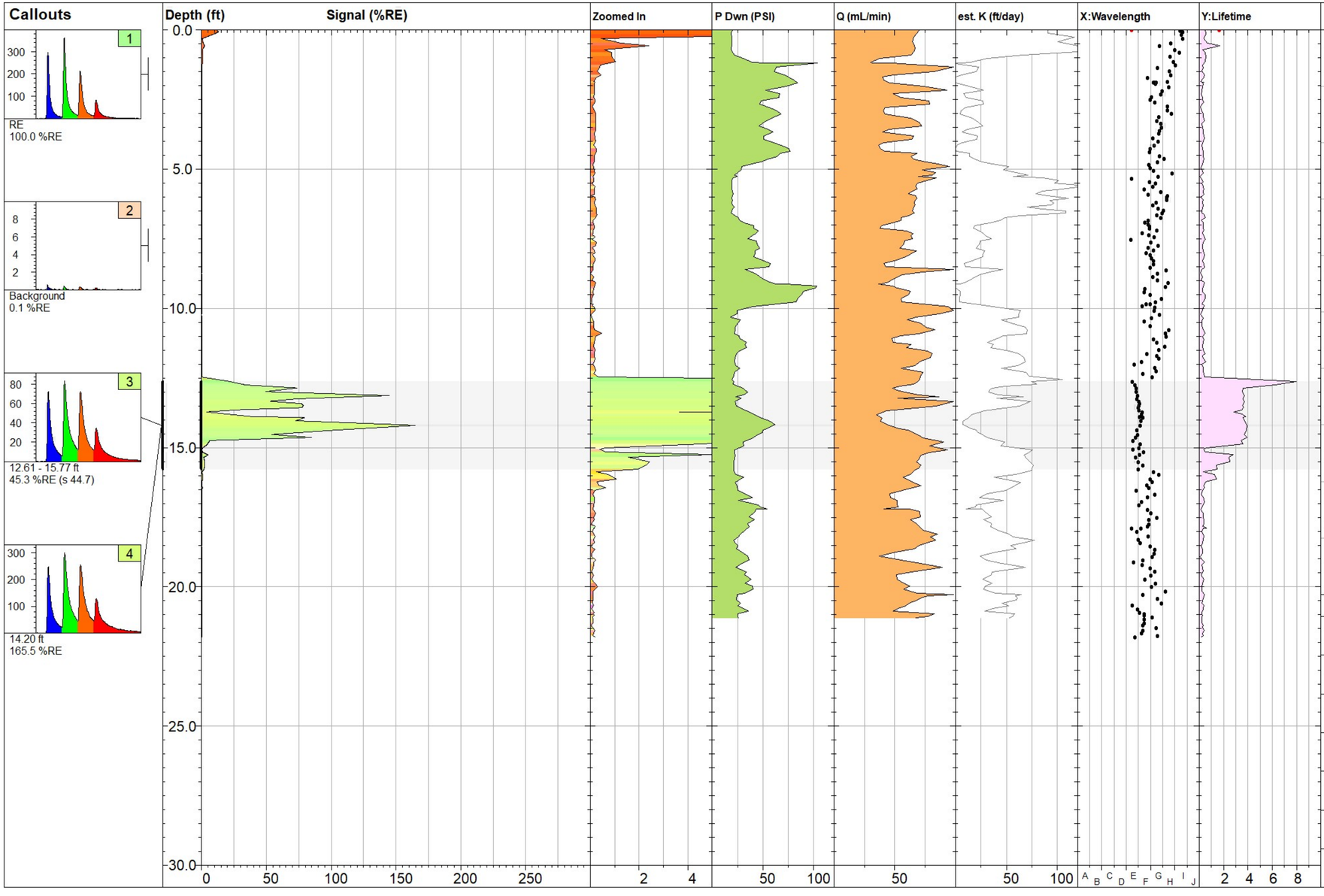
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

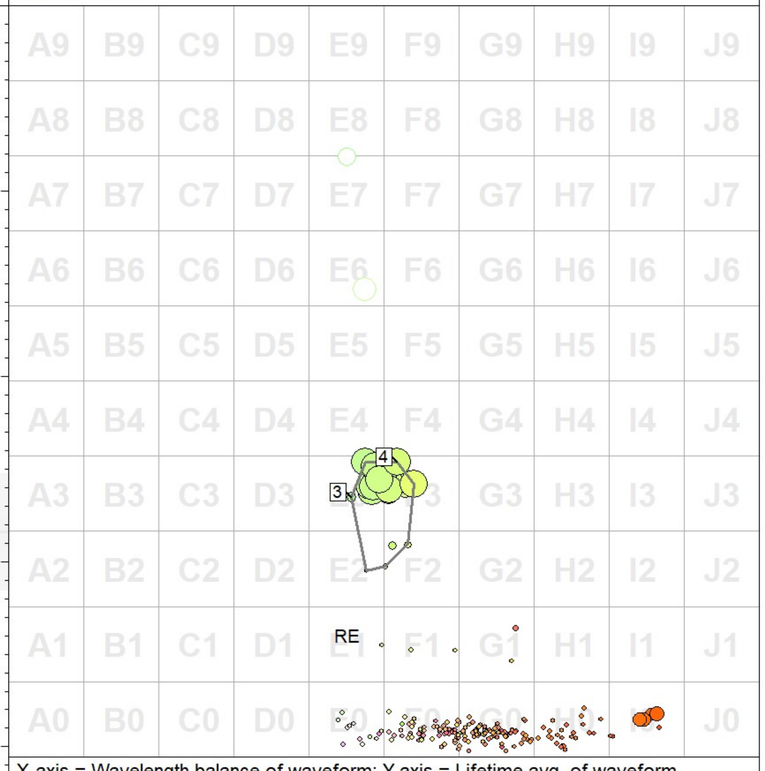
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Log: **UVHP-13**

Site: **PES Complex**	Date & Time: **2022-07-13 12:44 EDT**
Client: **Stantec**	Job:
Final Depth: **21.45 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **221.6 %RE @ 11.57 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





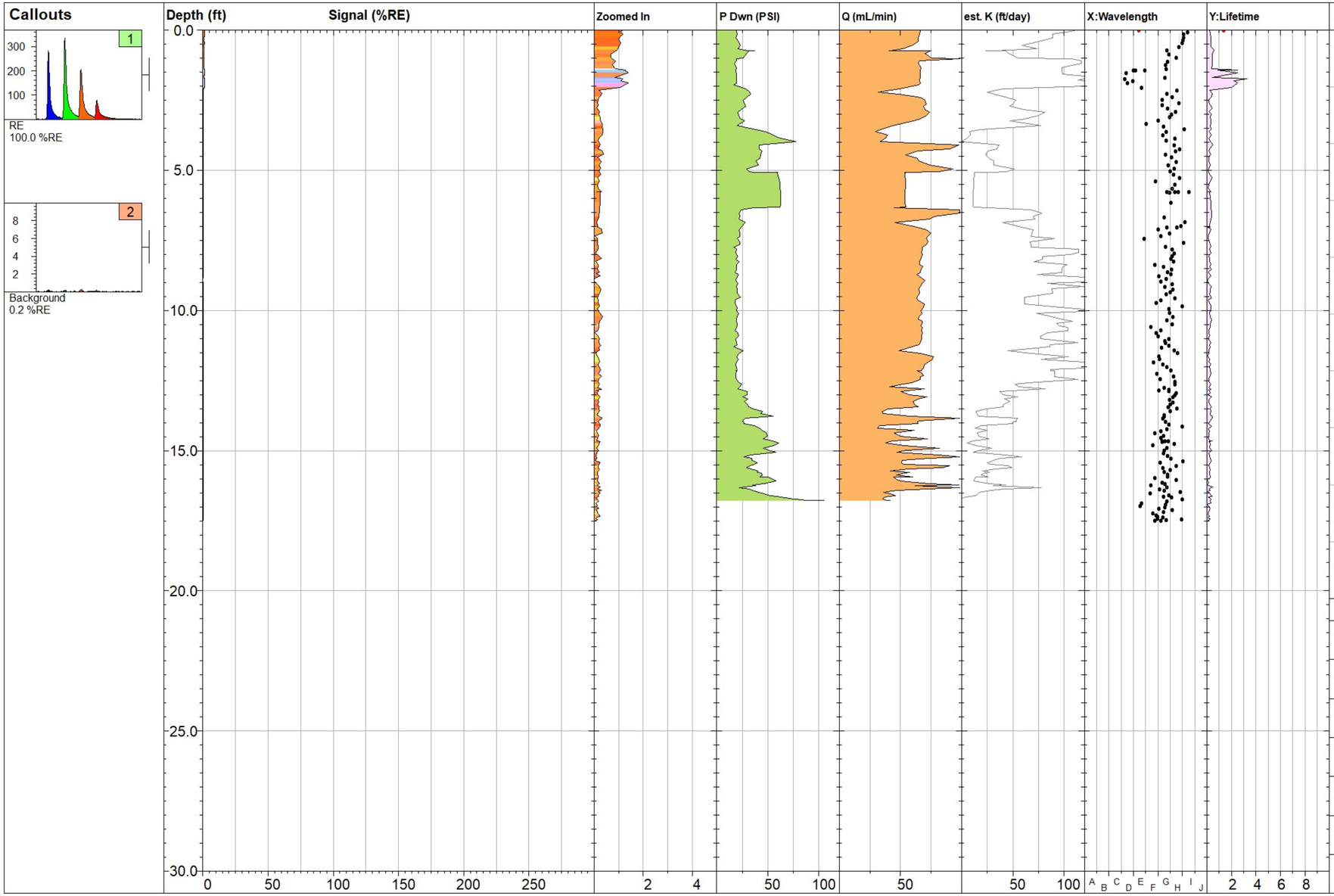
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

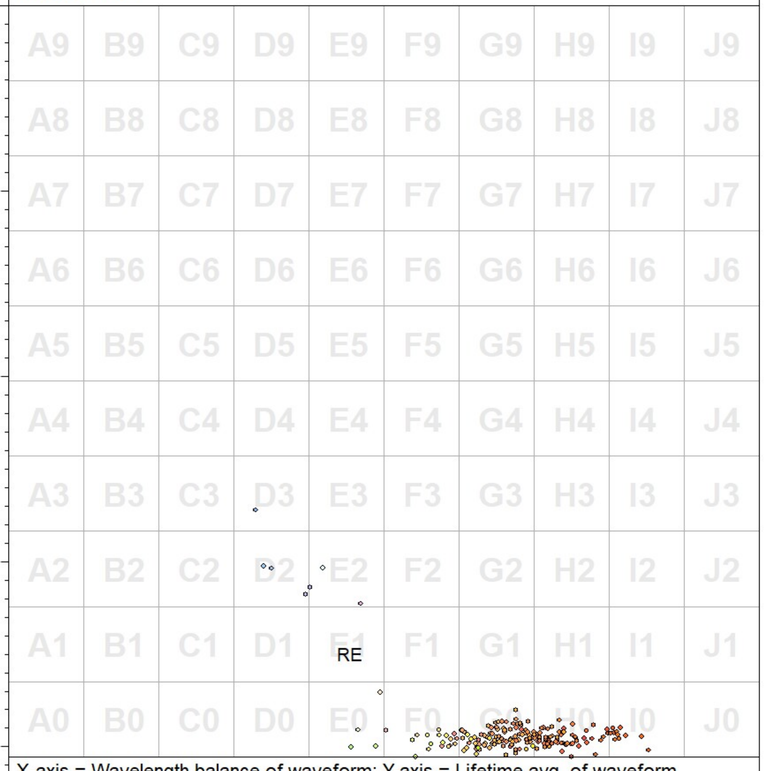
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Log: **UVHP-14**

Site: **PES Complex**	Date & Time: **2022-07-13 13:22 EDT**
Client: **Stantec**	Job:
Final Depth: **21.81 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **165.5 %RE @ 14.20 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

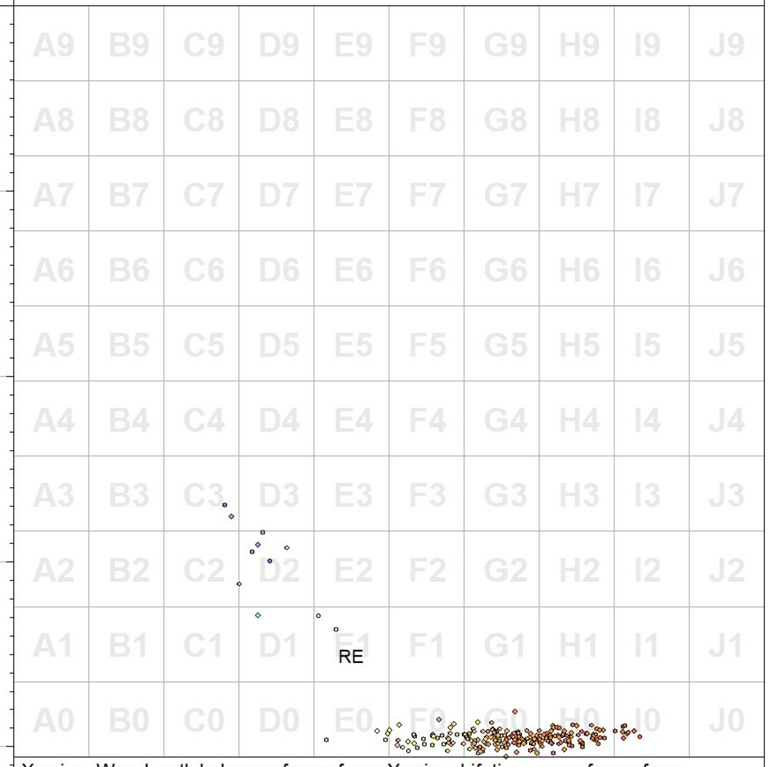
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Log: **UVHP-15**

Site: **PES Complex**	Date & Time: **2022-07-14 10:00 EDT**
Client: **Stantec**	Job:
Final Depth: **17.48 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **1.4 %RE @ 1.88 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





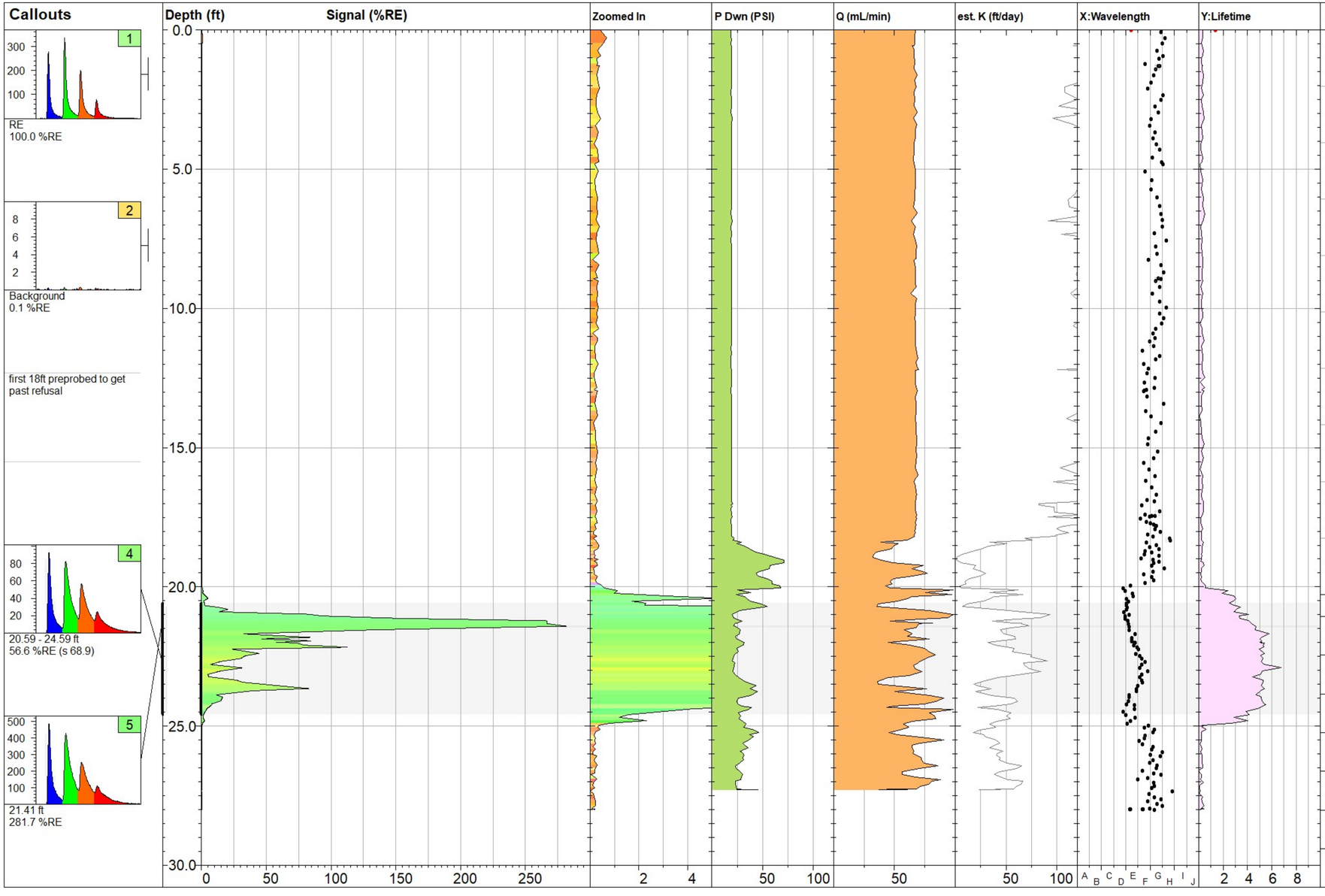
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

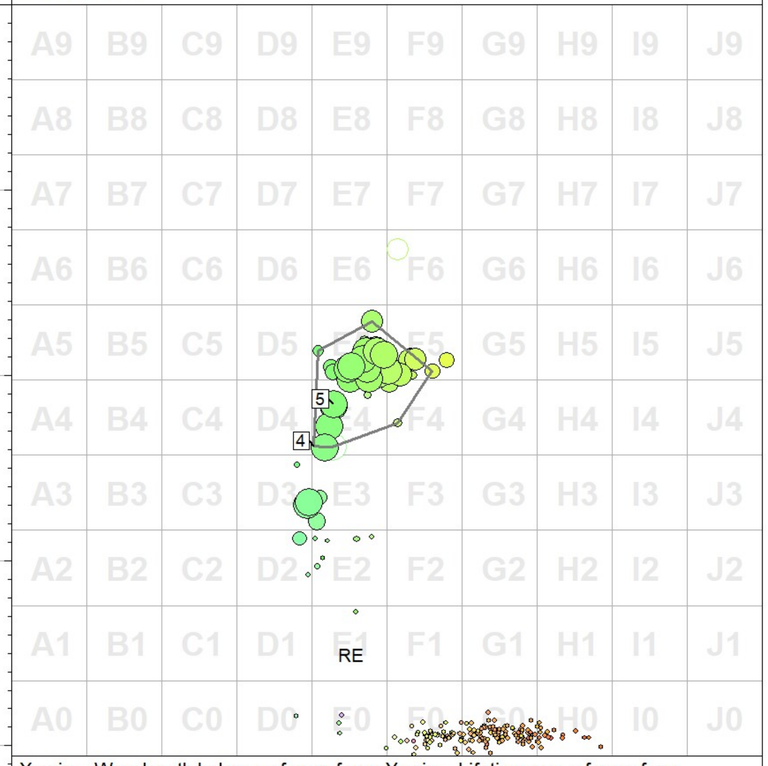
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Log: **UVHP-15b**

Site: **PES Complex**	Date & Time: **2022-07-14 10:29 EDT**
Client: **Stantec**	Job:
Final Depth: **17.52 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **1.8 %RE @ 1.90 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





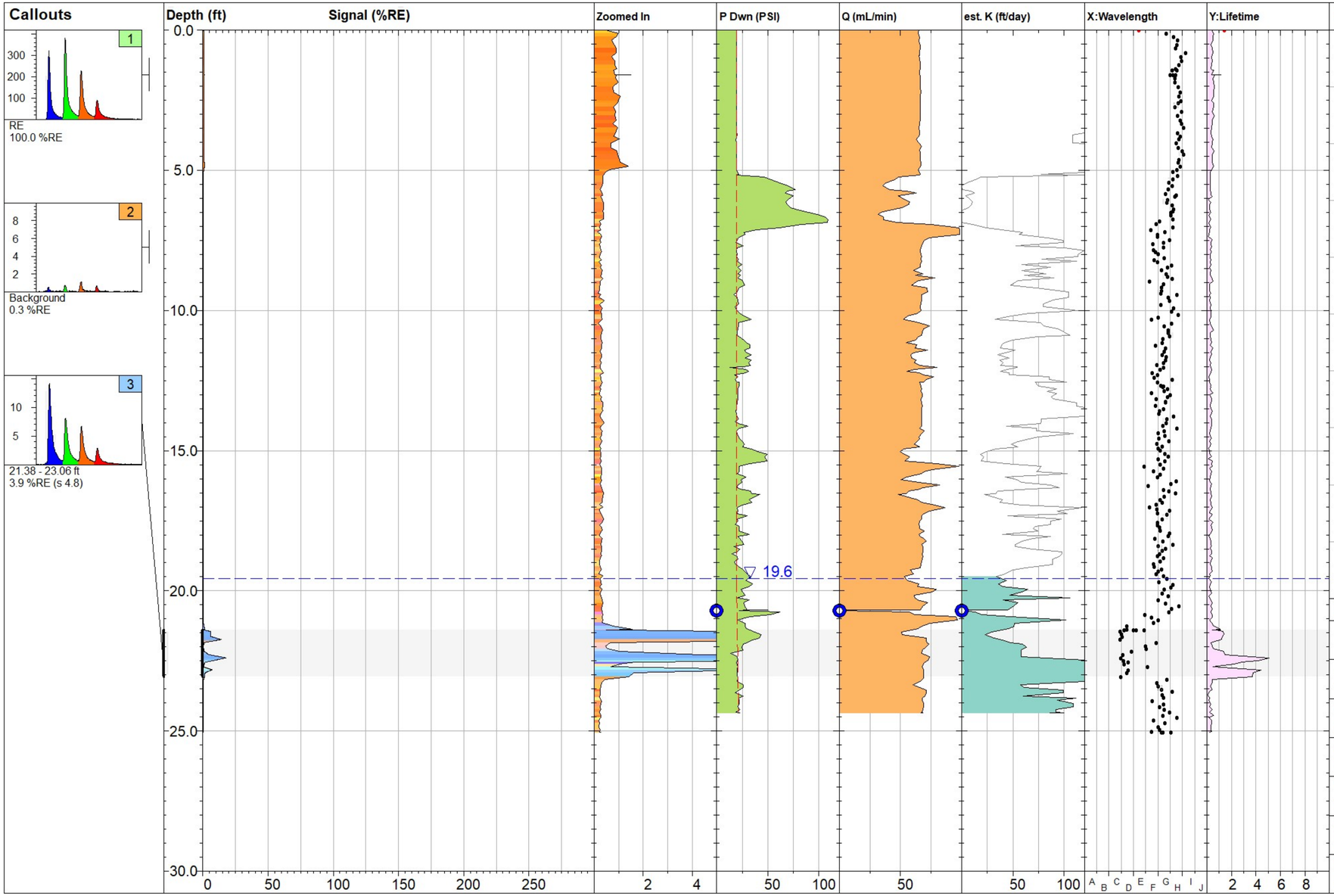
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

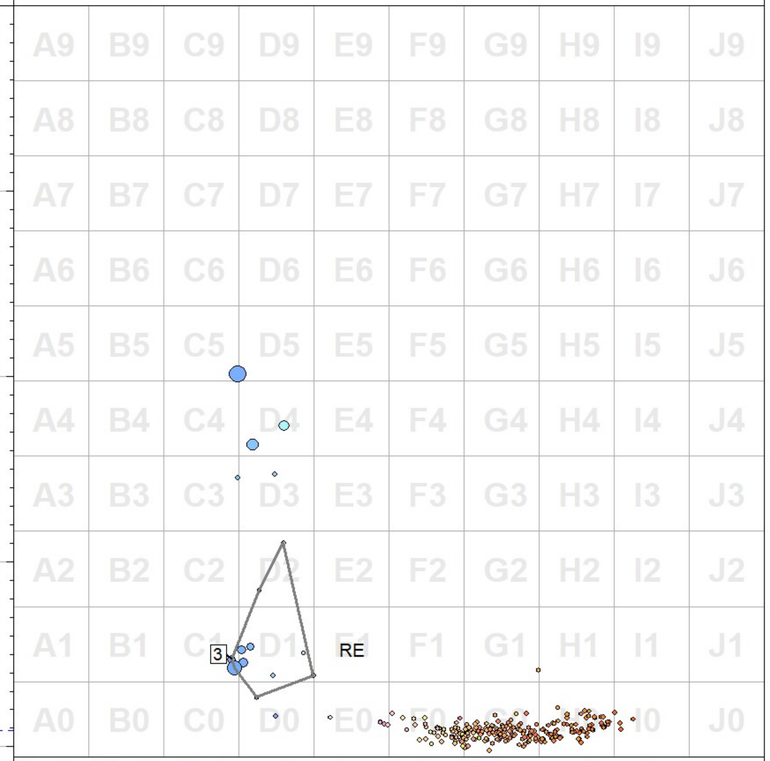
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Log: **UVHP-15c**

Site: **PES Complex**	Date & Time: **2022-07-14 11:09 EDT**
Client: **Stantec**	Job:
Final Depth: **27.99 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **281.7 %RE @ 21.41 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





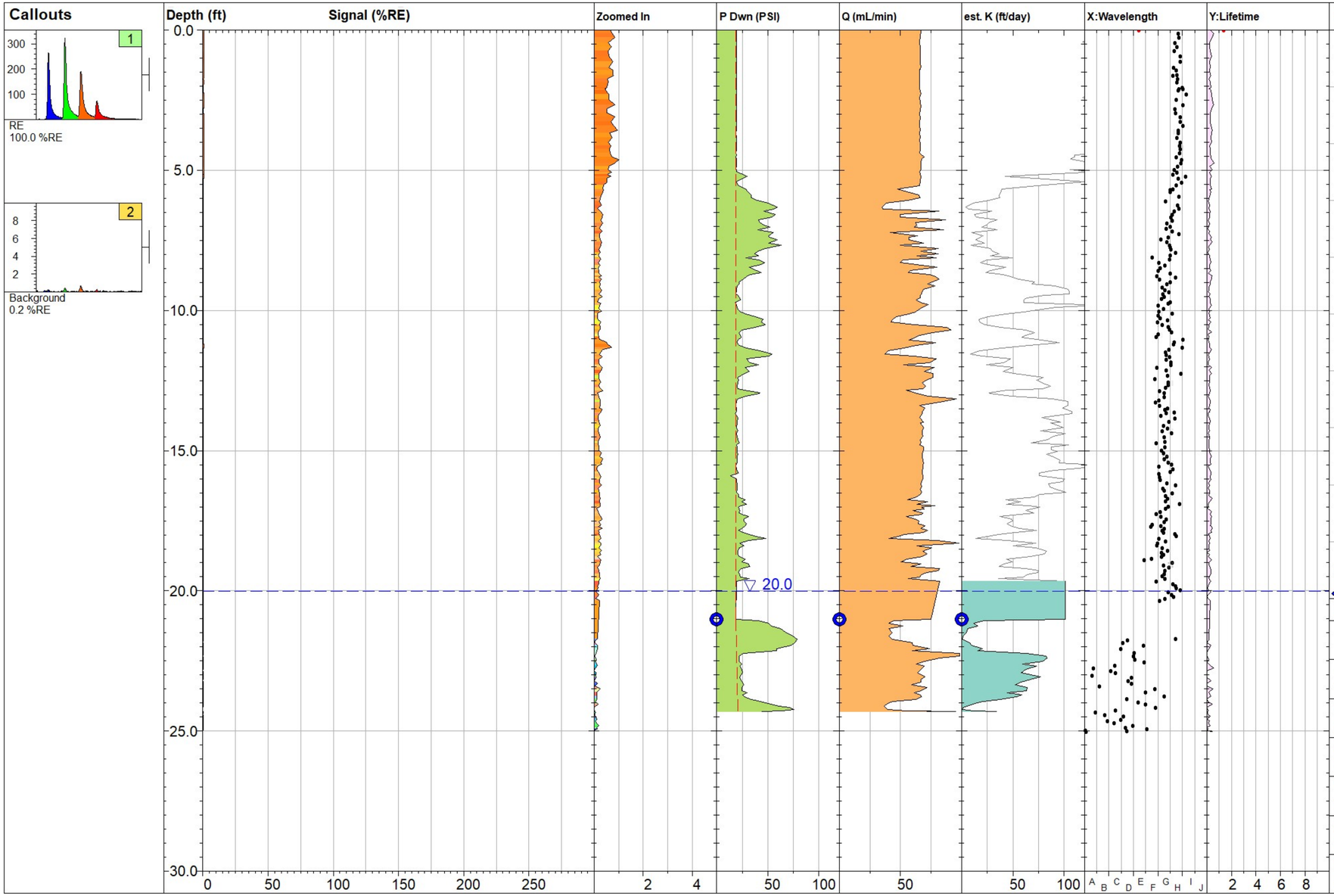
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

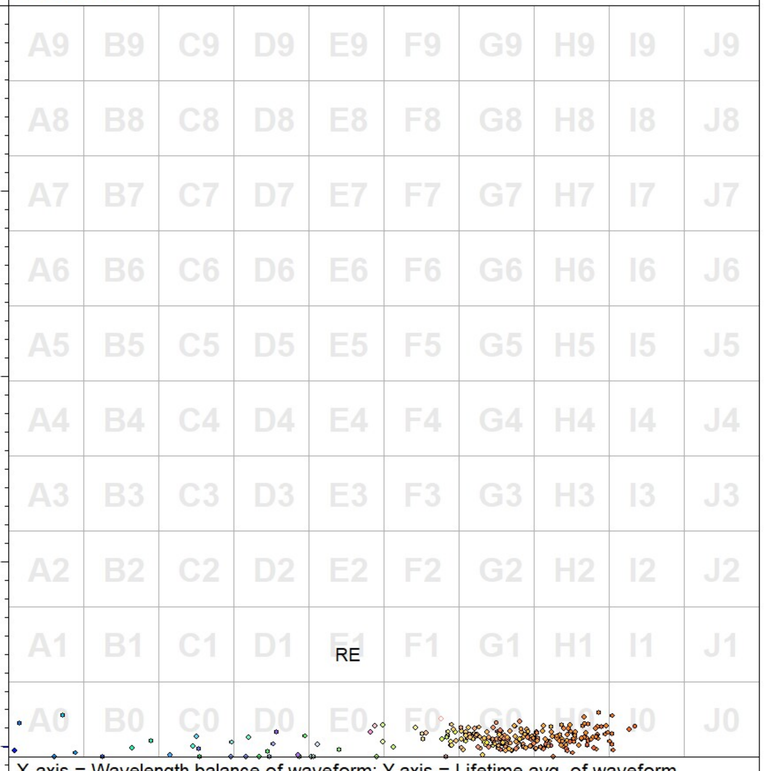
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Log: **UVHP-16**

Site: **PES Complex**	Date & Time: **2022-07-14 16:23 EDT**
Client: **Stantec**	Job:
Final Depth: **25.05 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **17.7 %RE @ 22.39 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





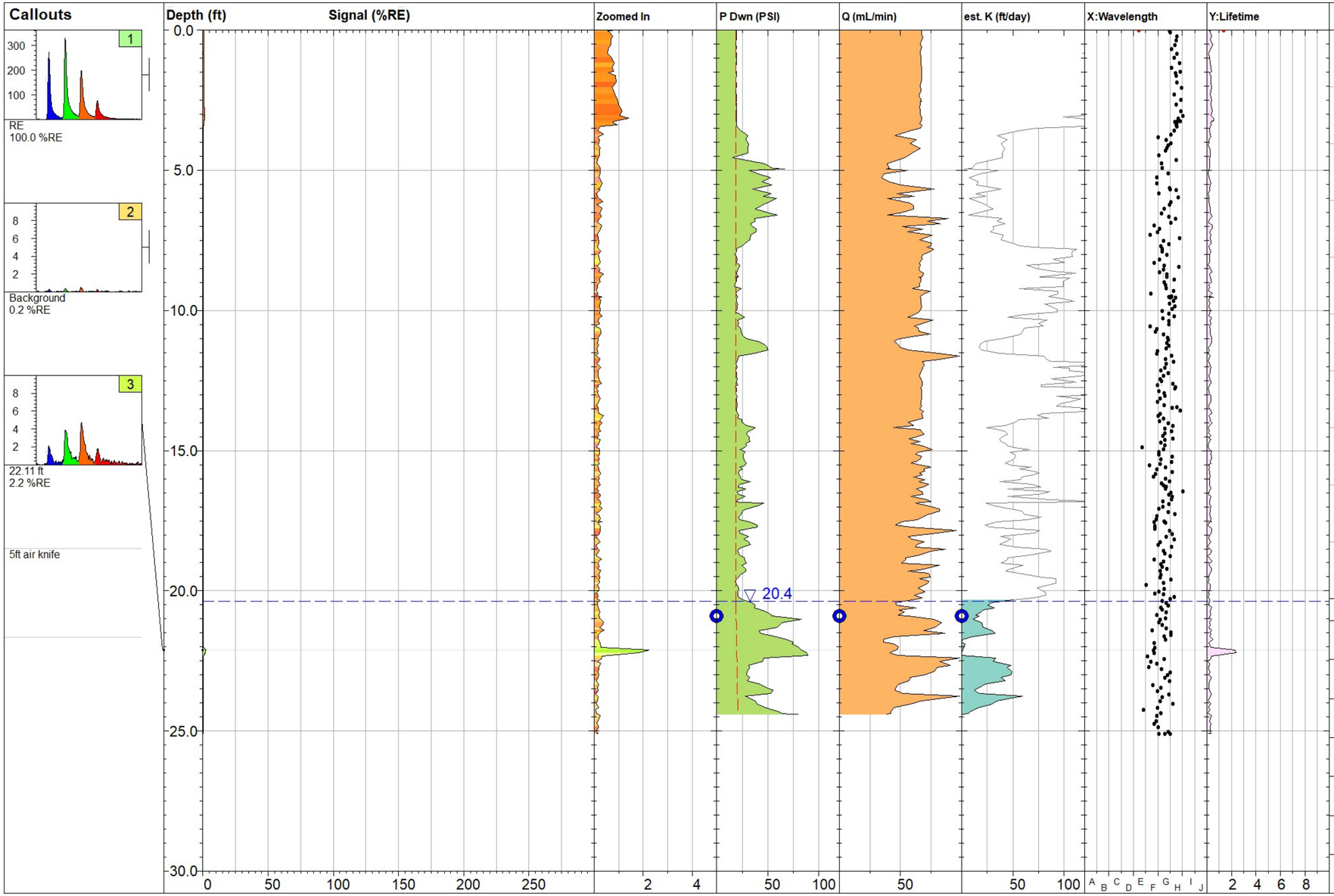
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

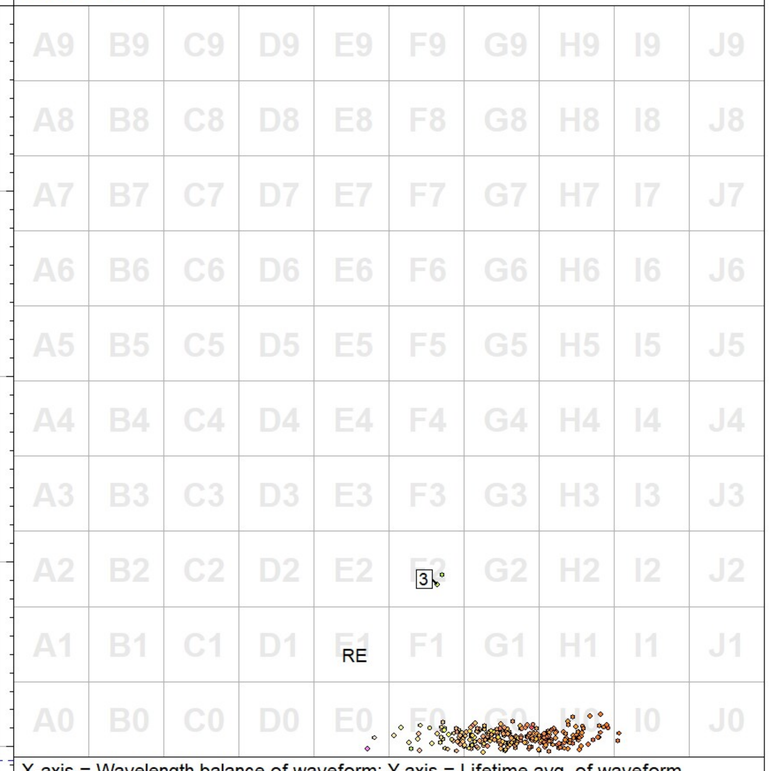
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Log: **UVHP-17**

Site: **PES Complex**	Date & Time: **2022-07-14 15:09 EDT**
Client: **Stantec**	Job:
Final Depth: **25.01 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **1.0 %RE @ 4.62 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





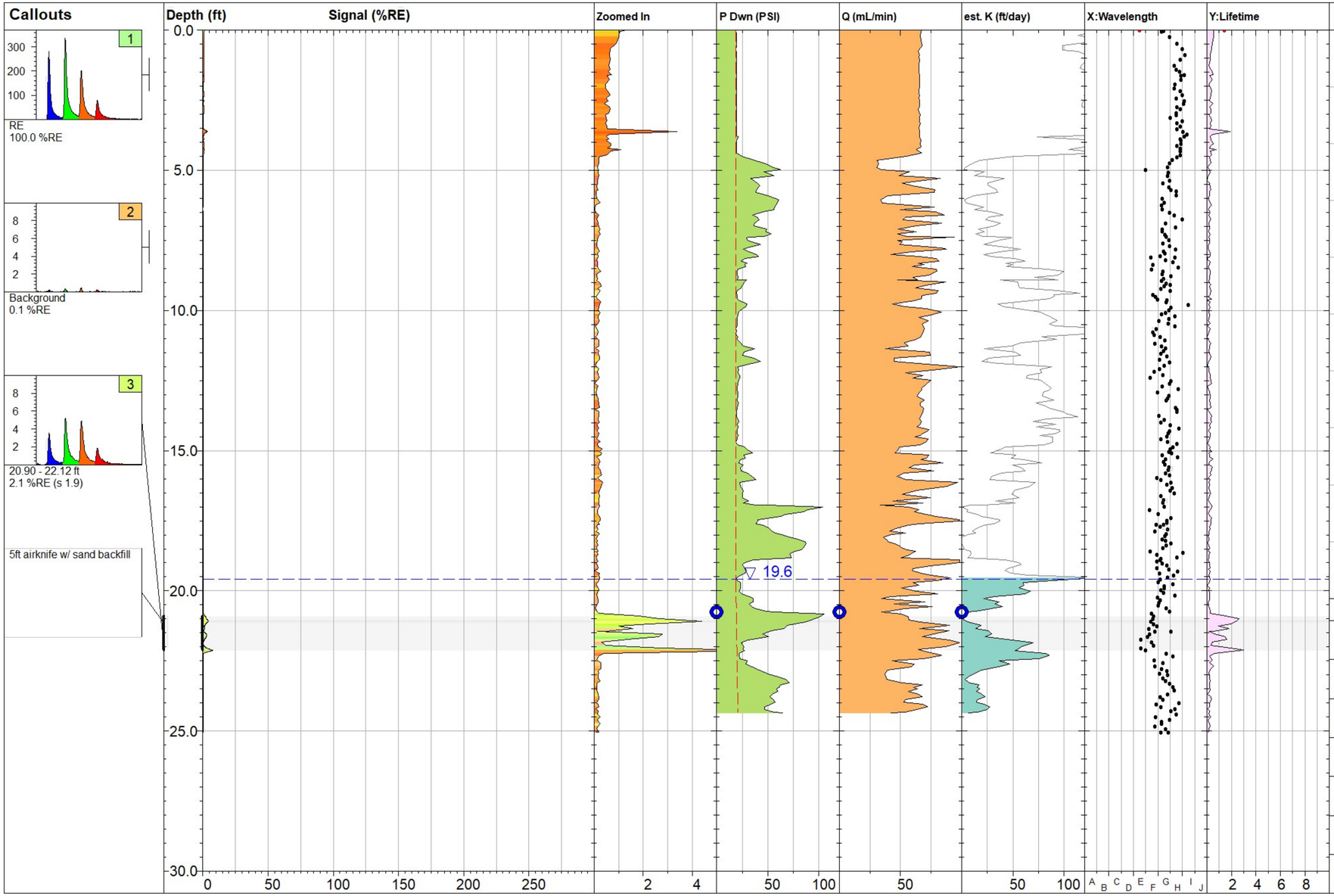
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

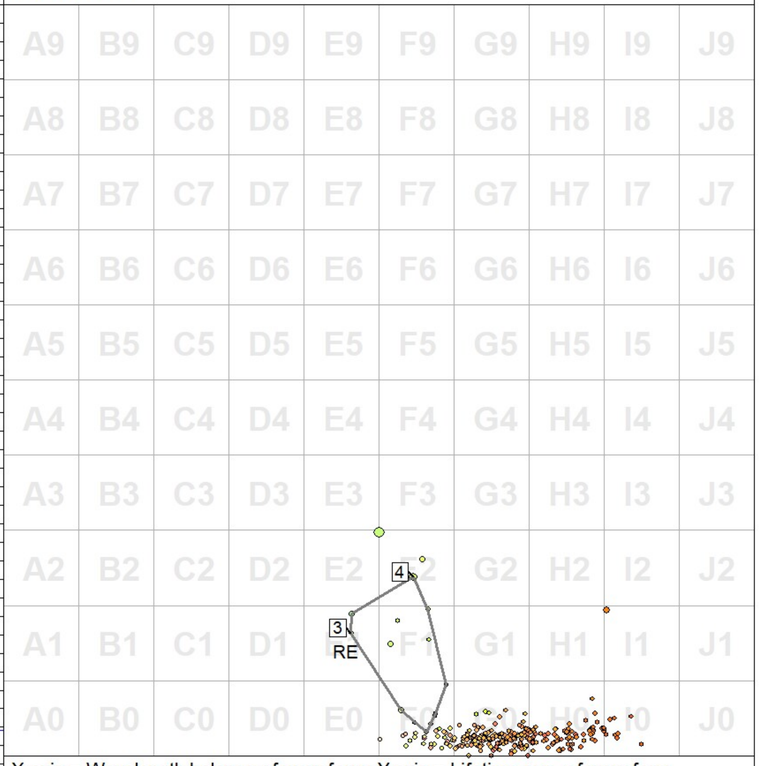
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Log: **UVHP-18**

Site: **PES Complex**	Date & Time: **2022-07-14 14:33 EDT**
Client: **Stantec**	Job:
Final Depth: **25.10 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **2.2 %RE @ 22.11 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





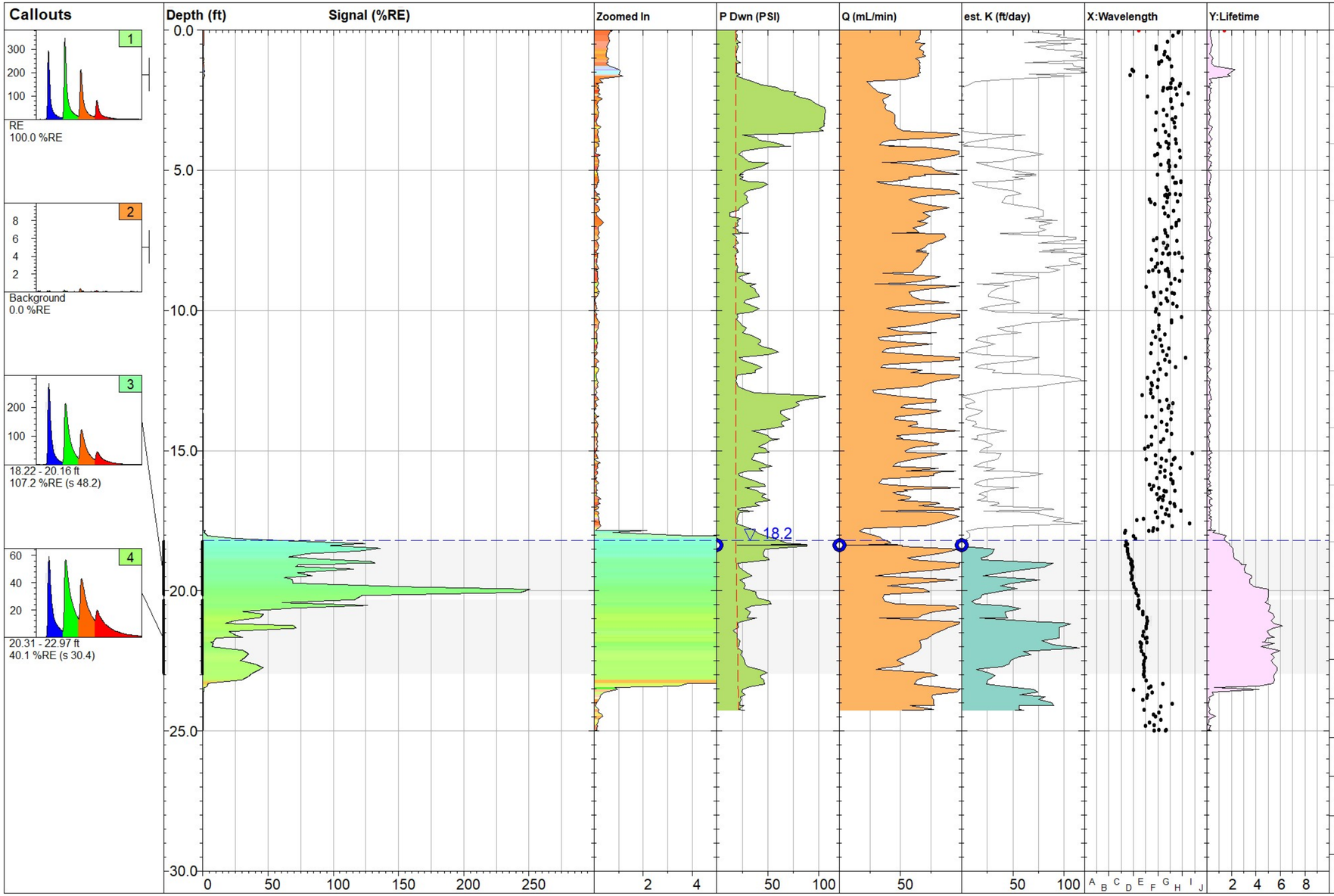
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

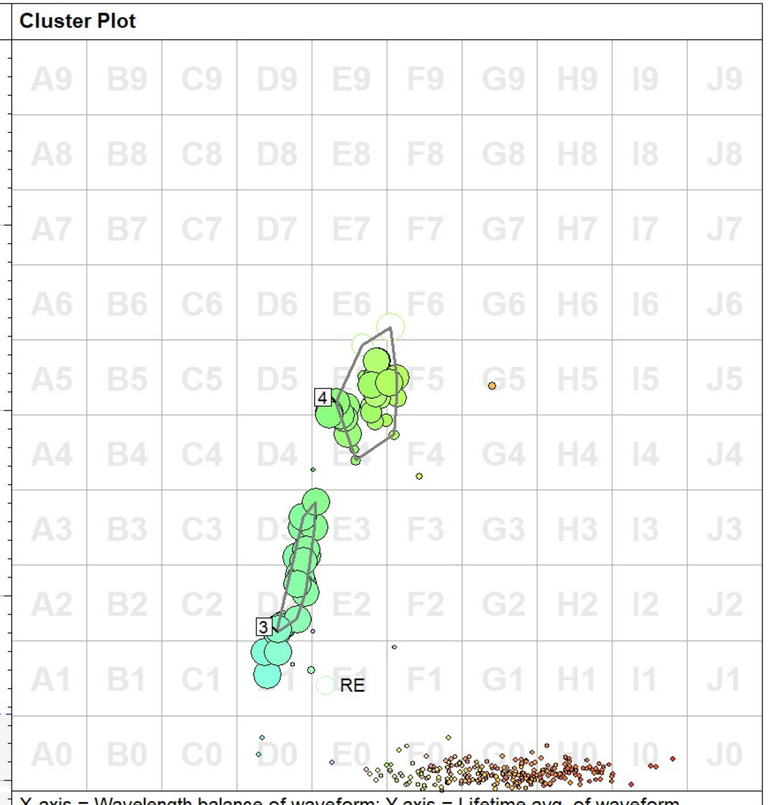
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Log: **UVHP-19**

Site: **PES Complex**	Date & Time: **2022-07-14 13:58 EDT**
Client: **Stantec**	Job:
Final Depth: **25.05 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **7.5 %RE @ 22.12 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





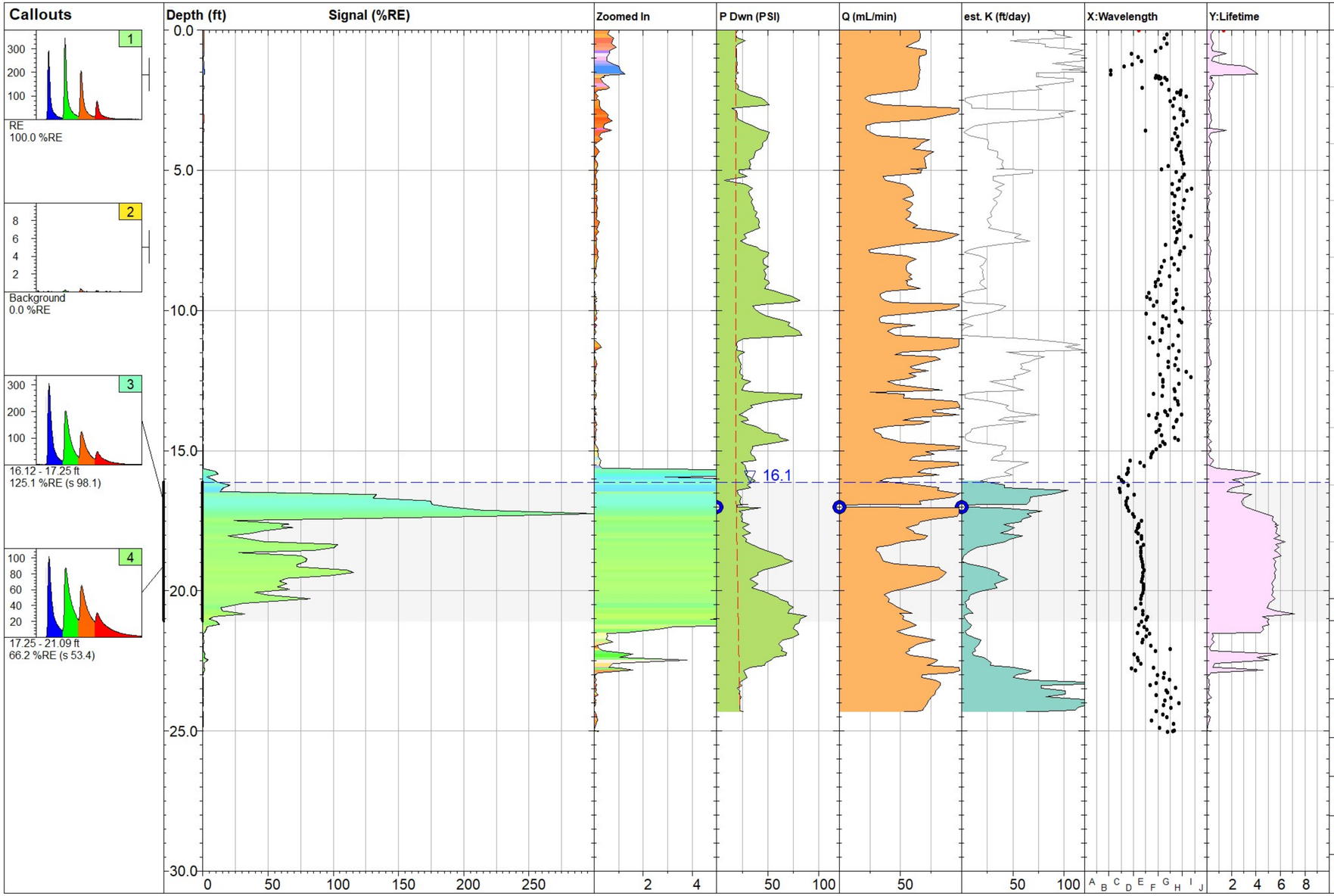
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

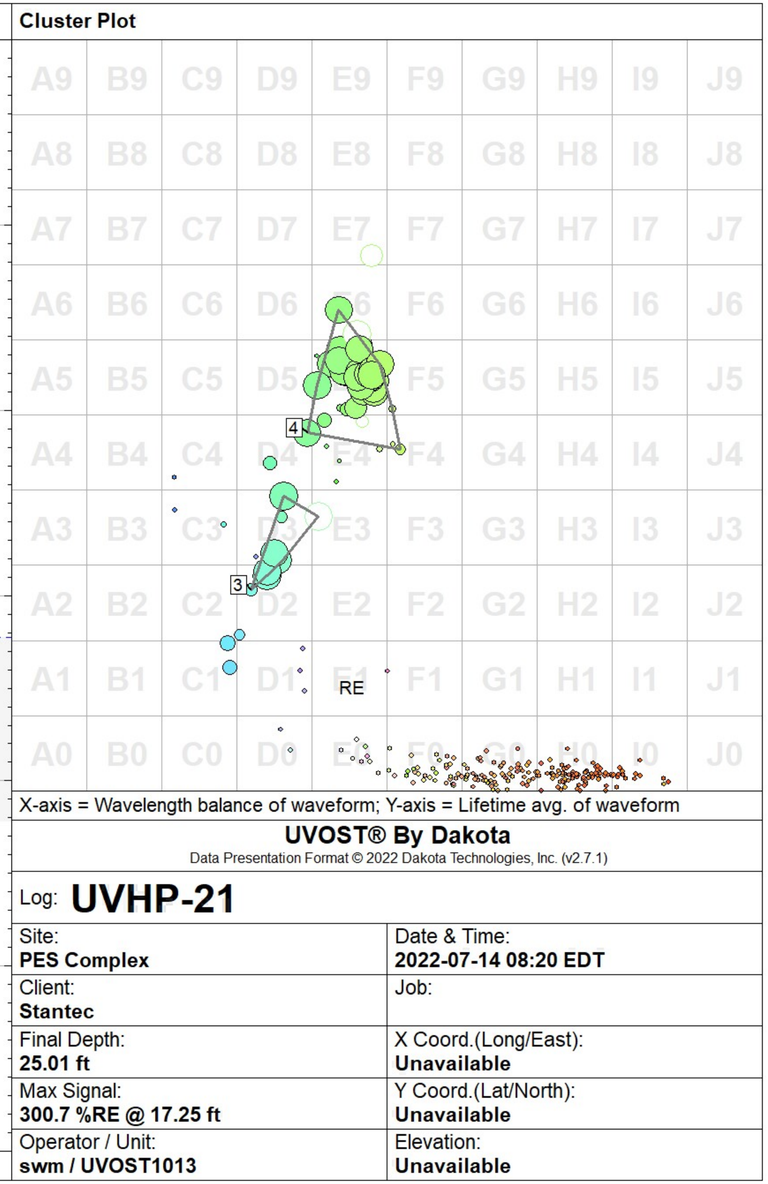
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Log: **UVHP-20**

Site: **PES Complex**	Date & Time: **2022-07-14 09:05 EDT**
Client: **Stantec**	Job:
Final Depth: **24.97 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **250.8 %RE @ 19.94 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





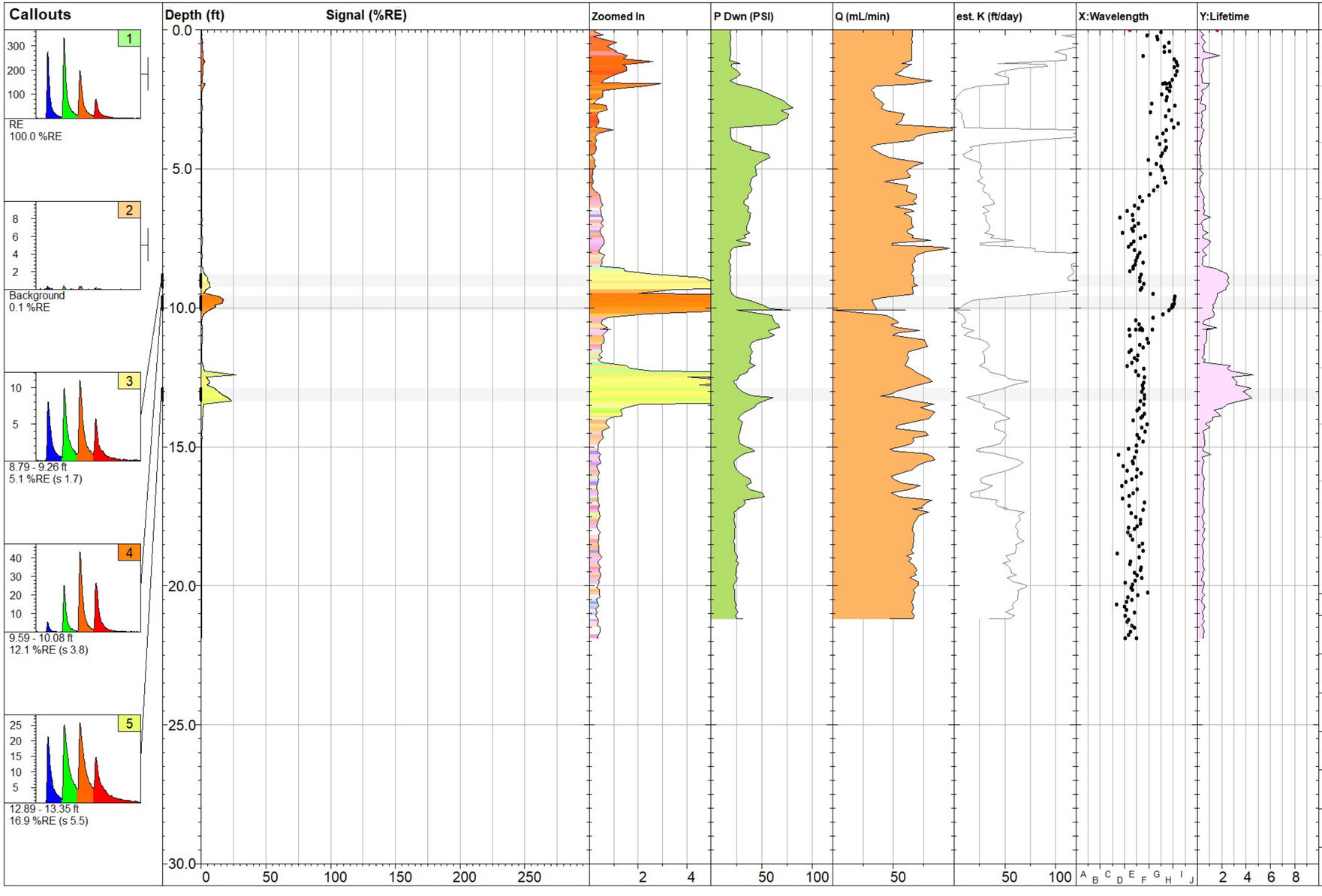
X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

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Log: **UVHP-21**

Site: **PES Complex**	Date & Time: **2022-07-14 08:20 EDT**
Client: **Stantec**	Job:
Final Depth: **25.01 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **300.7 %RE @ 17.25 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**



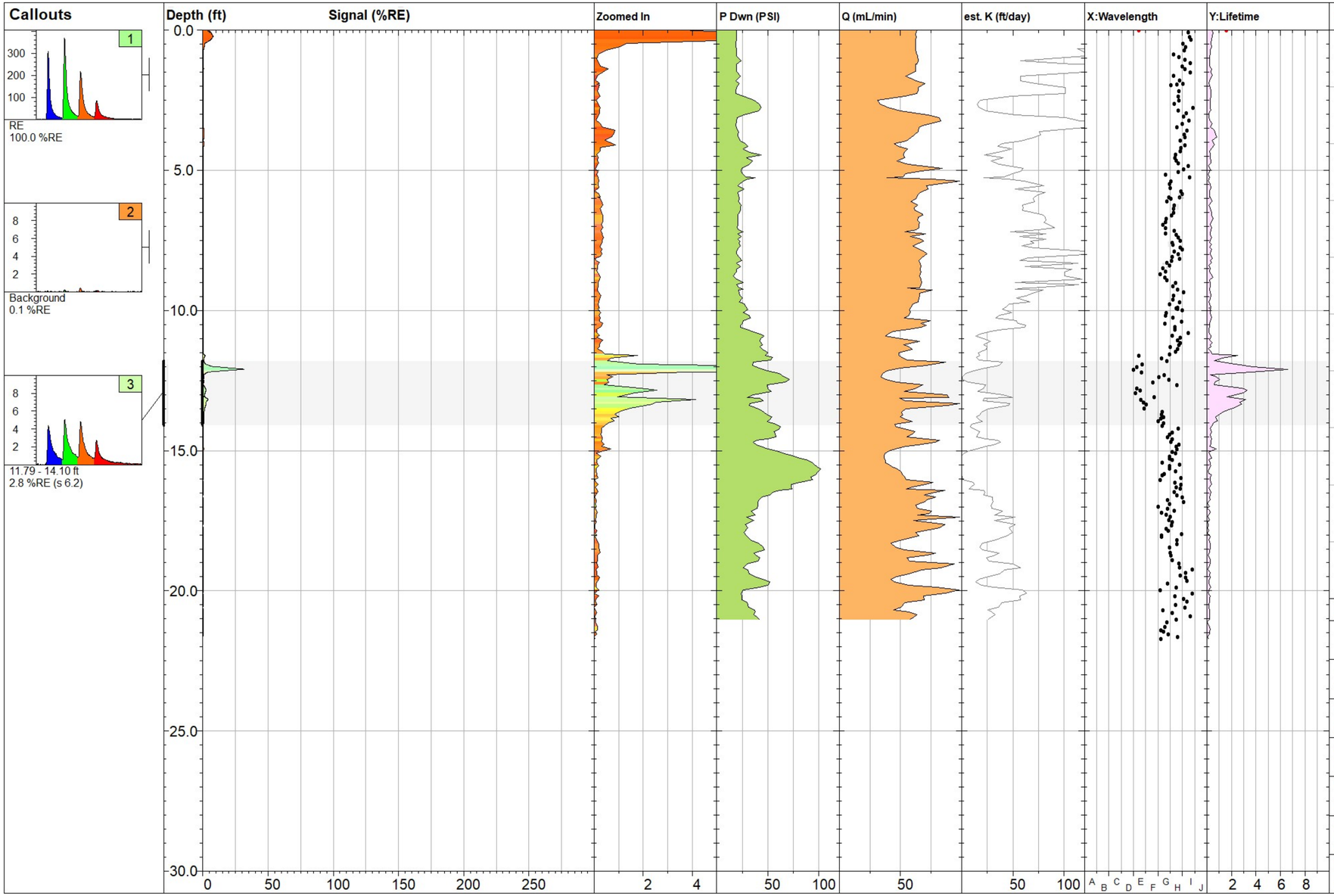


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Log: **UVHP-22**

Site: **PES Complex**	Date & Time: **2022-07-13 13:57 EDT**
Client: **Stantec**	Job:
Final Depth: **21.88 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **26.9 %RE @ 12.41 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

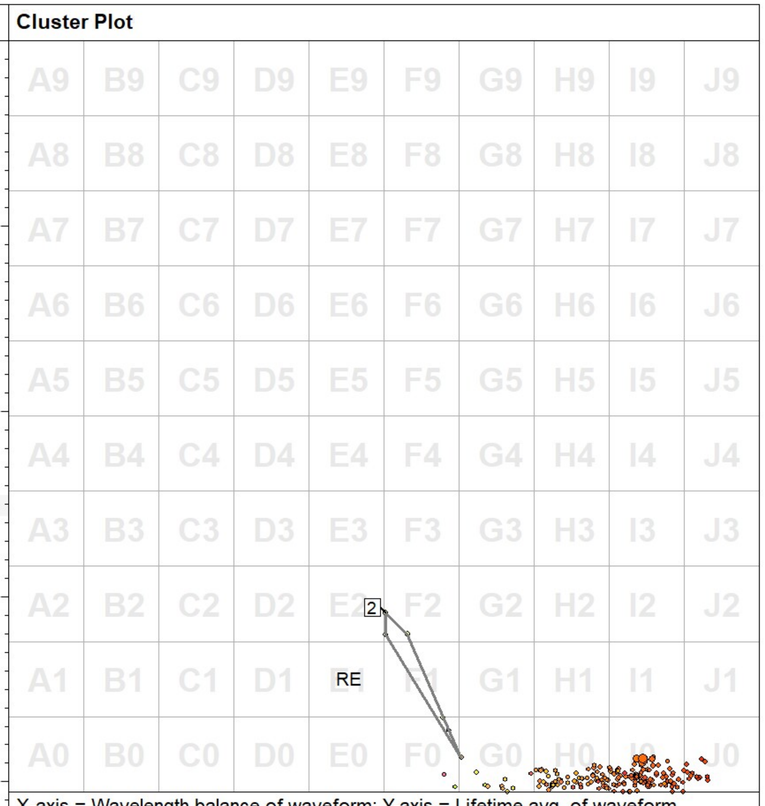
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Log: **UVHP-23**

Site: **PES Complex**	Date & Time: **2022-07-13 14:46 EDT**
Client: **Stantec**	Job:
Final Depth: **21.70 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **31.8 %RE @ 12.09 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**





X-axis = Wavelength balance of waveform; Y-axis = Lifetime avg. of waveform

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Log: **UVHP-24**

Site: **PES Complex**	Date & Time: **2022-07-14 07:34 EDT**
Client: **Stantec**	Job:
Final Depth: **17.91 ft**	X Coord.(Long/East): **Unavailable**
Max Signal: **5.7 %RE @ 0.21 ft**	Y Coord.(Lat/North): **Unavailable**
Operator / Unit: **swm / UVOST1013**	Elevation: **Unavailable**

Appendix C

UVOST® Reference Log

DAKOTA TECHNOLOGIES

Dakota Technologies
UVOST®-HP Reference Log

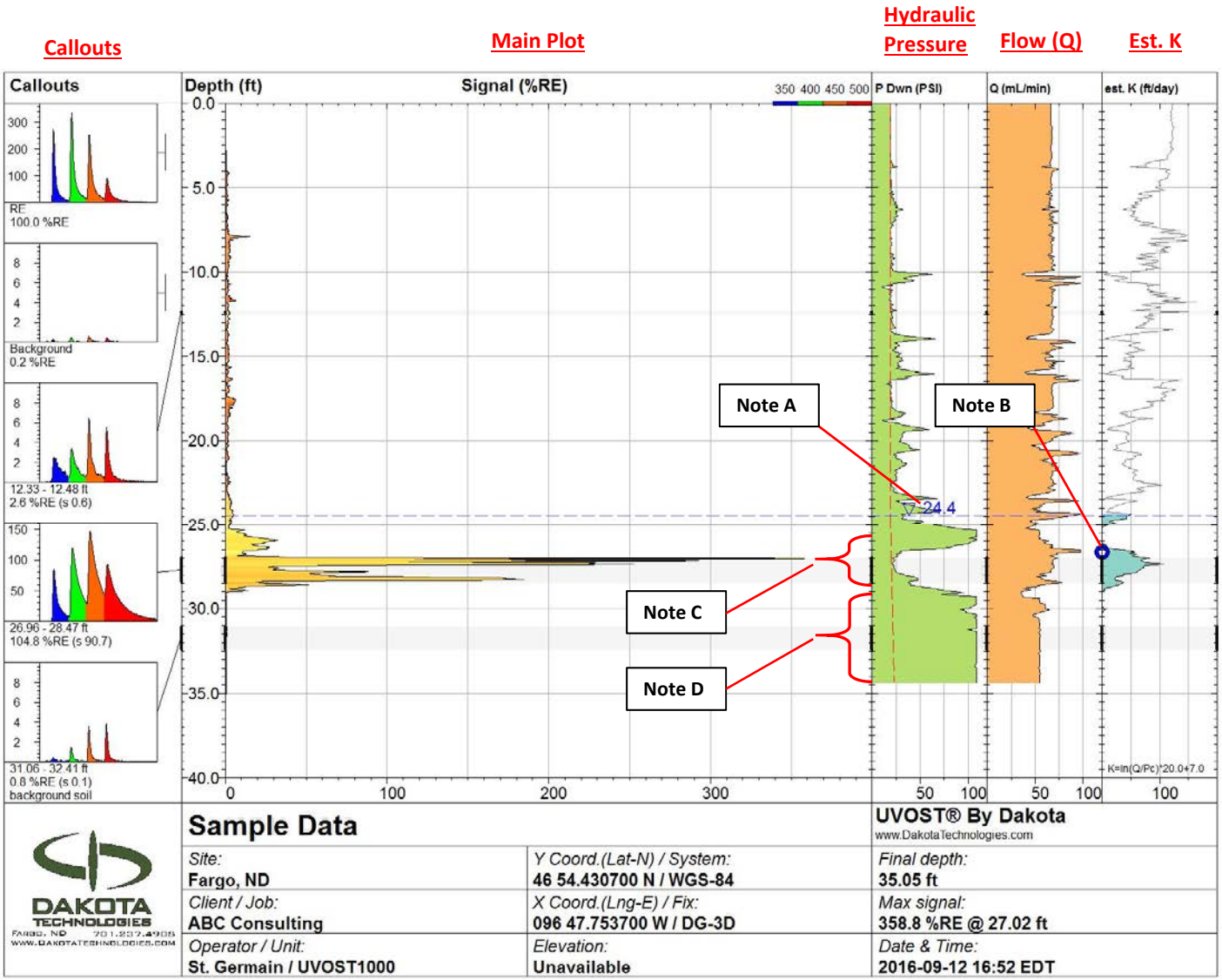
Callouts: Waveforms from selected depths or depth ranges showing the multi-wavelength waveform for that depth. The four peaks are due to fluorescence at four wavelengths and referred to as “channels”. Each channel is assigned a color. Various NAPLs will have a unique waveform “fingerprint” due to the relative amplitude of the four channels and/or broadening of one or more channels. Basic waveform statistics and any operator notes are given below the callout.

Main Plot: Signal (total fluorescence) versus depth where signal is relative to the Reference Emitter (RE). The total area of the waveform is divided by the total area of the Reference Emitter yielding the %RE. This %RE scales with the NAPL fluorescence. The fill color is based on the relative distribution of each channel’s area to the total waveform area (see callout waveform). The channel-to-color relationship and corresponding wavelengths are given in the upper right corner of the plot.

Hydraulic Pressure (P Dwn): Downhole hydraulic pressure is measured in response to pumping water into the formation at a constant rate. Measurements are logged simultaneously with UVOST data. The resulting log gives insight into the permeability of the soils.

Flow (Q): Water is pumped out of the port of the UVOST-HP probe at a constant rate of 60 mL/min. A change in flow (usually accompanied by an inverse pressure change) is an indicator of hydraulic properties of the soil.

Estimated K: The estimated hydraulic conductivity (K) is internally calculated by utilizing pressure and flow data in conjunction with dissipation test(s) performed at each location. The estimated K is calculated by the equation: K = ln(Q/P’)*20.0 + 7.0.



Note A: The water table has been calculated and plotted at 24.4’ bgs.

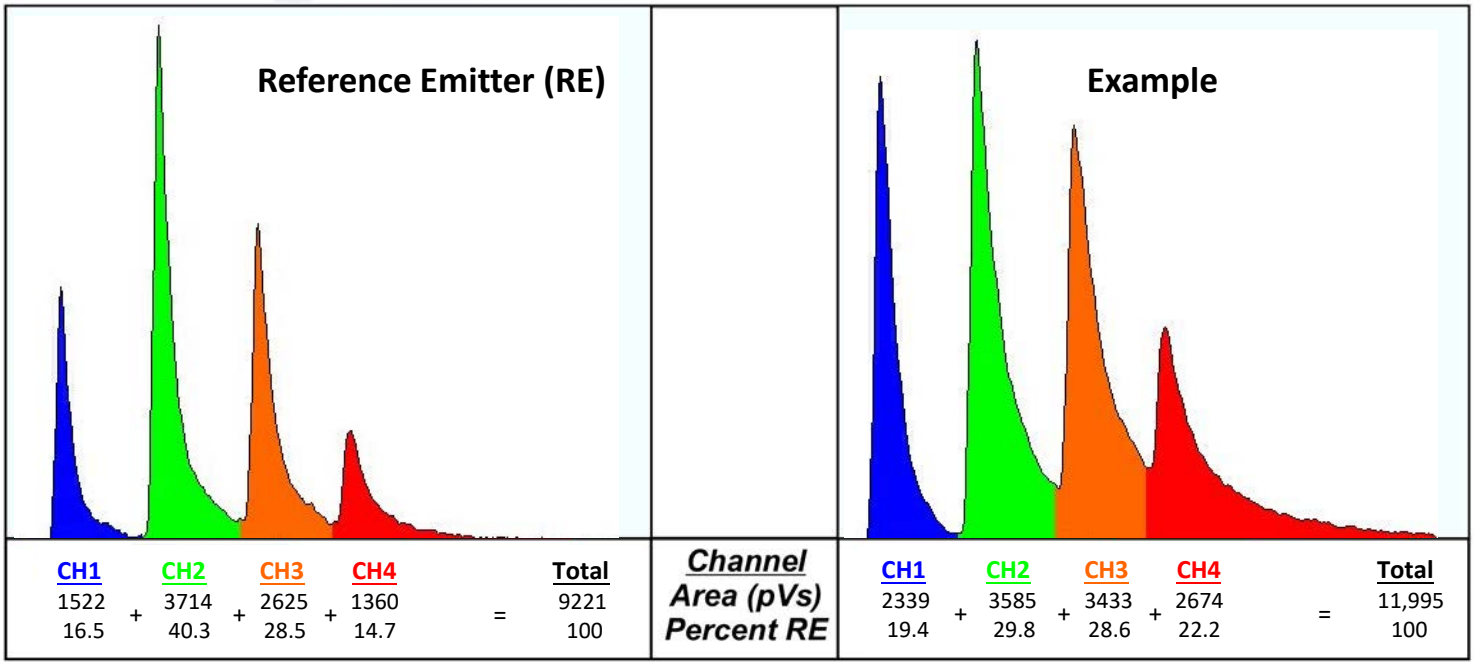
Note B: The circle on the Estimated K plot represents the location(s) of dissipation tests. Here, a single dissipation test was performed at 26.67 bgs’.

Note C: The highest LNAPL response in this log is present in an area of relatively higher permeability, as indicated by low pressure and higher estimated k values at approximately 26’ to 28’.

Note D: The increase in pressure starting near 29’ (transducer is maxed out, 100 psi) is due to low permeability conditions. In this example, the increase in pressure below the LNAPL represents a potential confining unit.

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UVOST® Reference Log

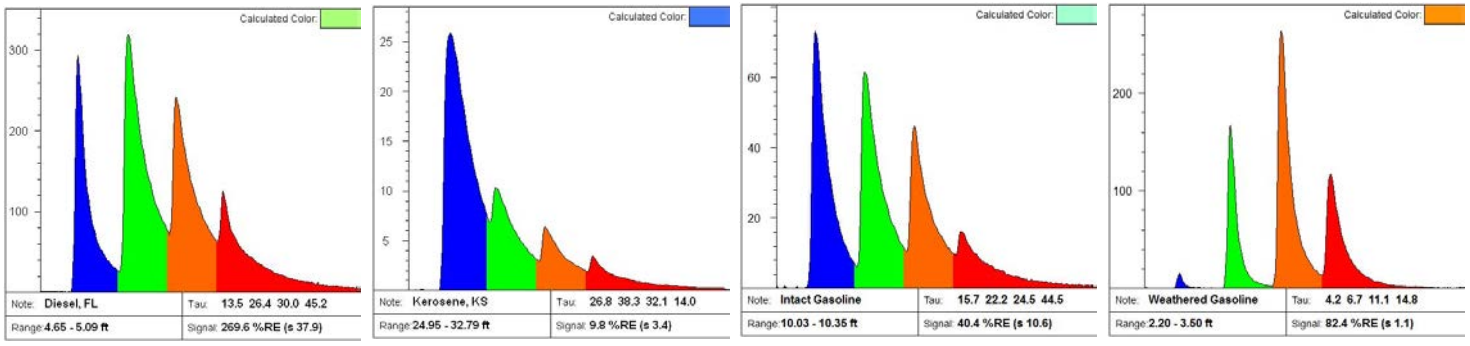
Waveform Signal Calculation



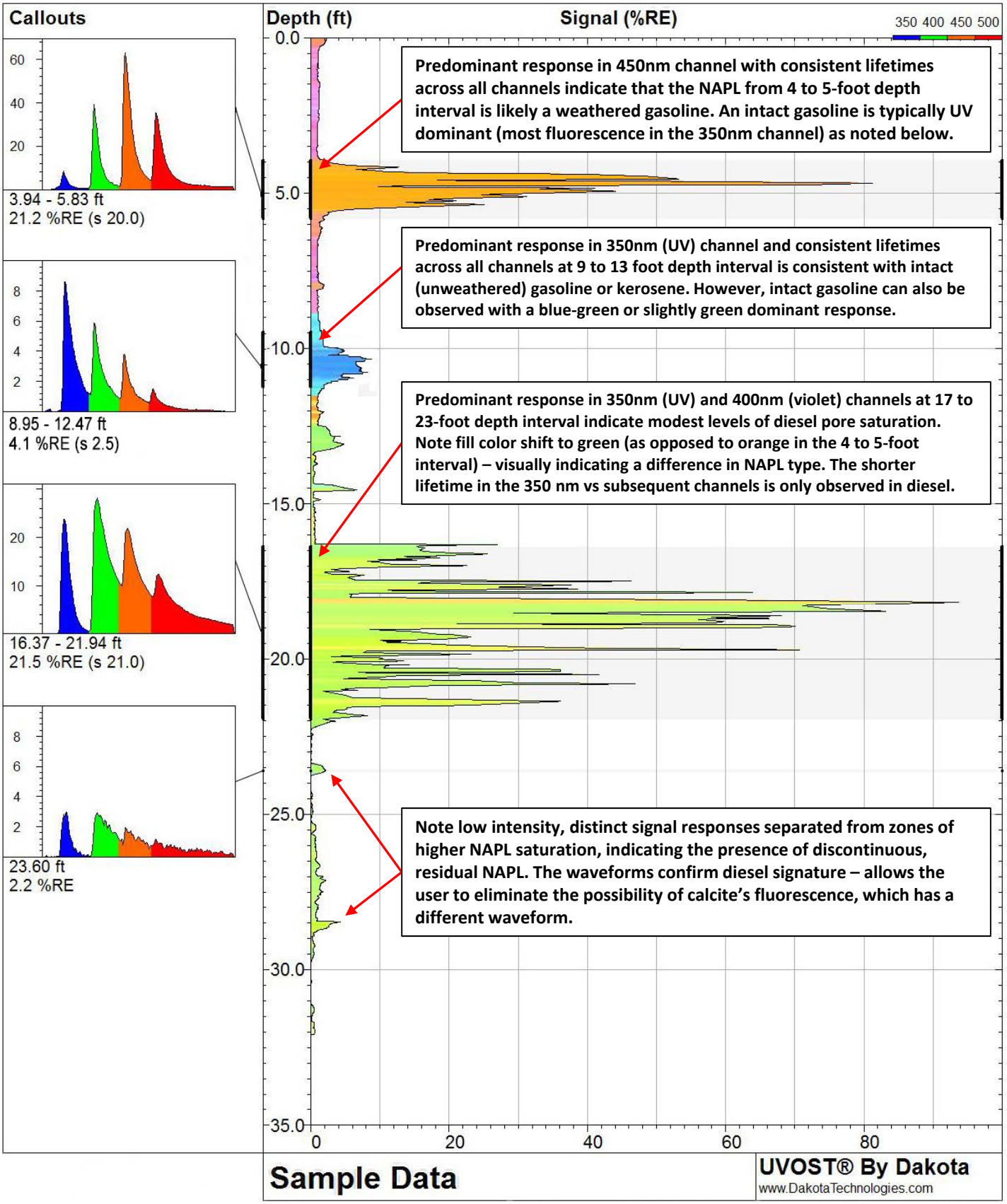
Data Files

***.lif.raw.bin**	Raw data file. Header is ASCII format and contains information stored when the file was initially written (e.g. date, total depth, max signal, GPS, etc., and any information entered by the operator). All Raw waveforms are appended to the bottom of the file in a binary format.
***.lif.plt**	Stores the plot scheme history (e.g. callout depths) for associated Raw file. Transfer along with the Raw file in order to recall previous plots.
***.lif.jpg**	A .jpg image of the OST log including the main signal vs. depth plot, callouts, information, etc.
***.lif.dat.txt**	Data export of a single Raw file. Tab delimited format. No string header is provided for the columns to make importing into some programs easier. Each row is a unique depth reading. The columns are: 1-Depth; 2-Total Signal (%RE); 3-CH1%; 4-Ch2%; 5-CH3%; 6-Ch4%; 7-Rate; 8-EC Depth; 9-EC Signal; 10-Hammer Rate Depth; 11-Hammer Rate; 12-Color (RRGGBB). Summing channels 1 to 4 yields the Total Signal.
***.lif.sum.txt**	A summary file for a number of Raw files. ASCII tab delimited format. The file contains a string header. The summary includes one row for each Raw file and contains information for each filed including: the file name, GPS coordinates, max depth, max signal, and depth at which the max signal occurred.
***.lif.log.txt**	An activity log generated automatically is located in the OST application directory in the 'log' subfolder. Each OST unit the computer operates will generate a separate log file per month. A log file contains much of the header information contained within each separate Raw file, including: data rate, total depth, max signal, etc.

Common Waveforms (highly dependent on soil, weathering, etc.)



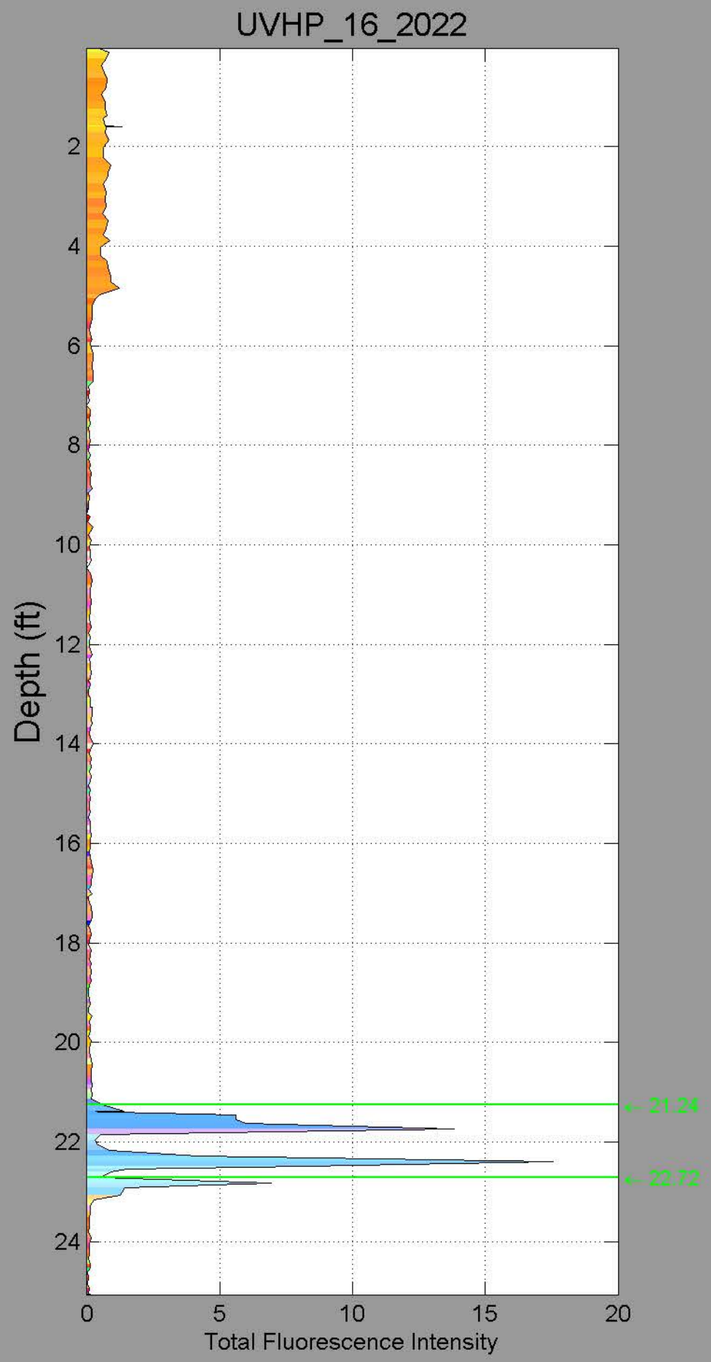
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UVOST® Reference Log



Appendix D

Advanced Analysis

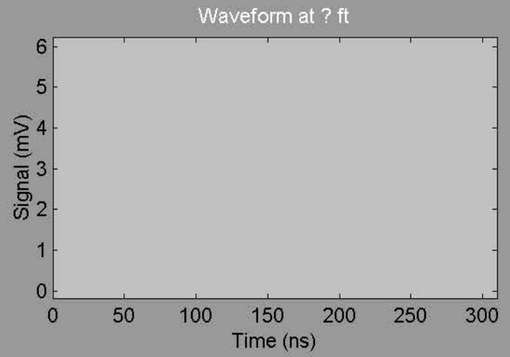
DAKOTA TECHNOLOGIES



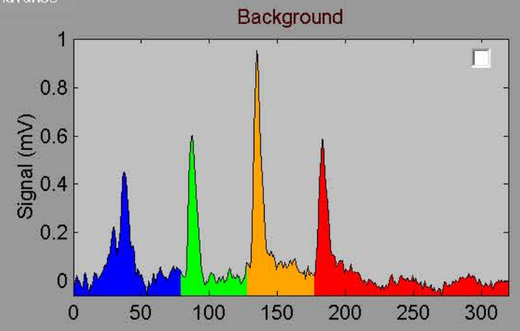
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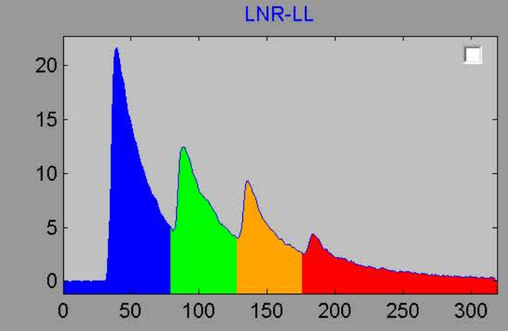
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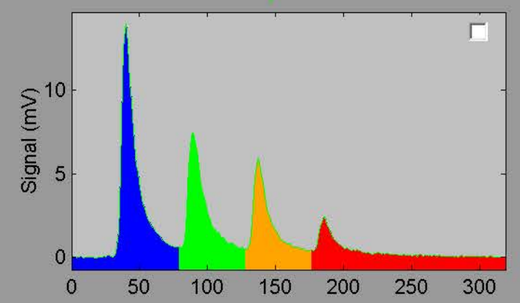
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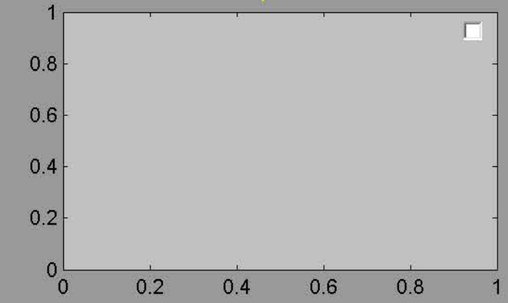


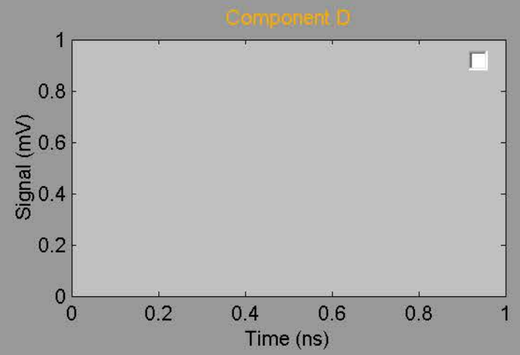


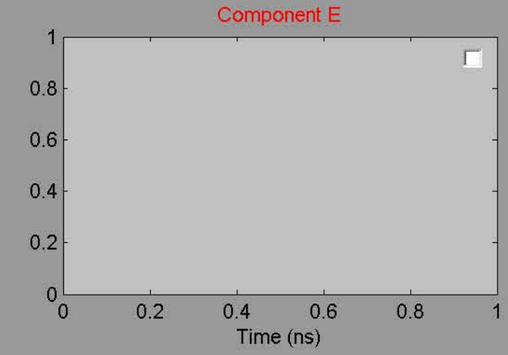




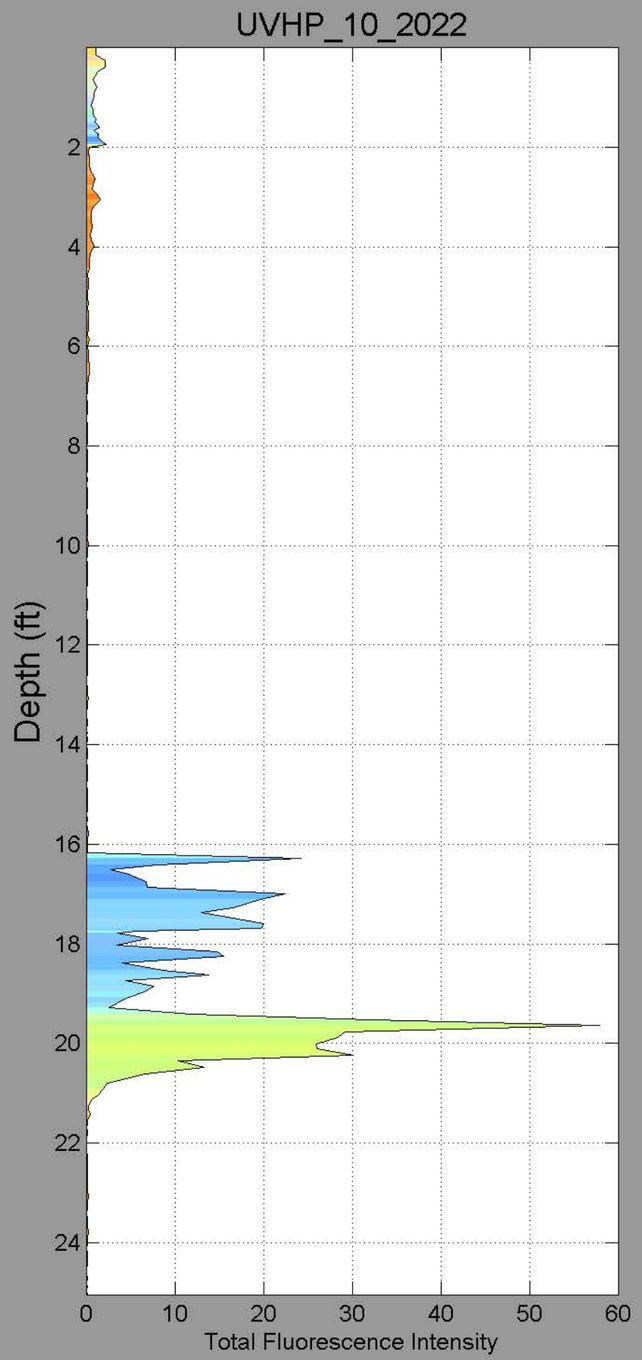




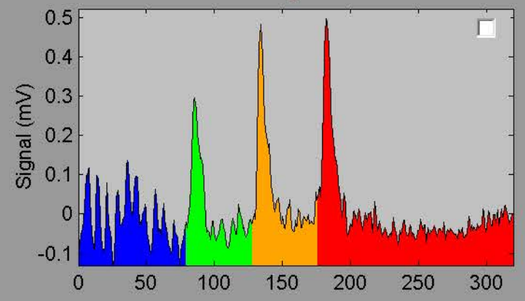


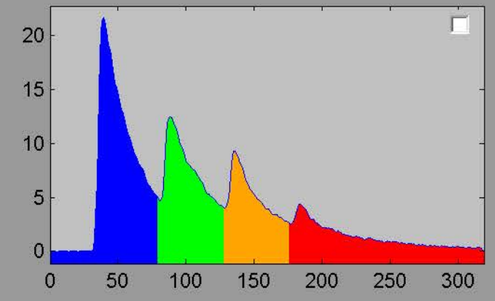


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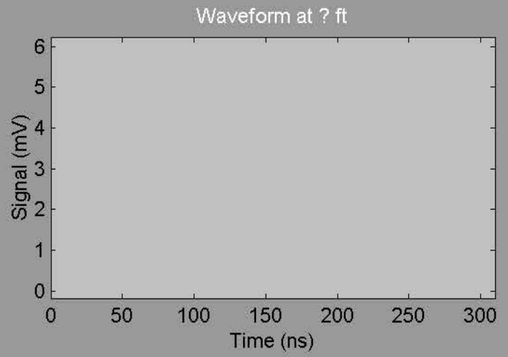


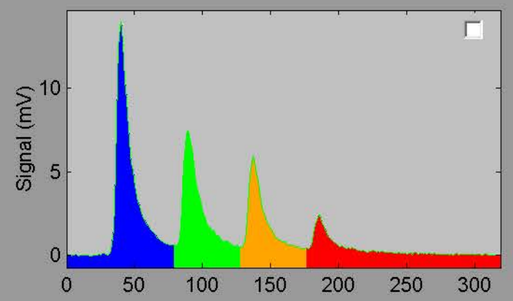
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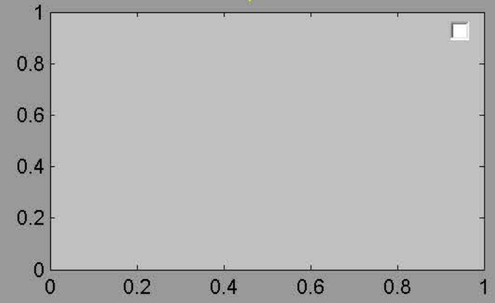




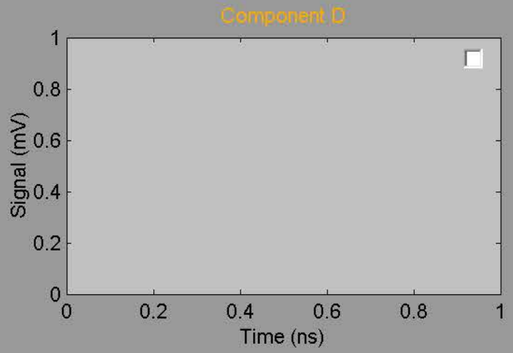
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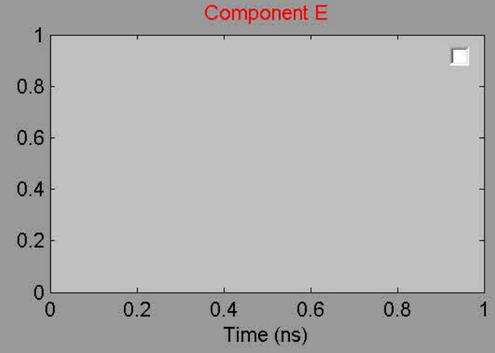




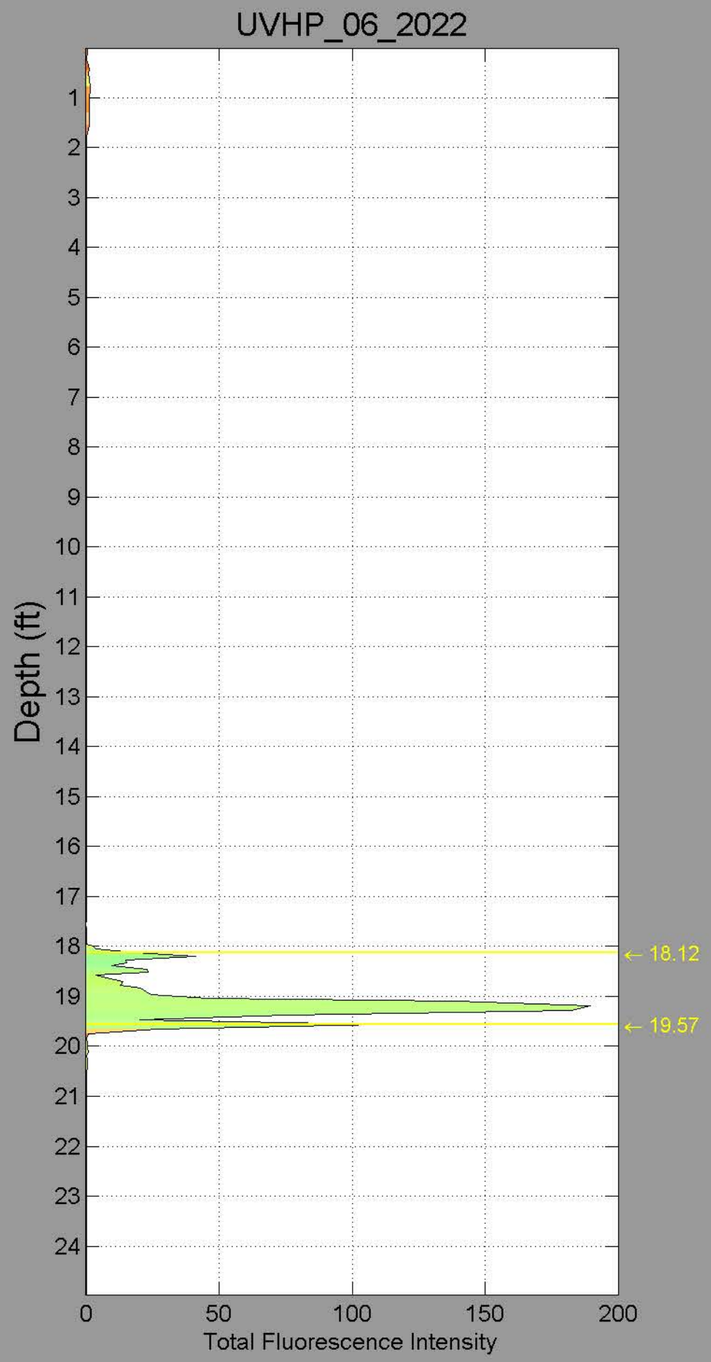








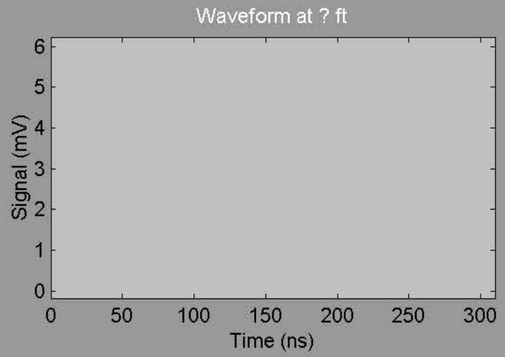
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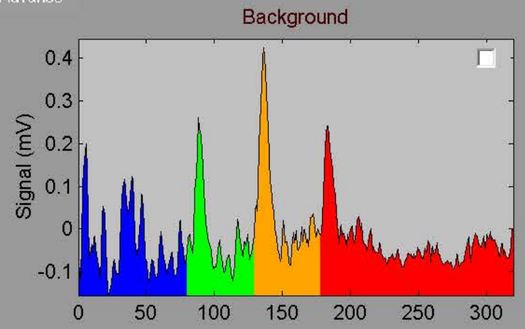
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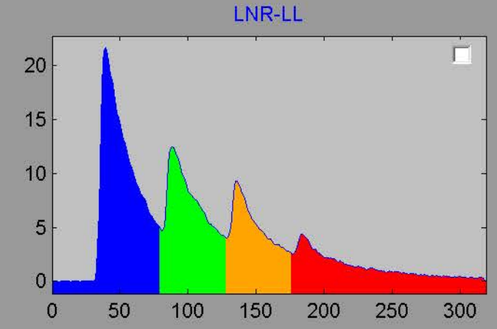
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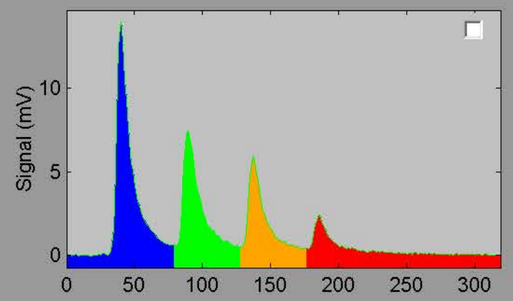
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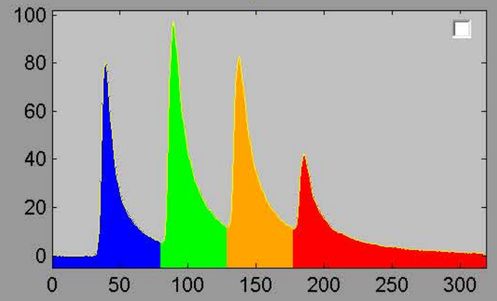


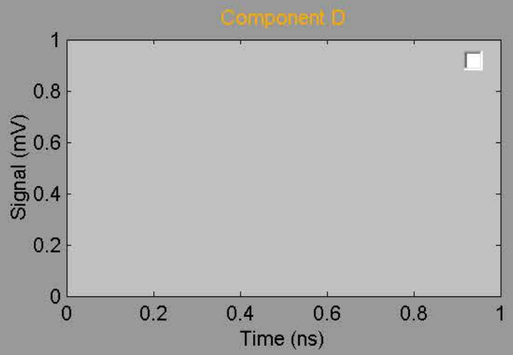


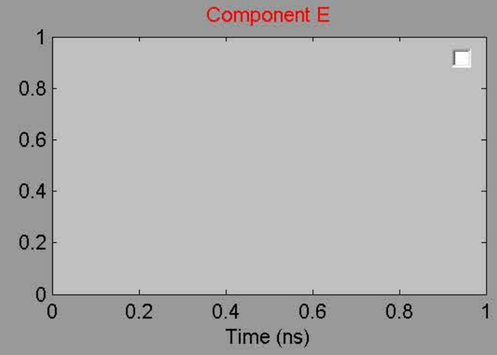




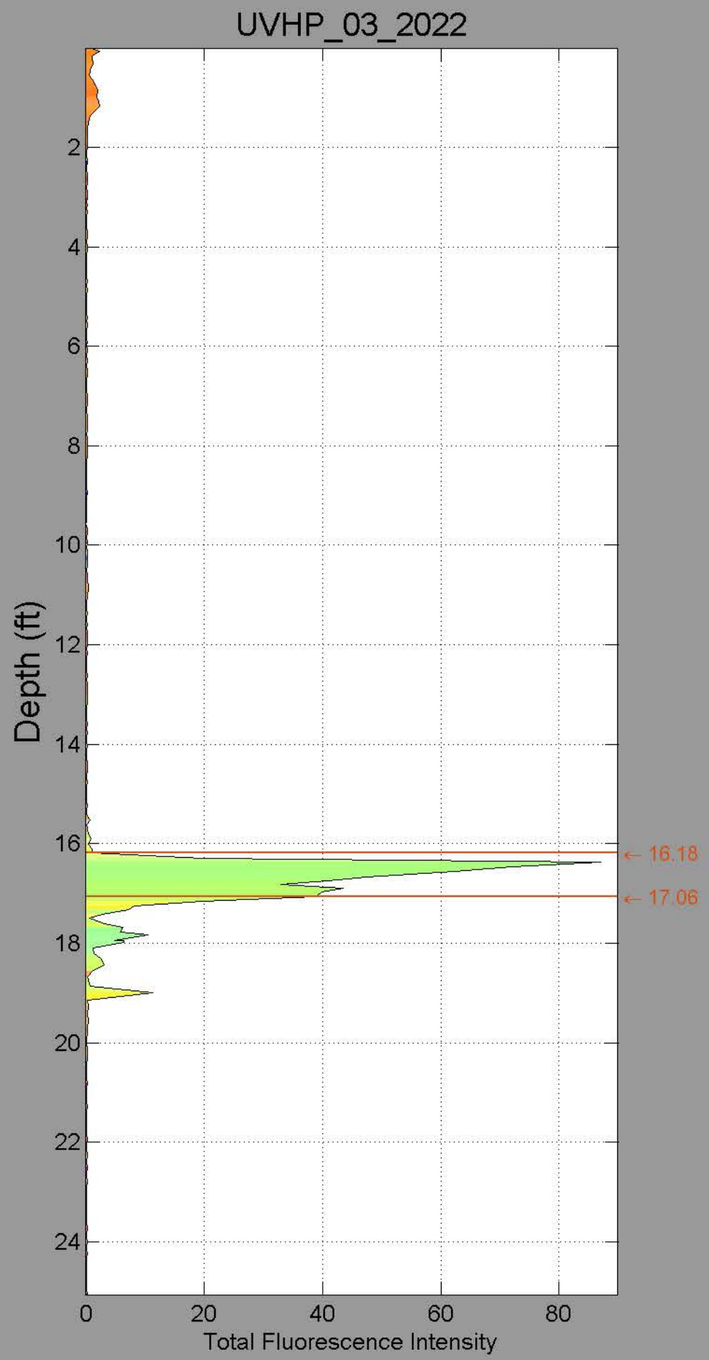








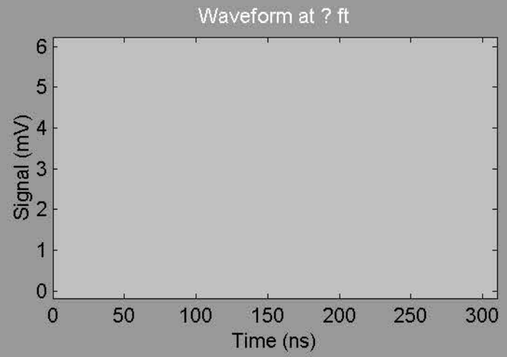
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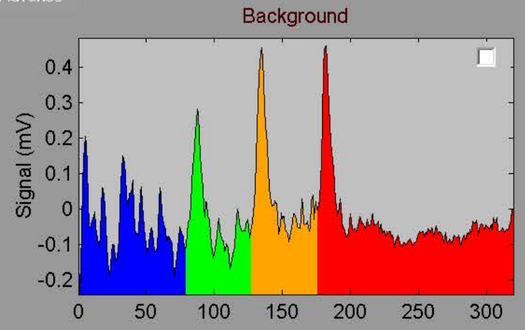
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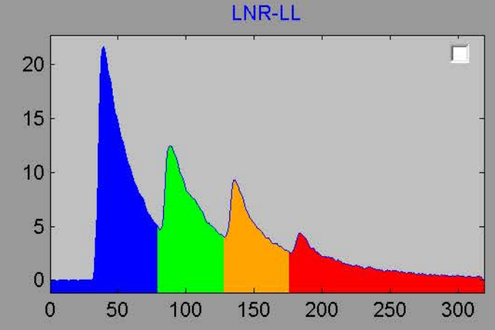
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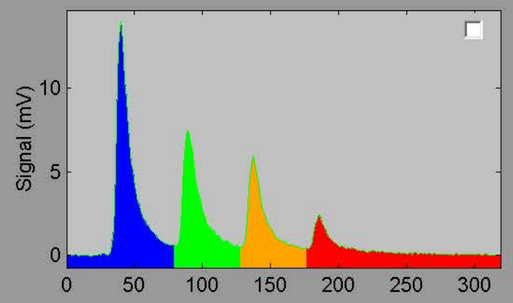
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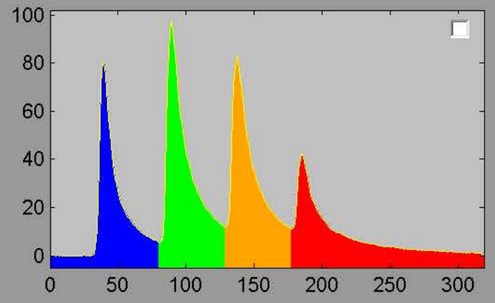


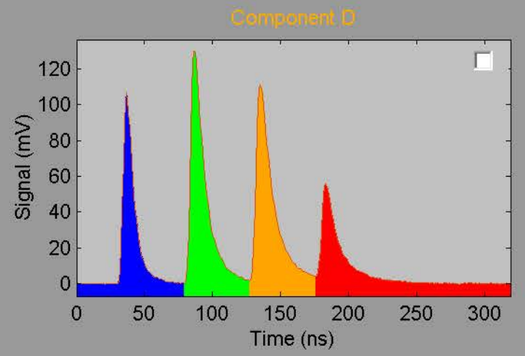


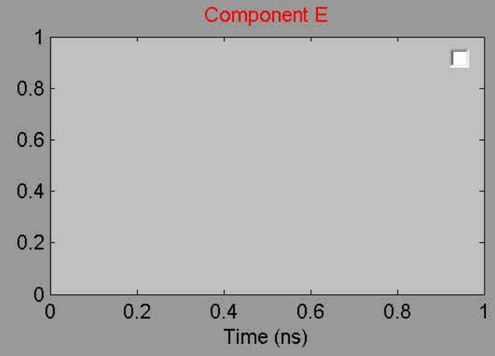




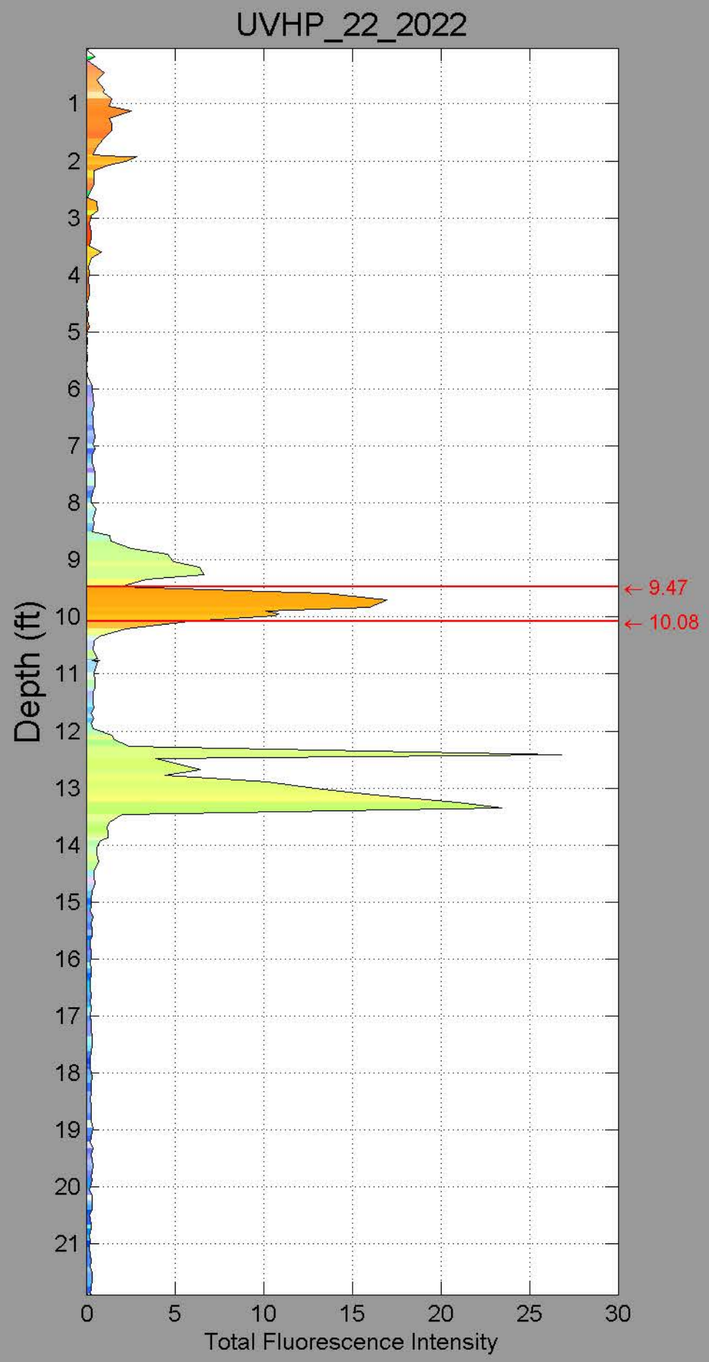








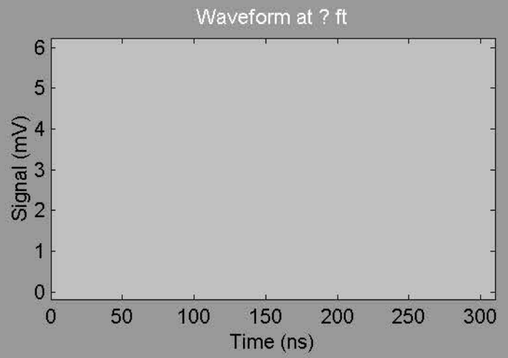
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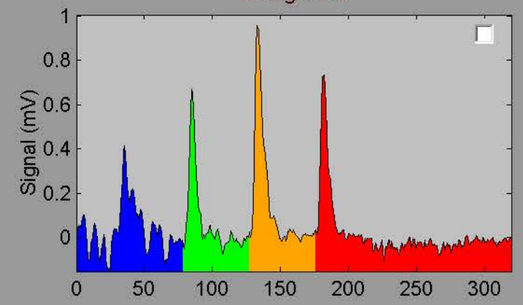
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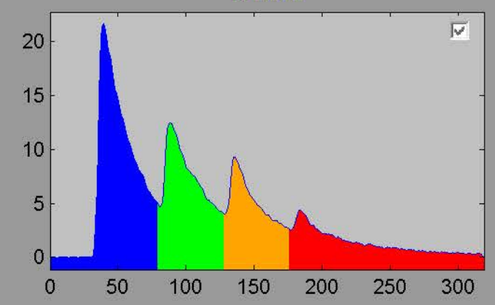
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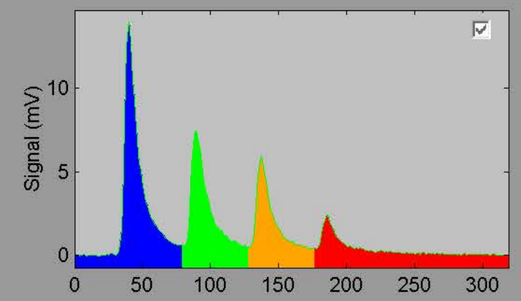
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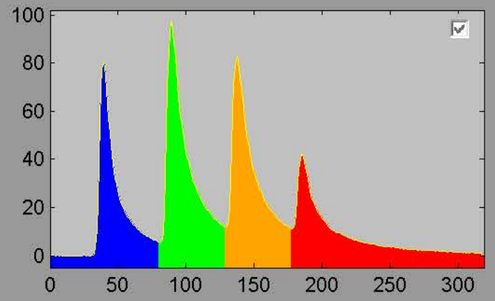


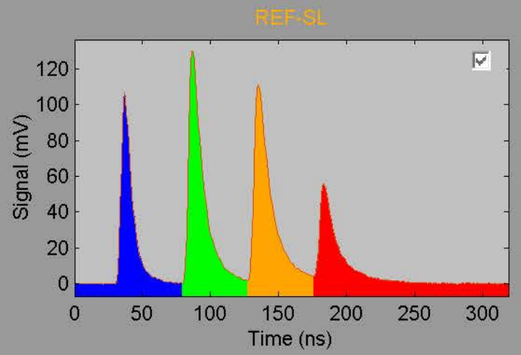


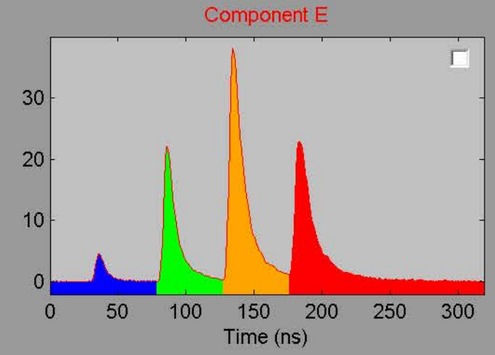




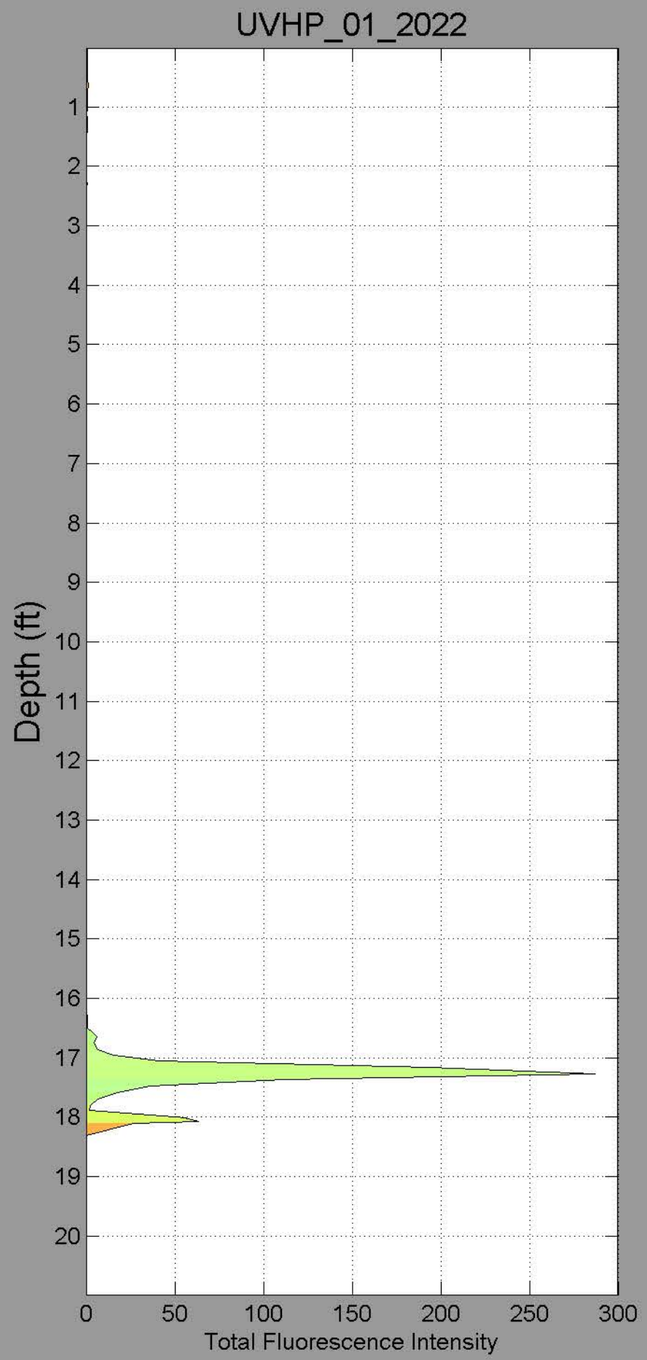




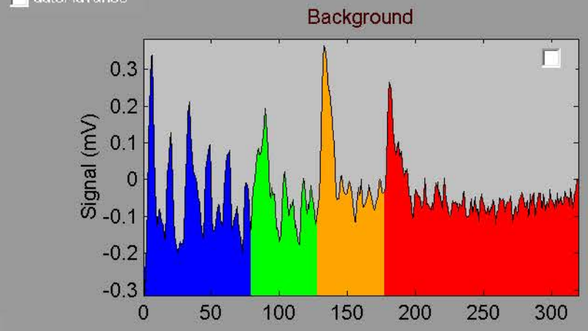


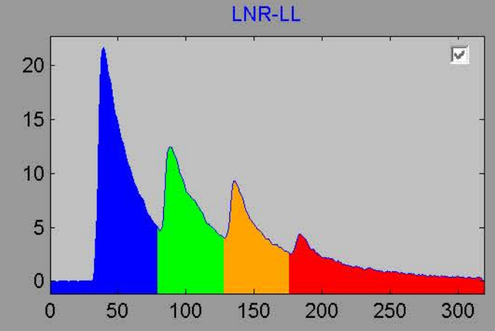


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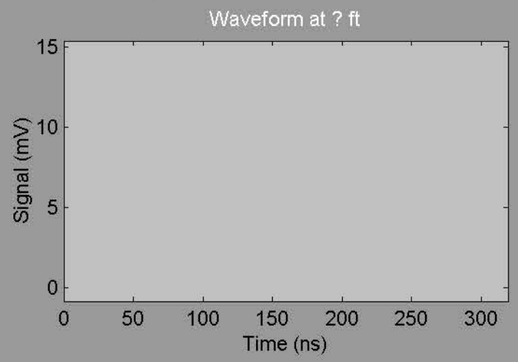


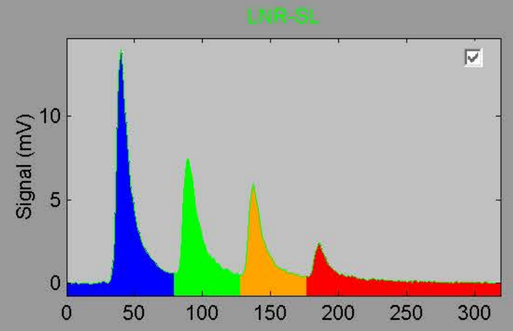
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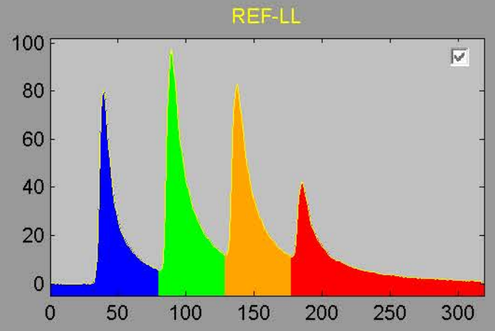




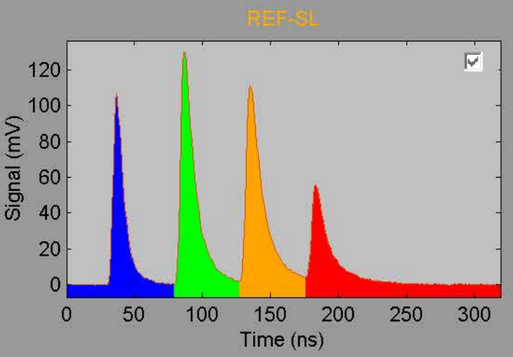
auto bkgd subtract NNLS on load

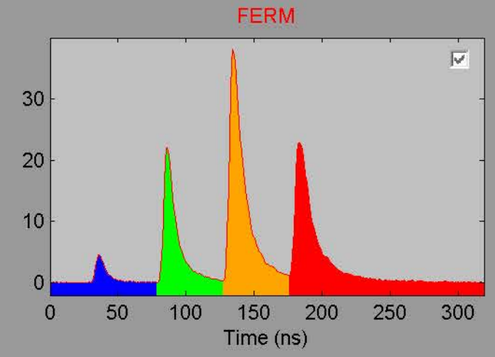




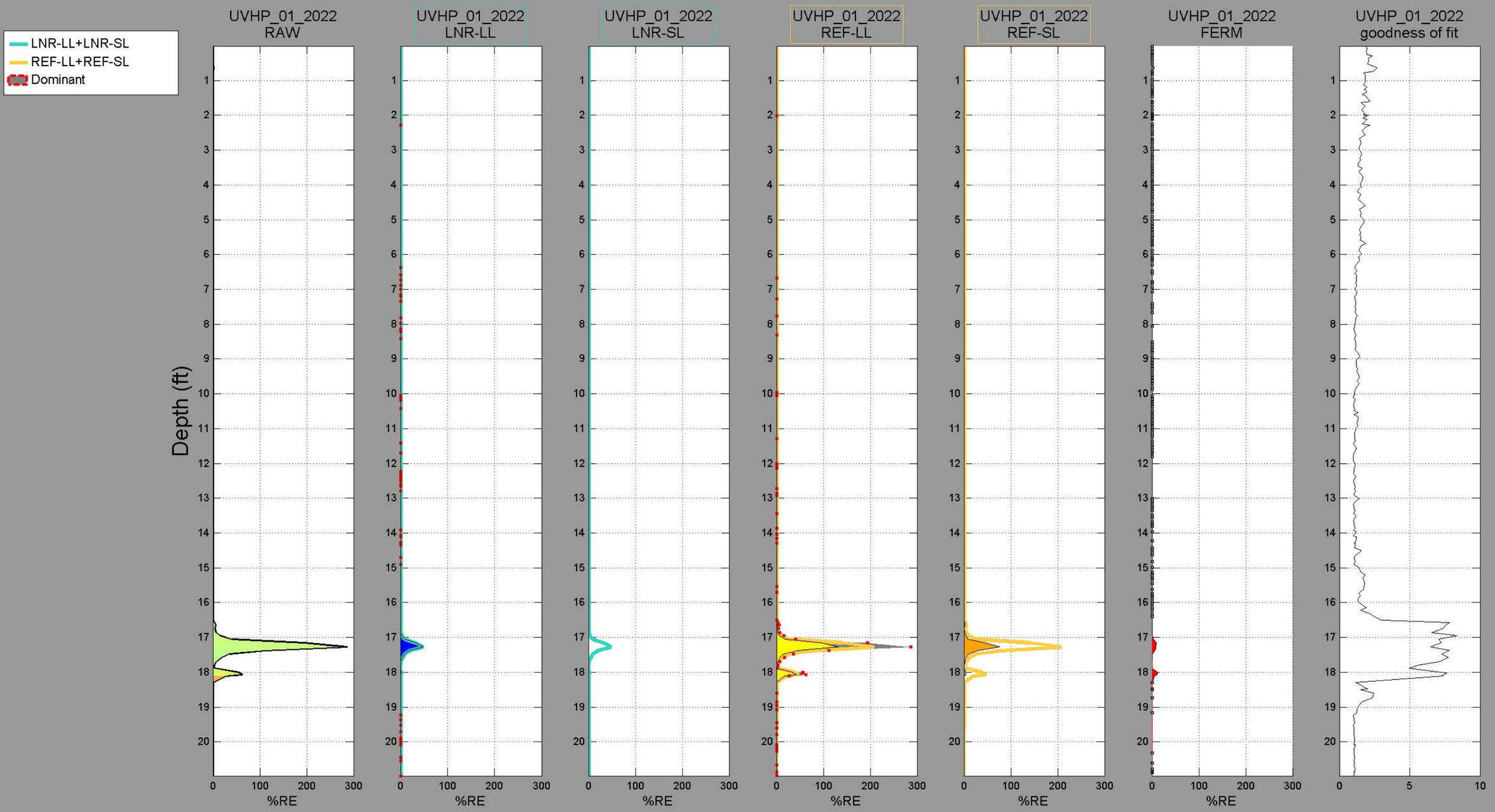


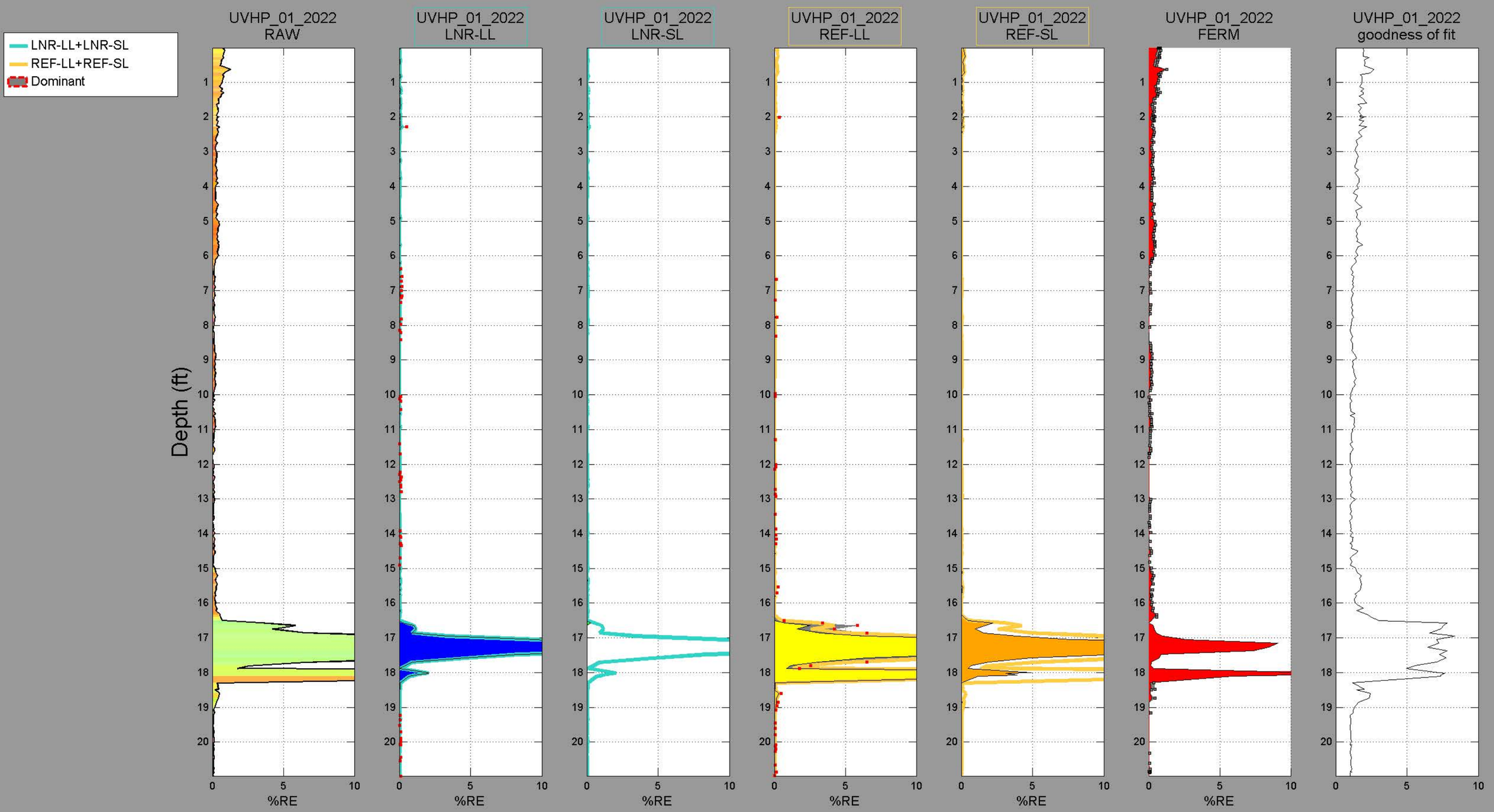


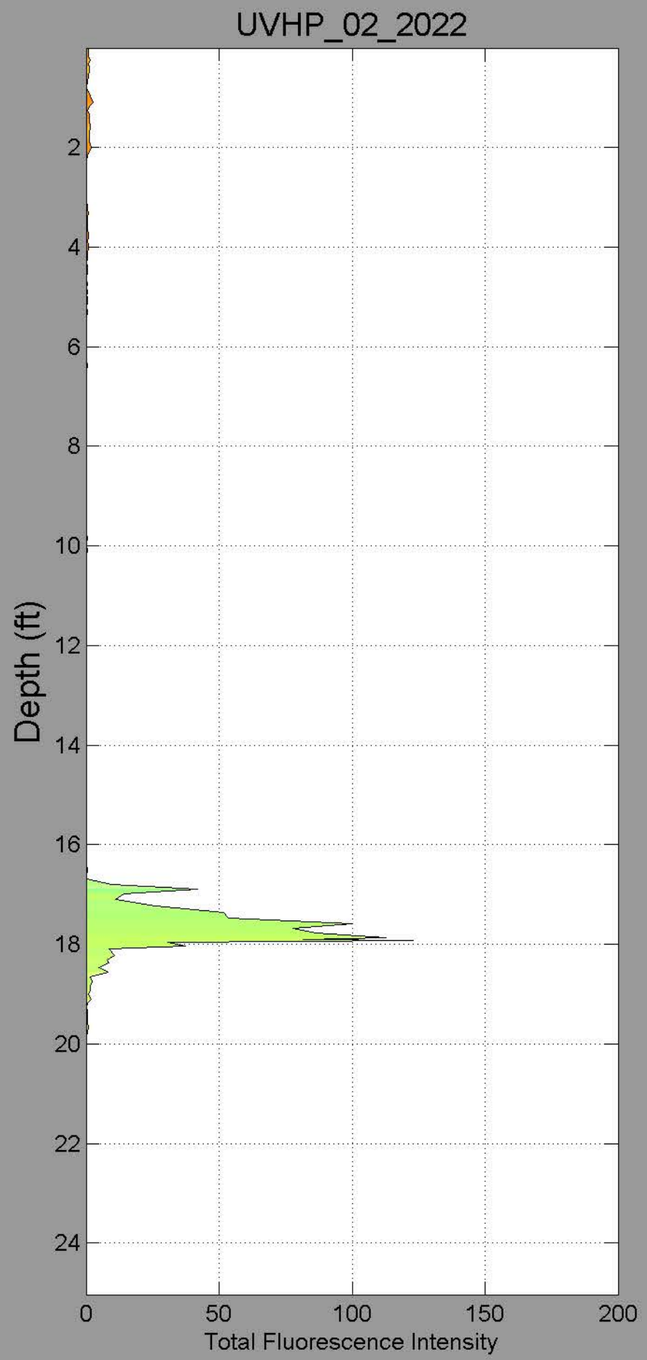




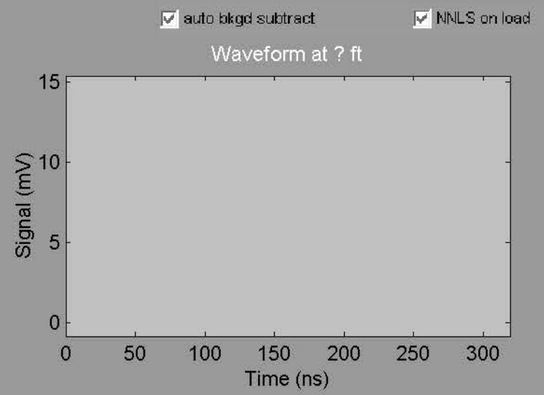
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LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_01_2022
RAW
UVHP_01_2022
LNR-LL
UVHP_01_2022
LNR-SL
UVHP_01_2022
REF-LL
UVHP_01_2022
REF-SL
UVHP_01_2022
FERM
UVHP_01_2022
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Depth (ft)
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%RE
%RE
%RE
%RE
%RE

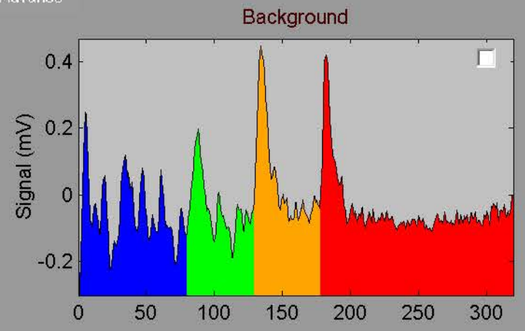

LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_01_2022
RAW
UVHP_01_2022
LNR-LL
UVHP_01_2022
LNR-SL
UVHP_01_2022
REF-LL
UVHP_01_2022
REF-SL
UVHP_01_2022
FERM
UVHP_01_2022
goodness of fit
Depth (ft)
%RE
0
5
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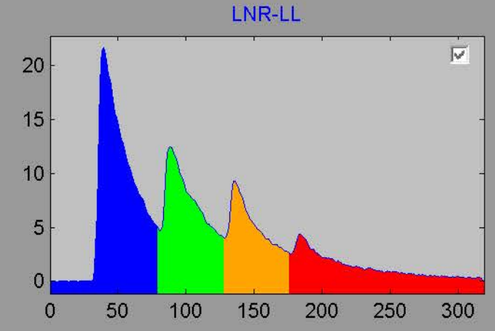


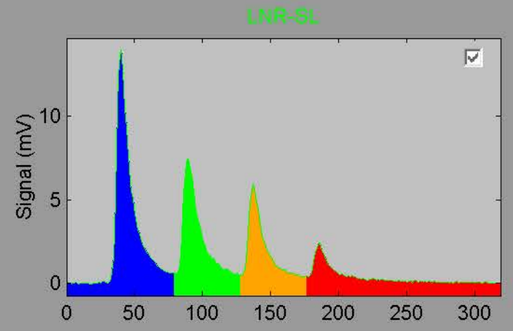
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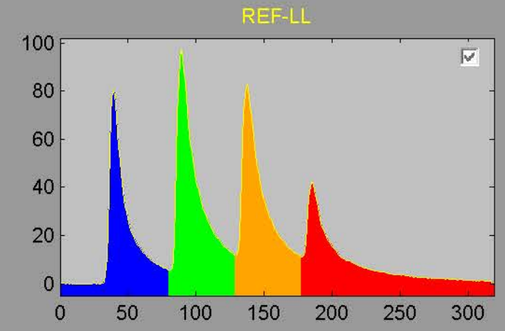


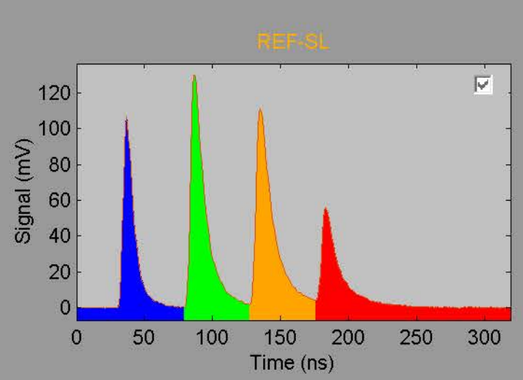


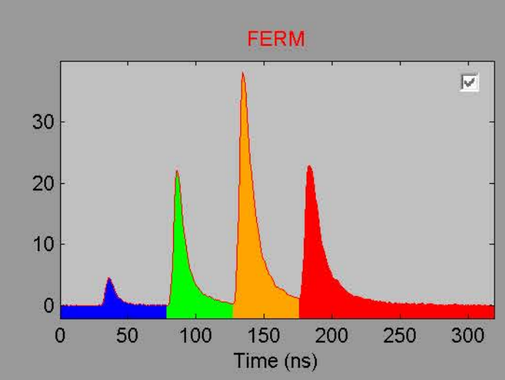




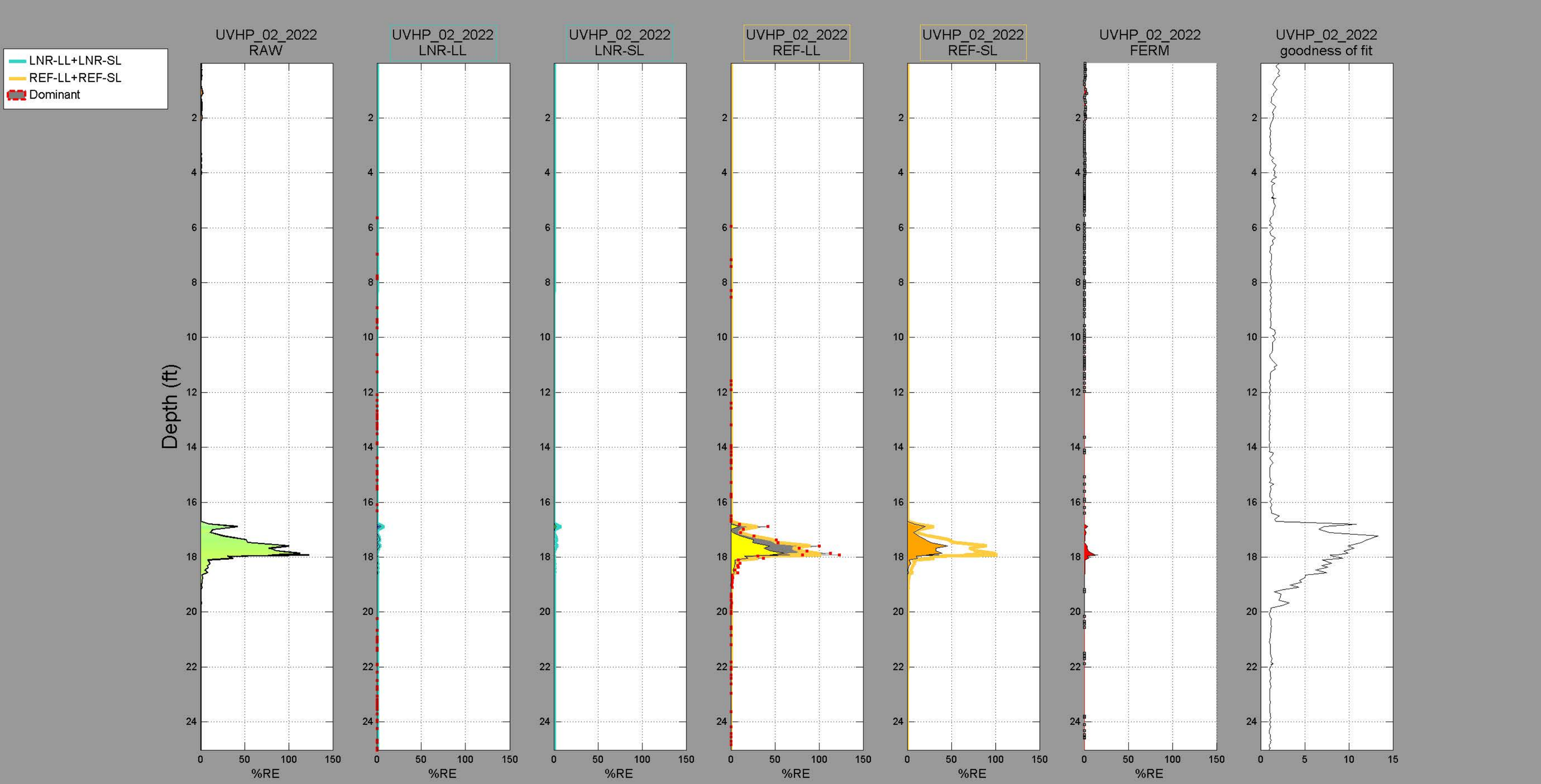


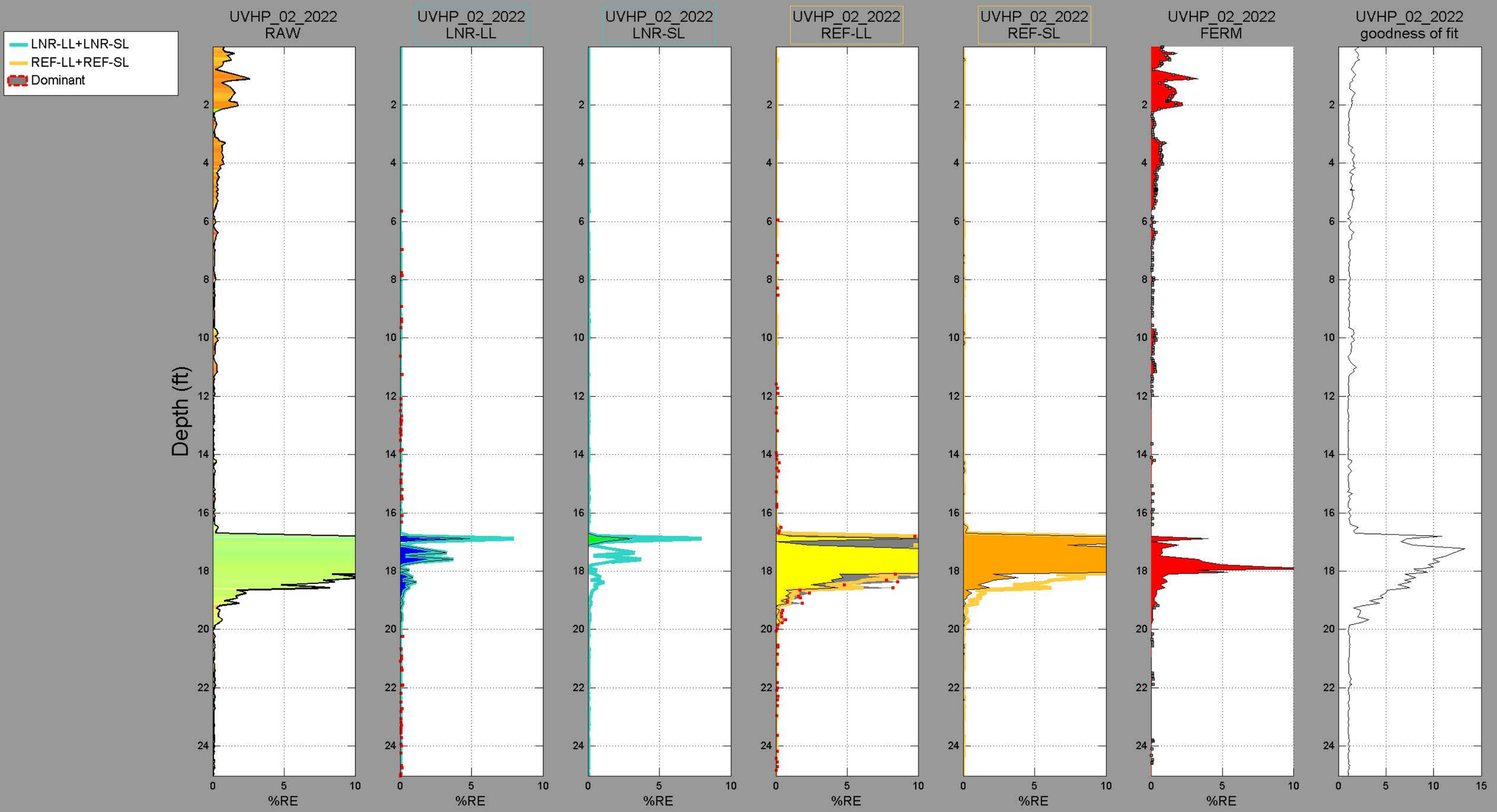


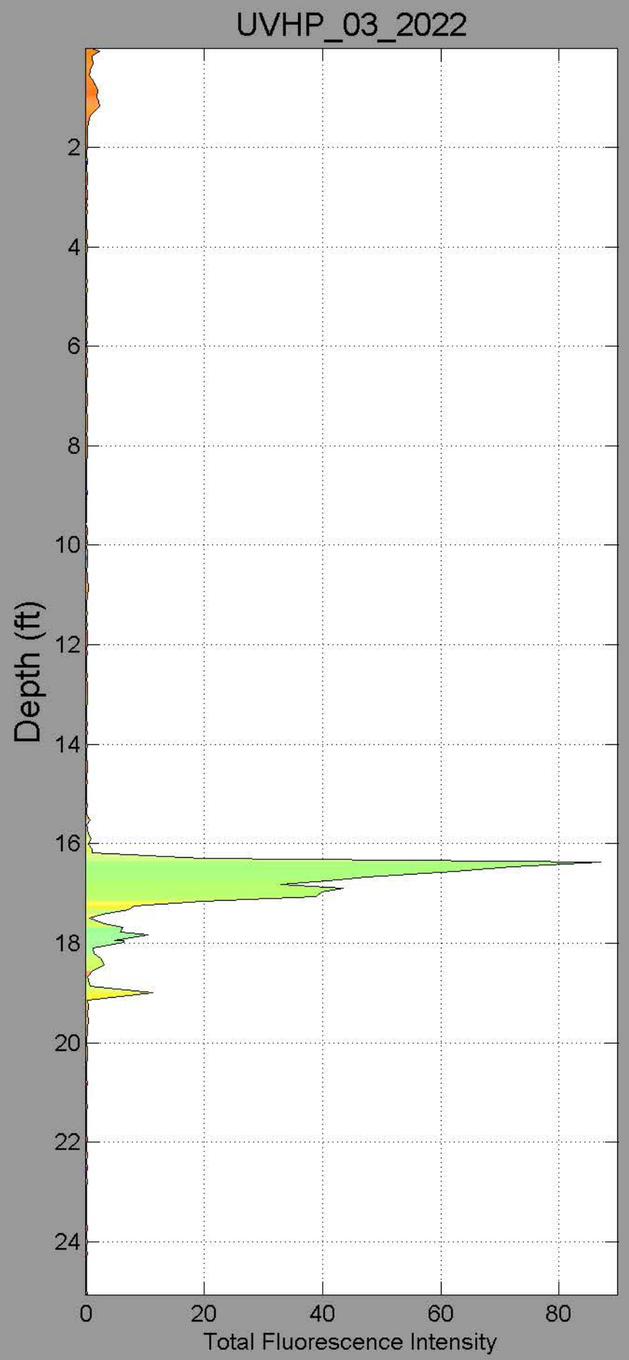




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LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_02_2022
RAW
UVHP_02_2022
LNR-LL
UVHP_02_2022
LNR-SL
UVHP_02_2022
REF-LL
UVHP_02_2022
REF-SL
UVHP_02_2022
FERM
UVHP_02_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
%RE
%RE
%RE
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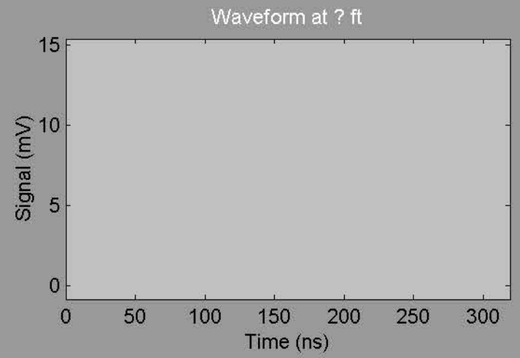

LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_02_2022
RAW
UVHP_02_2022
LNR-LL
UVHP_02_2022
LNR-SL
UVHP_02_2022
REF-LL
UVHP_02_2022
REF-SL
UVHP_02_2022
FERM
UVHP_02_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
%RE
%RE
%RE



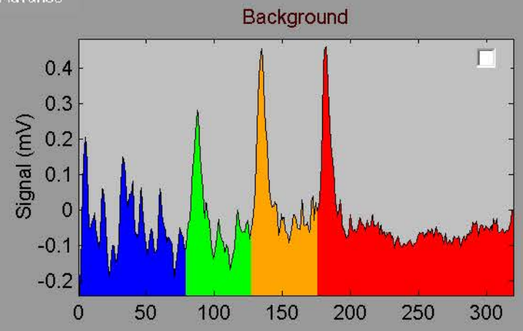
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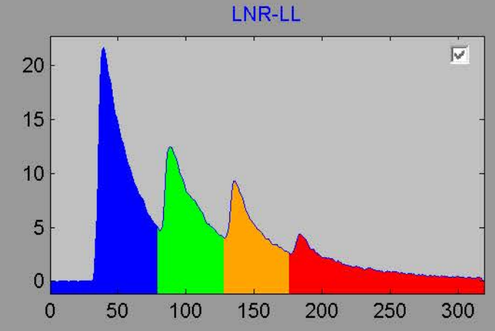
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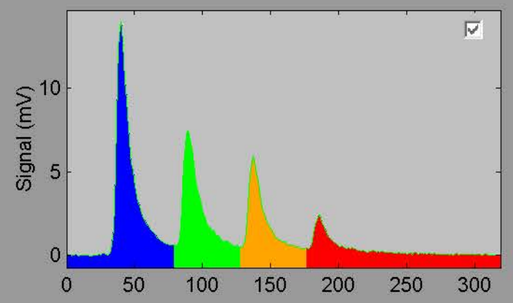
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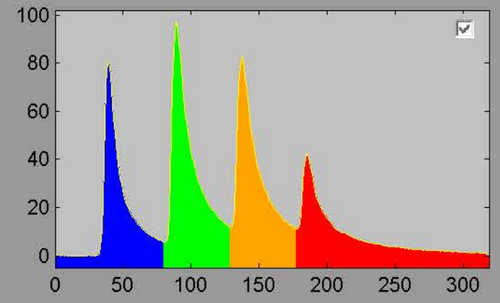


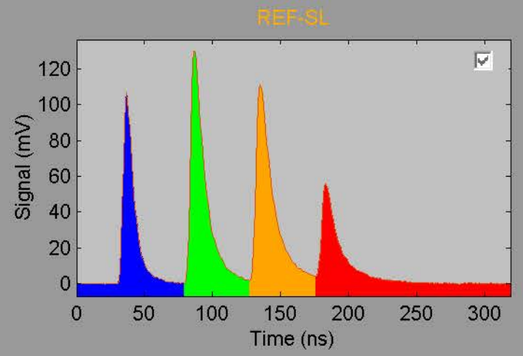


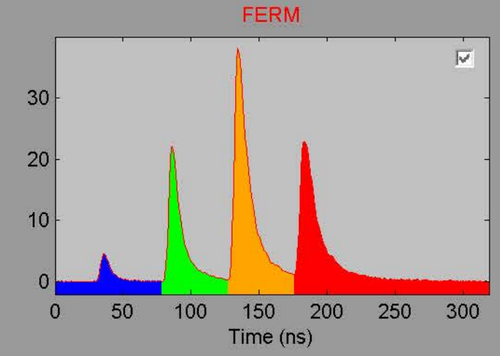




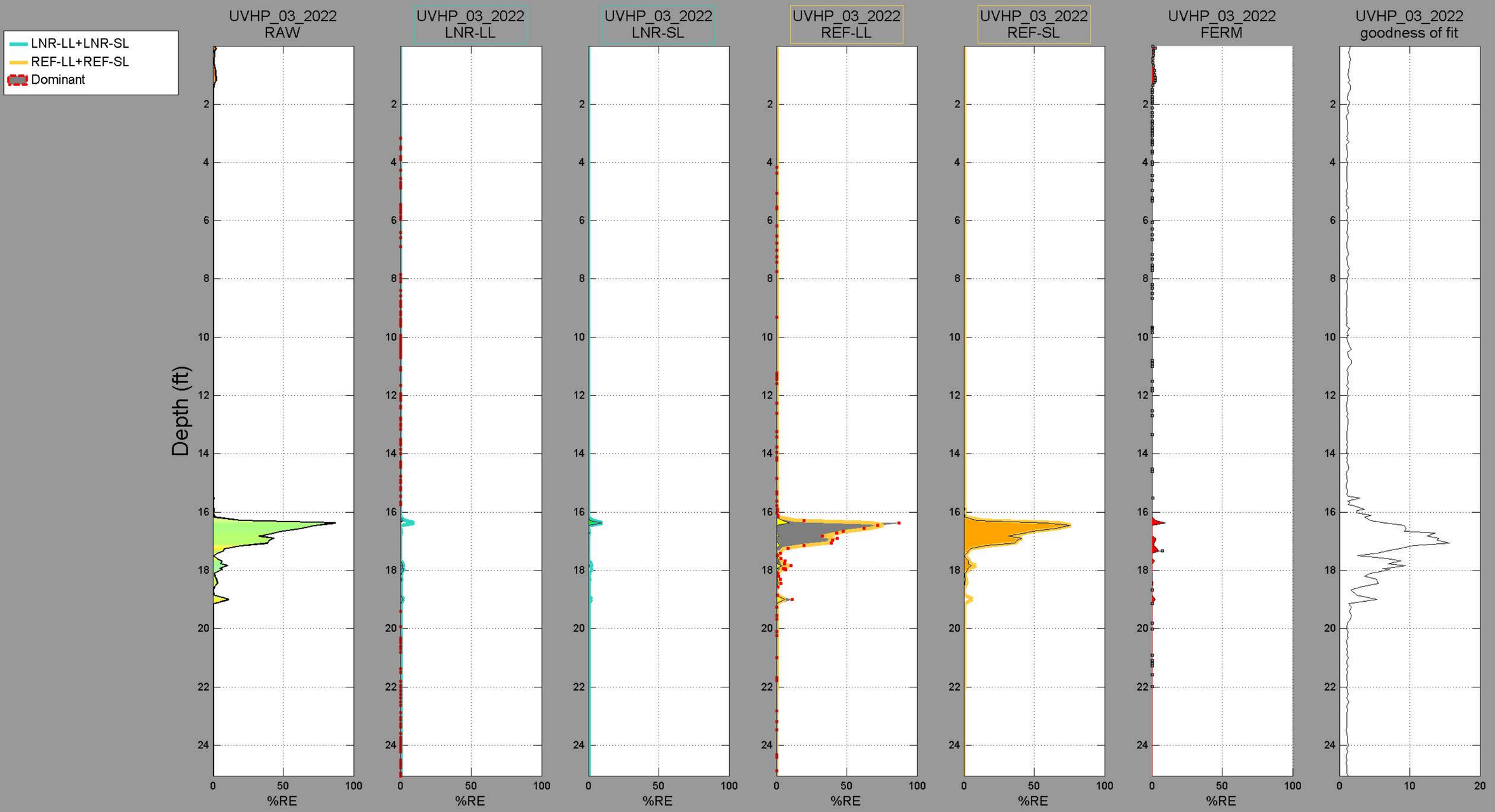


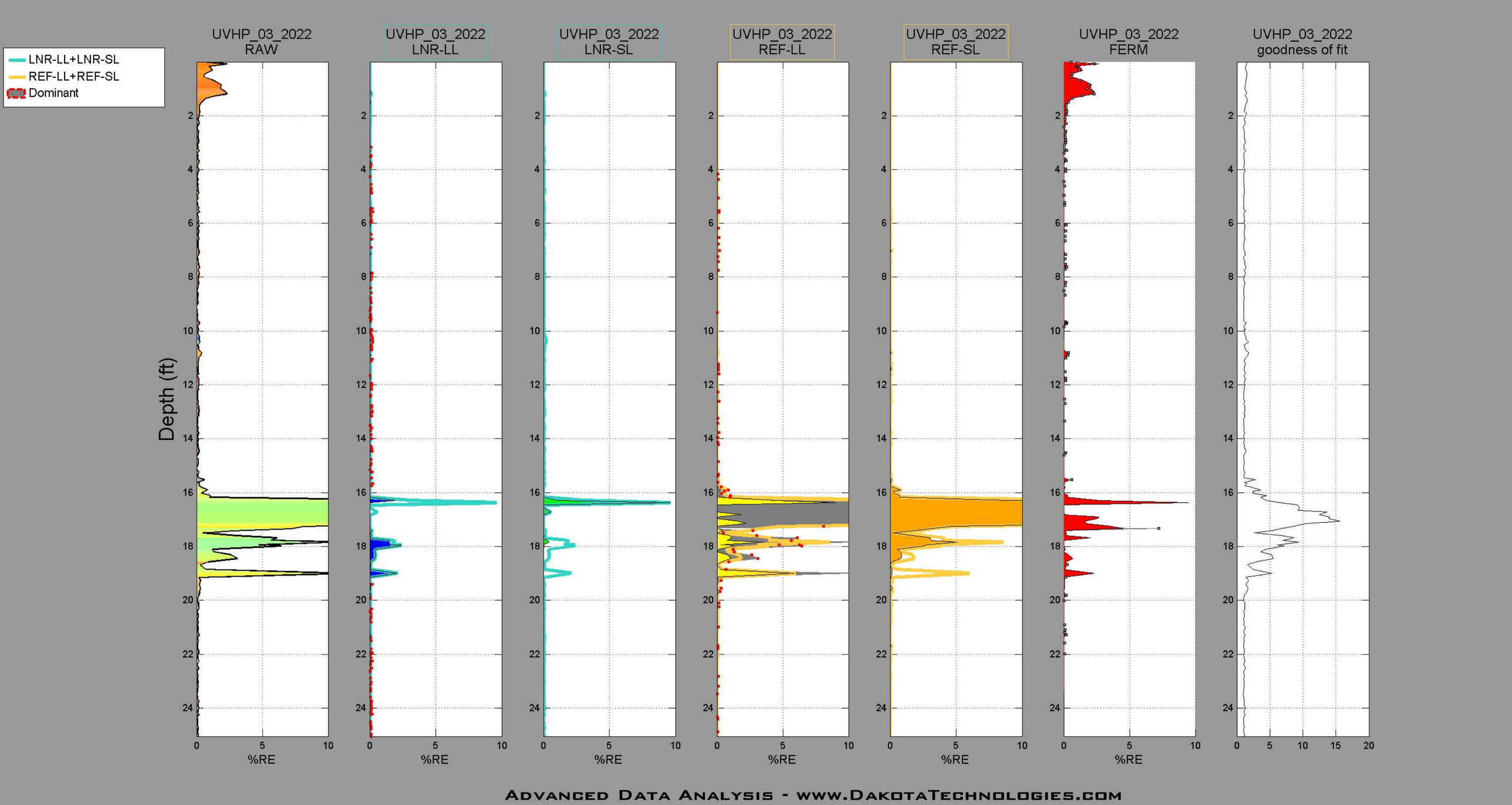


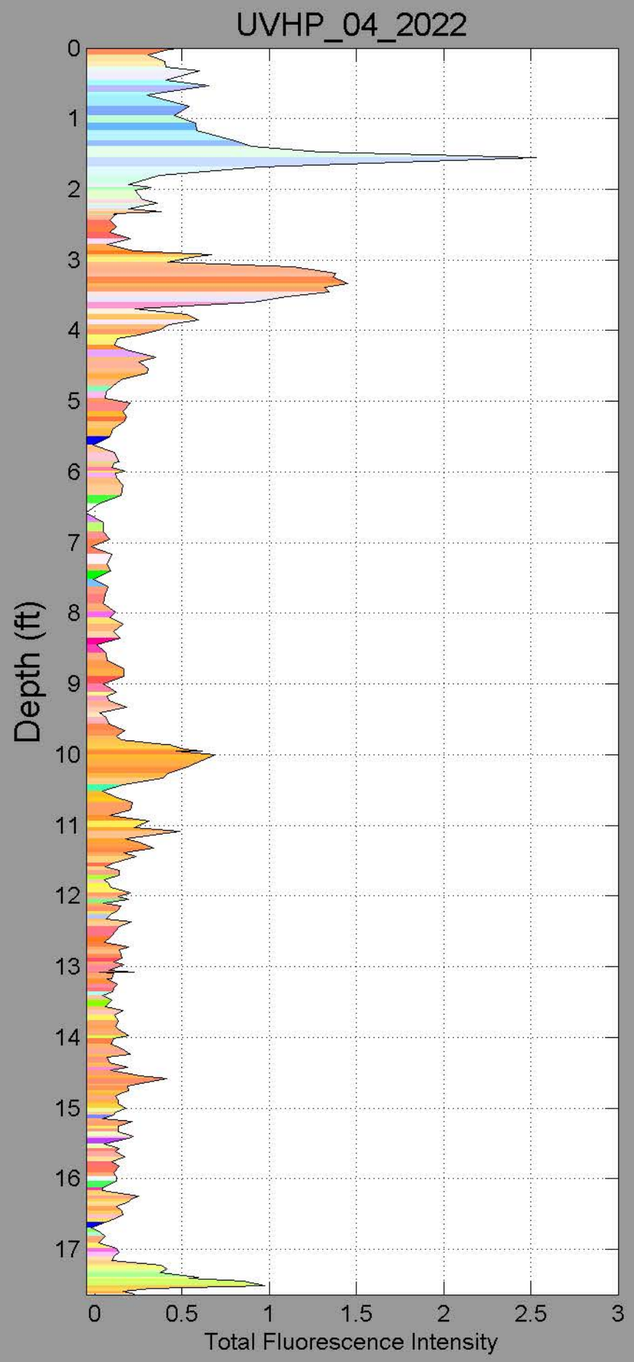




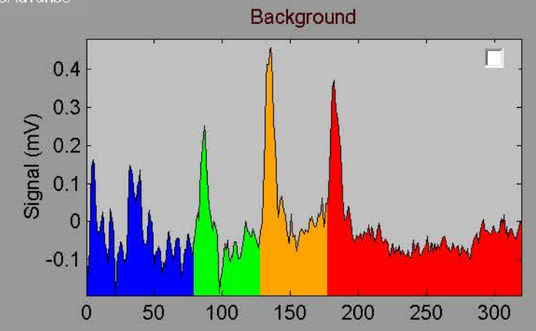
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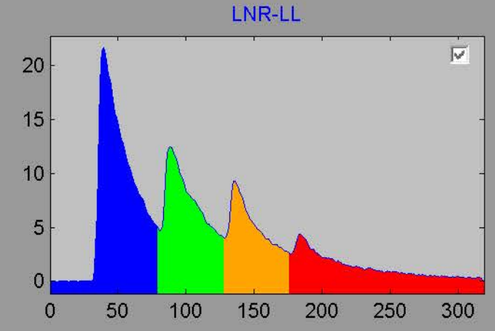

LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_03_2022
RAW
UVHP_03_2022
LNR-LL
UVHP_03_2022
LNR-SL
UVHP_03_2022
REF-LL
UVHP_03_2022
REF-SL
UVHP_03_2022
FERM
UVHP_03_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
%RE
%RE


LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_03_2022
RAW
UVHP_03_2022
LNR-LL
UVHP_03_2022
LNR-SL
UVHP_03_2022
REF-LL
UVHP_03_2022
REF-SL
UVHP_03_2022
FERM
UVHP_03_2022
goodness of fit
Depth (ft)
%RE
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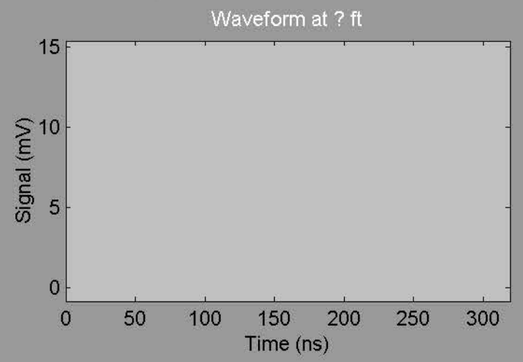


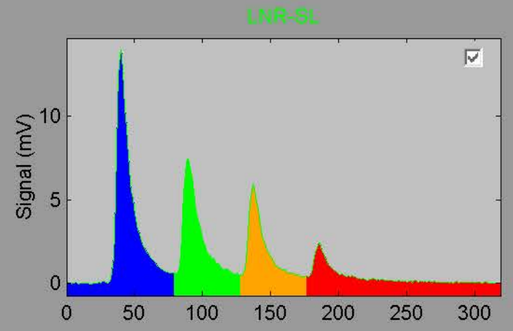
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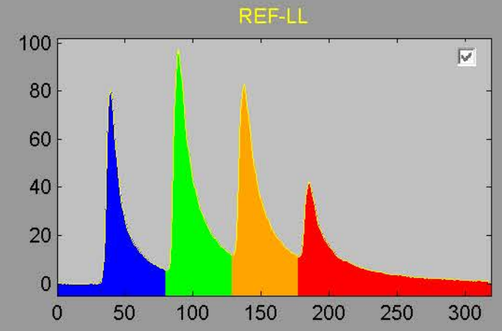




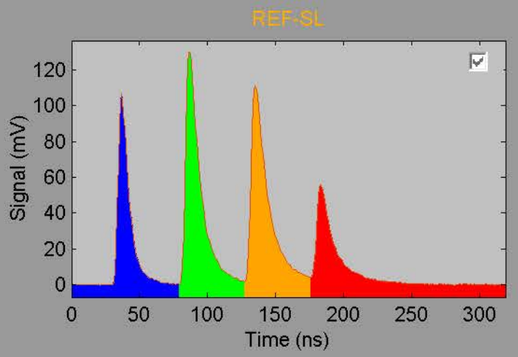
auto bkgd subtract NNLS on load

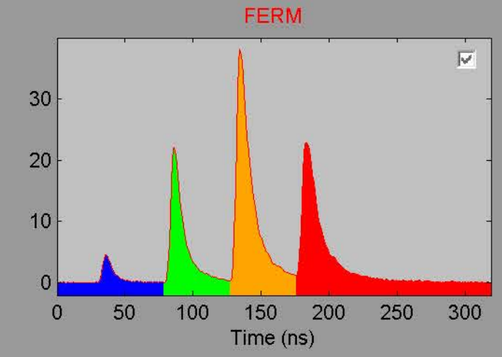




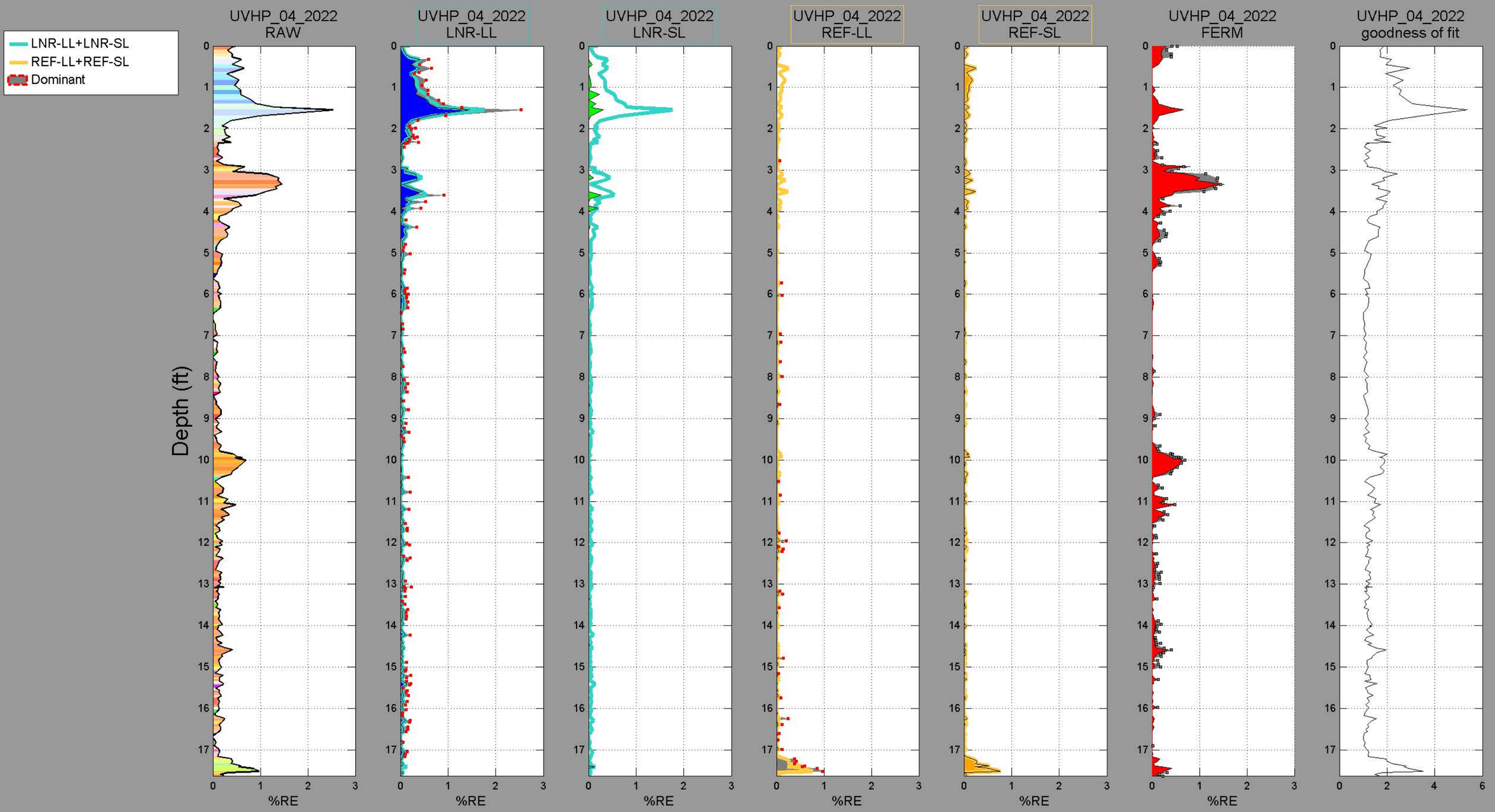


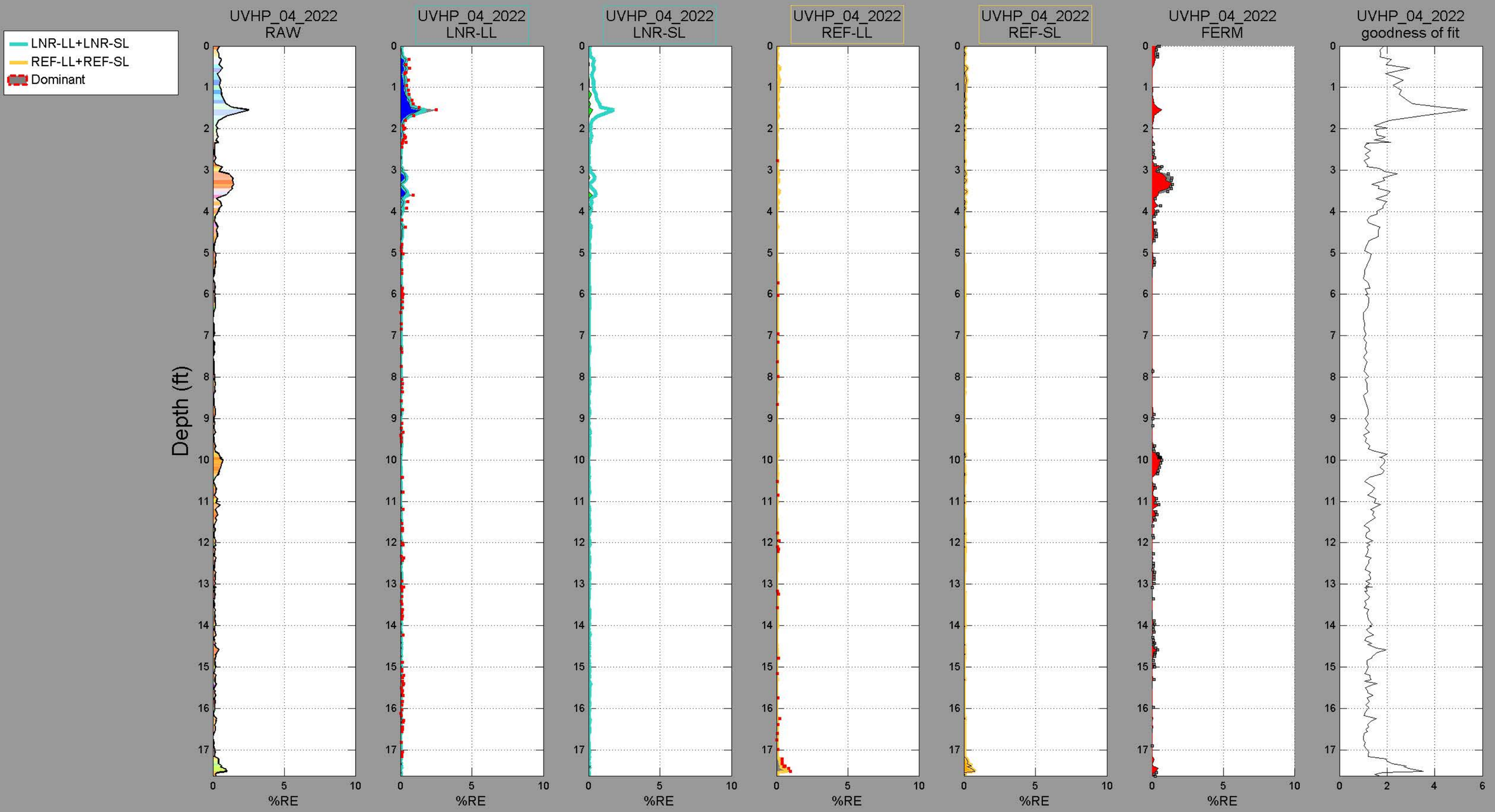


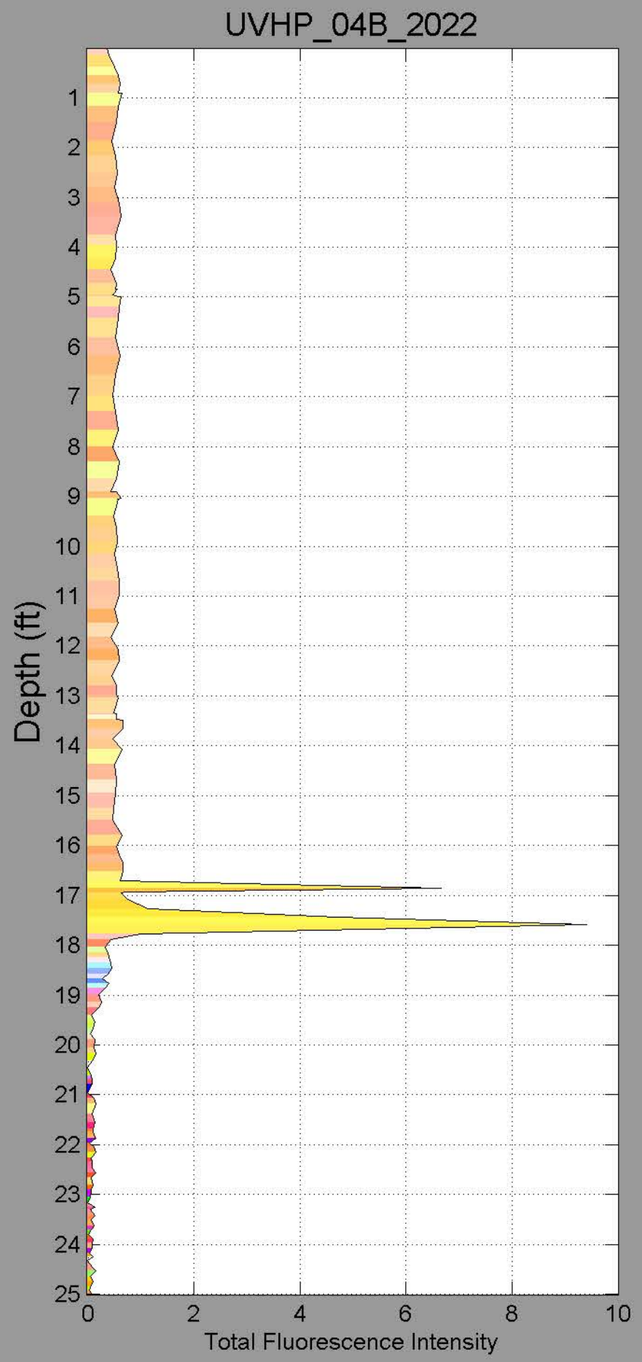




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LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_04_2022
RAW
UVHP_04_2022
LNR-LL
UVHP_04_2022
LNR-SL
UVHP_04_2022
REF-LL
UVHP_04_2022
REF-SL
UVHP_04_2022
FERM
UVHP_04_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
%RE
%RE
%RE

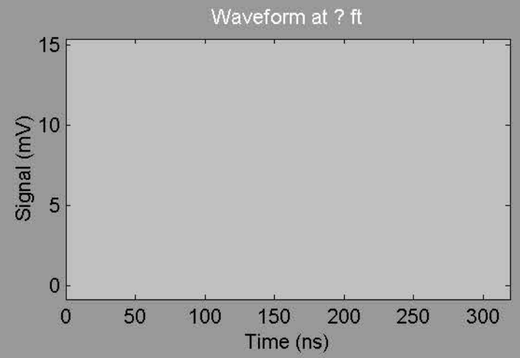

LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_04_2022
RAW
UVHP_04_2022
LNR-LL
UVHP_04_2022
LNR-SL
UVHP_04_2022
REF-LL
UVHP_04_2022
REF-SL
UVHP_04_2022
FERM
UVHP_04_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
%RE
%RE
%RE



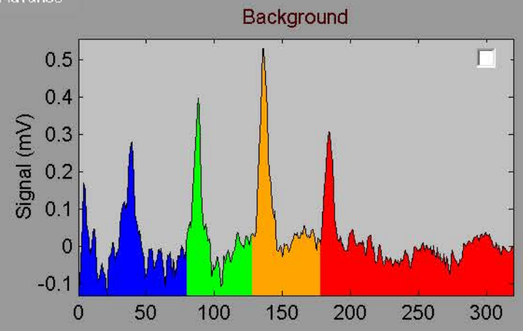
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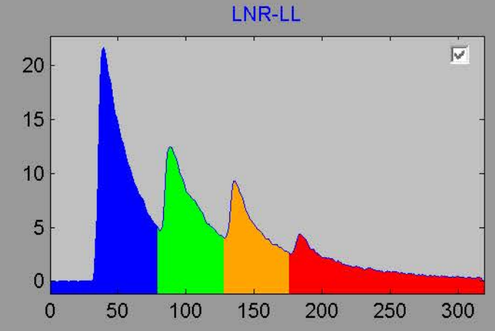
auto bkgd subtract

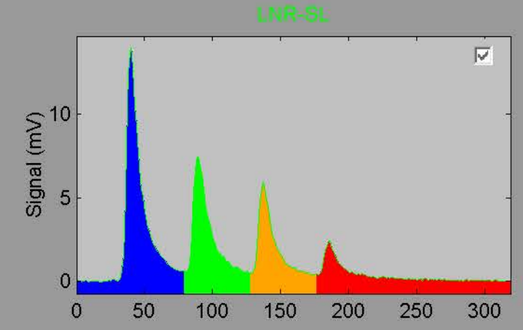
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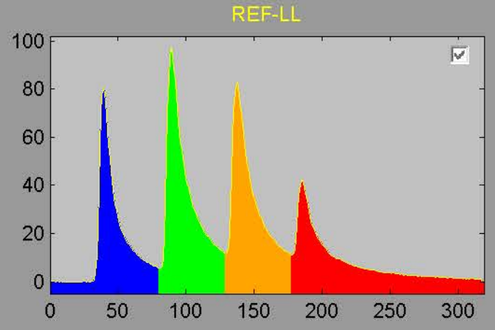


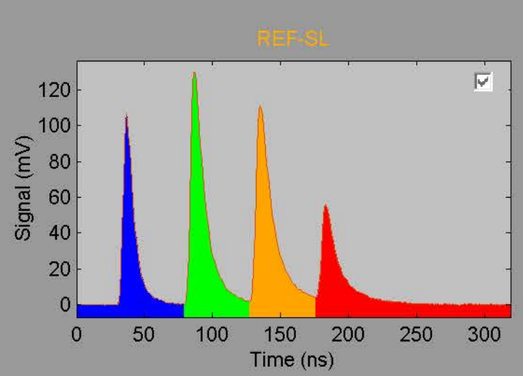


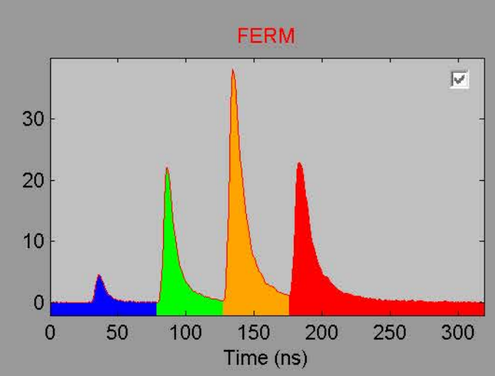




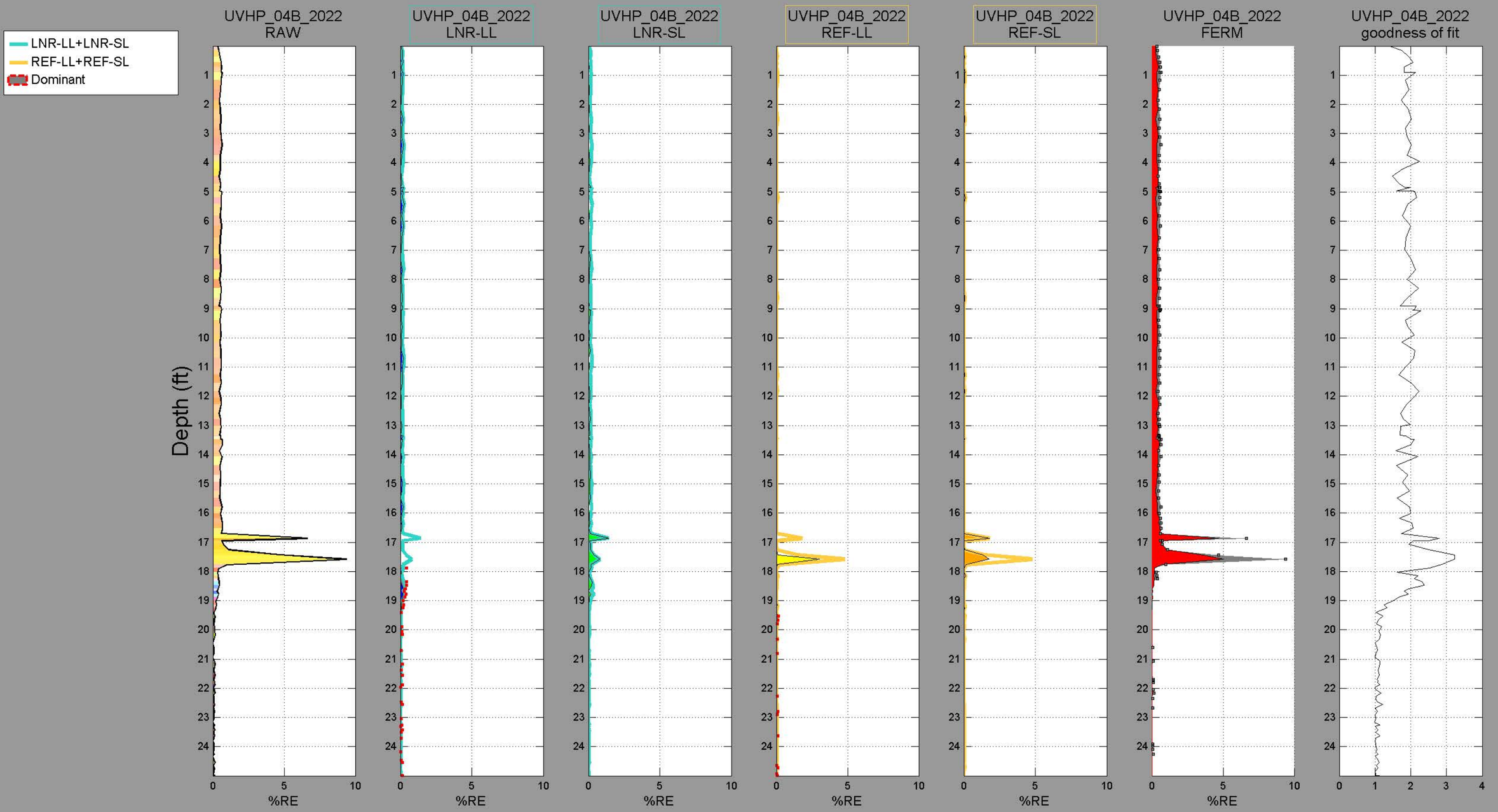


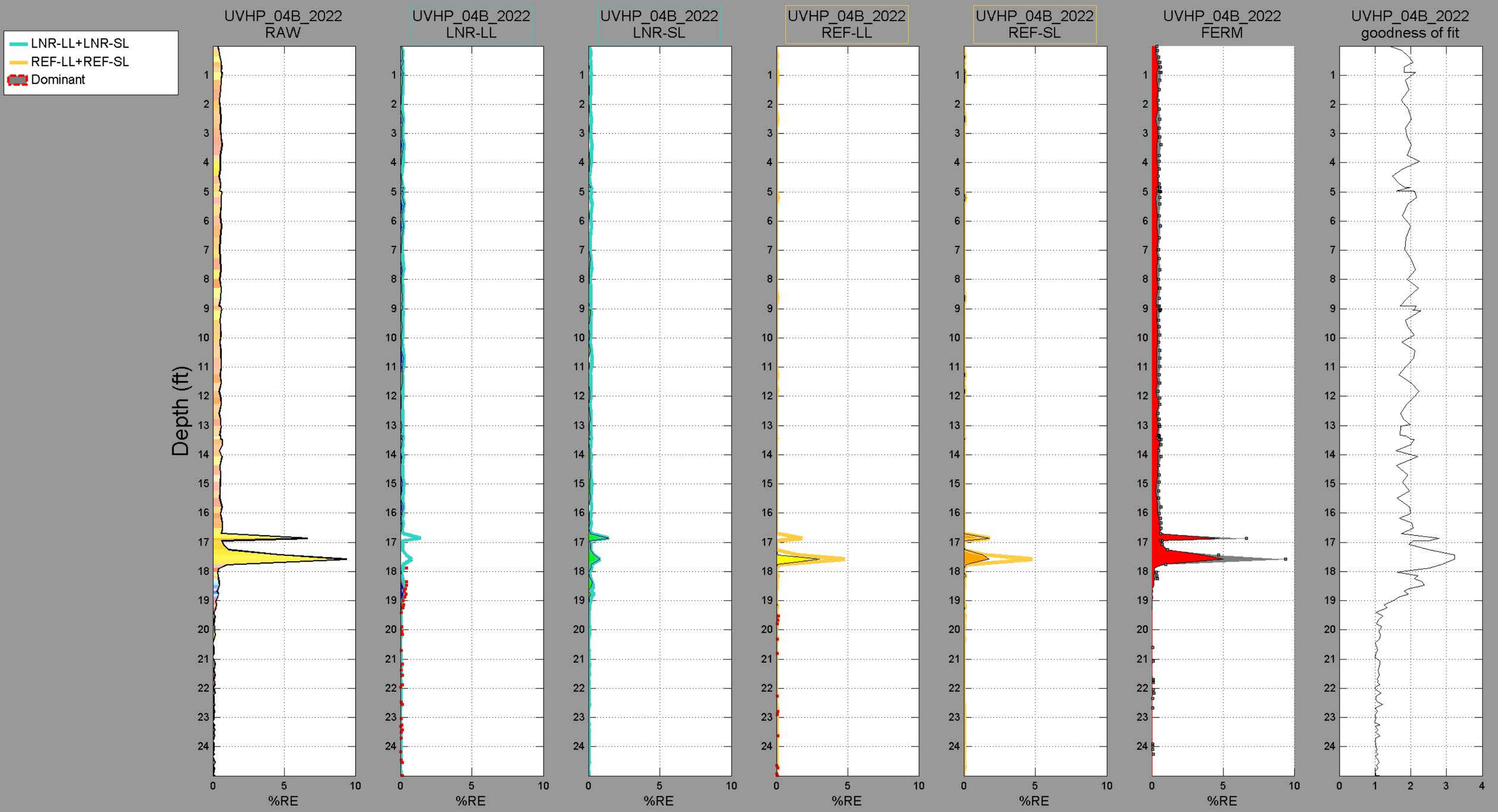


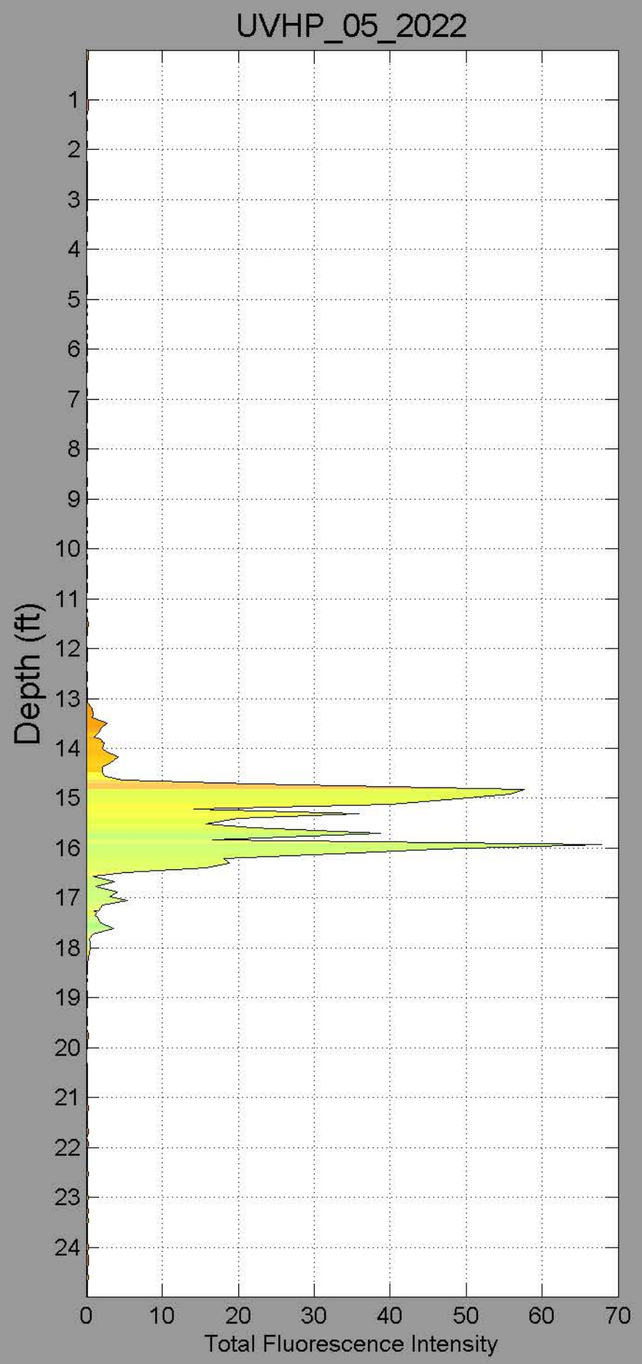




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LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_04B_2022
RAW
UVHP_04B_2022
LNR-LL
UVHP_04B_2022
LNR-SL
UVHP_04B_2022
REF-LL
UVHP_04B_2022
REF-SL
UVHP_04B_2022
FERM
UVHP_04B_2022
goodness of fit
Depth (ft)
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%RE
%RE
%RE
%RE
%RE
%RE

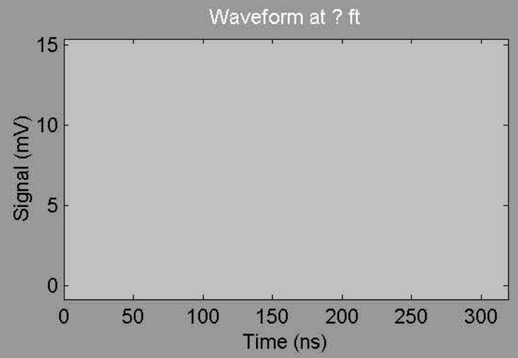

LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_04B_2022
RAW
UVHP_04B_2022
LNR-LL
UVHP_04B_2022
LNR-SL
UVHP_04B_2022
REF-LL
UVHP_04B_2022
REF-SL
UVHP_04B_2022
FERM
UVHP_04B_2022
goodness of fit
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%RE
%RE
%RE
%RE



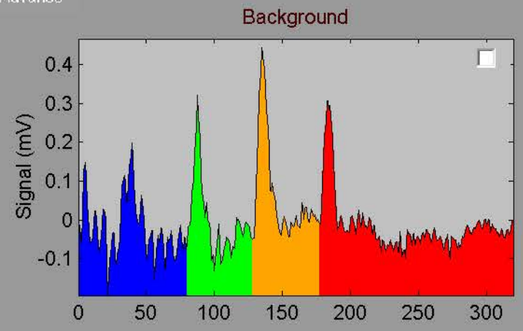
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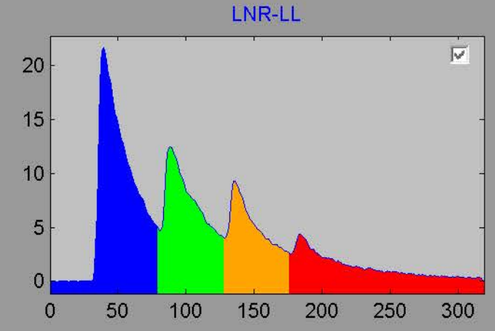
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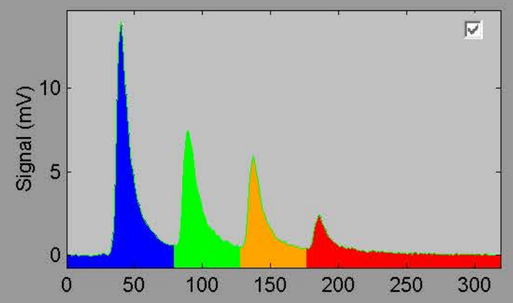
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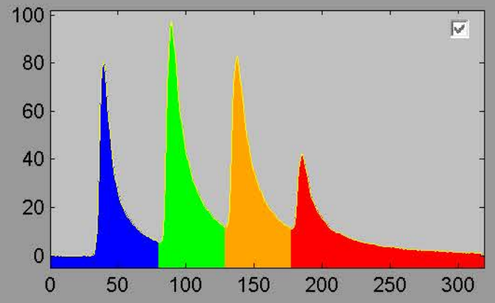


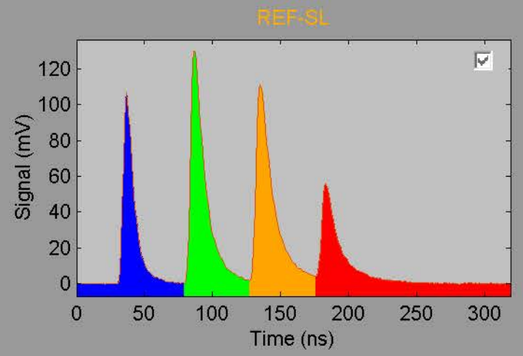


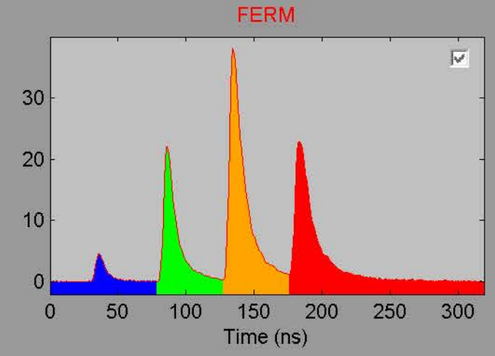




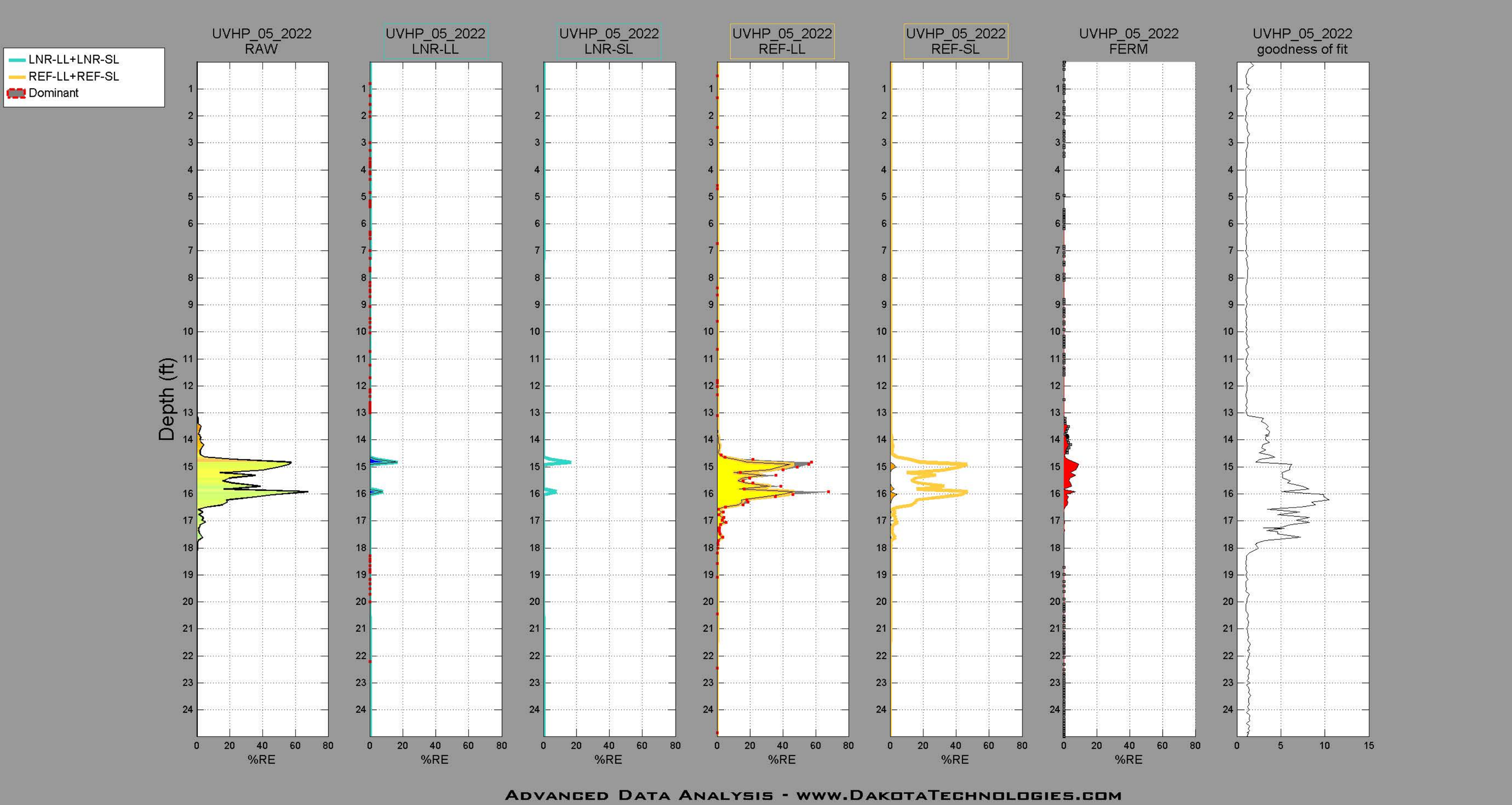


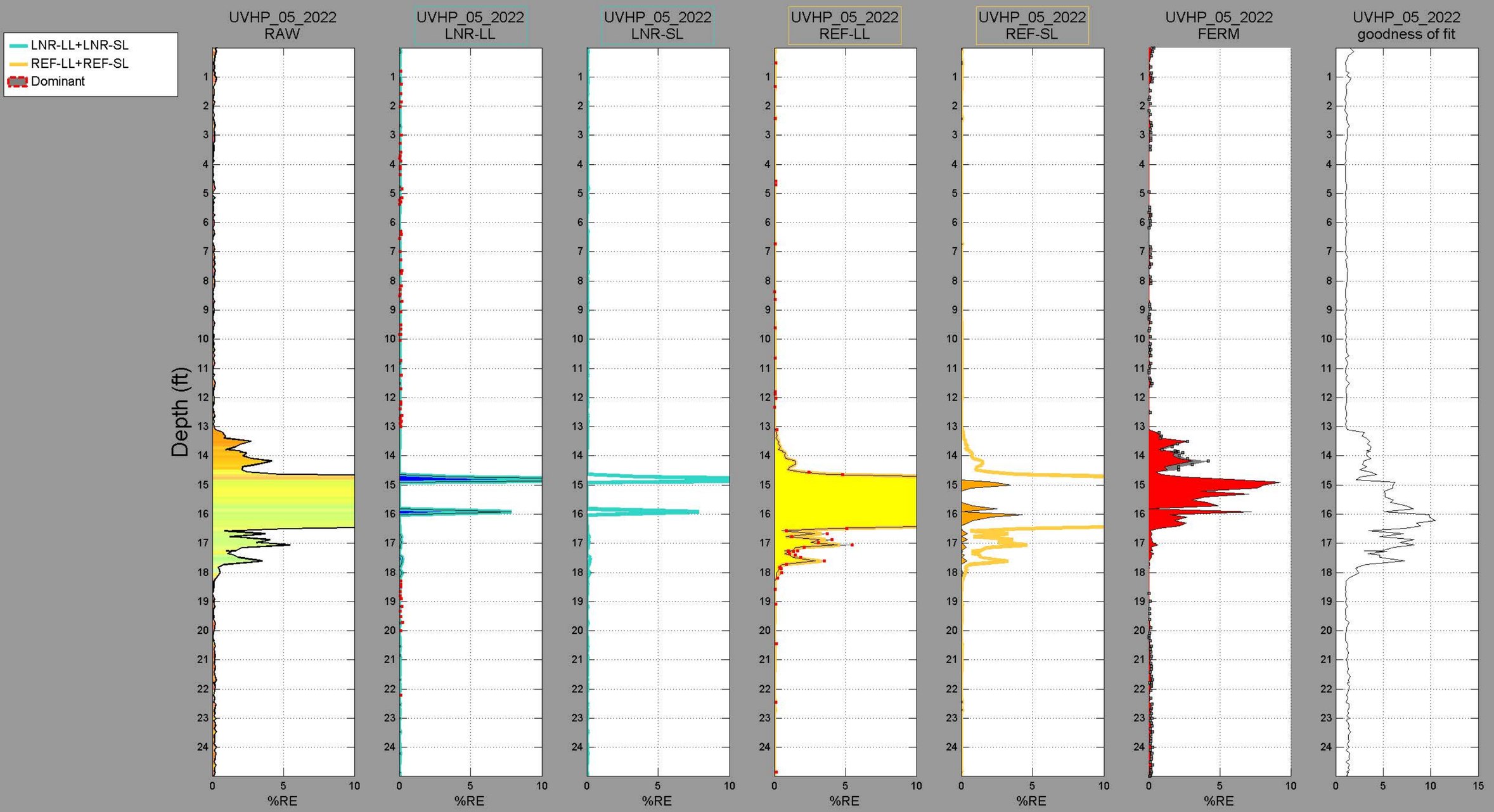


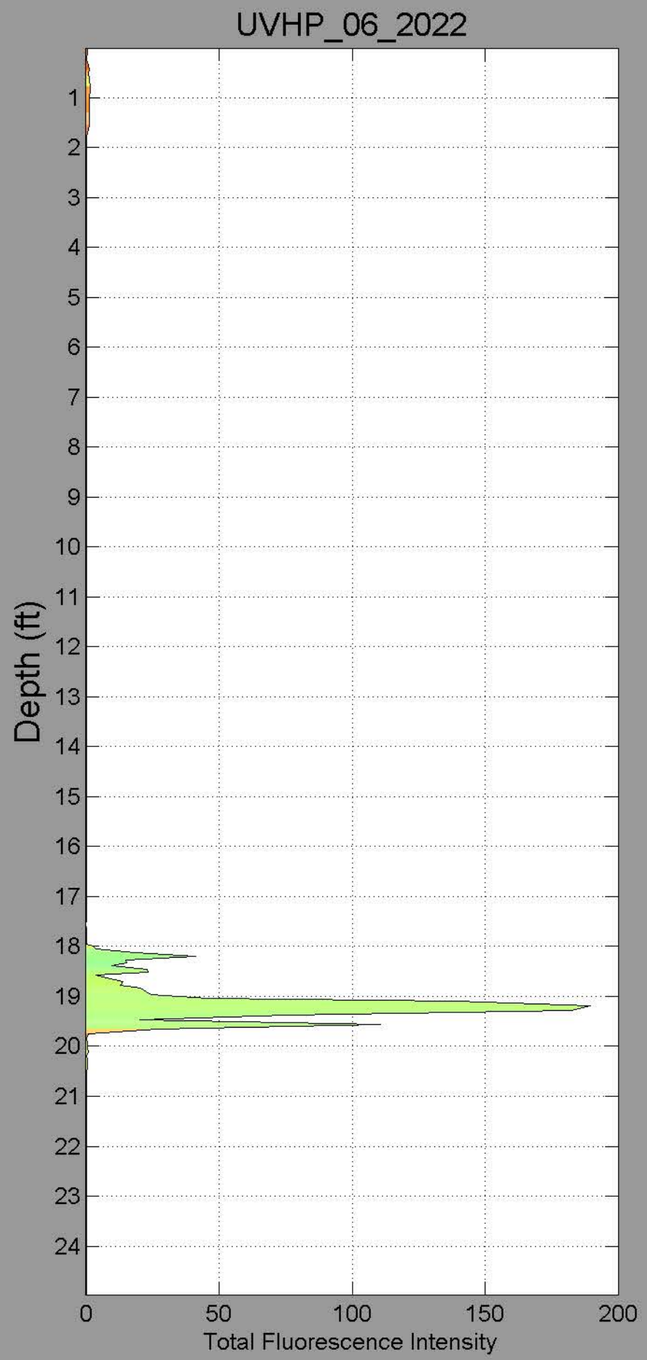




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LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_05_2022
RAW
UVHP_05_2022
LNR-LL
UVHP_05_2022
LNR-SL
UVHP_05_2022
REF-LL
UVHP_05_2022
REF-SL
UVHP_05_2022
FERM
UVHP_05_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
%RE
%RE
%RE
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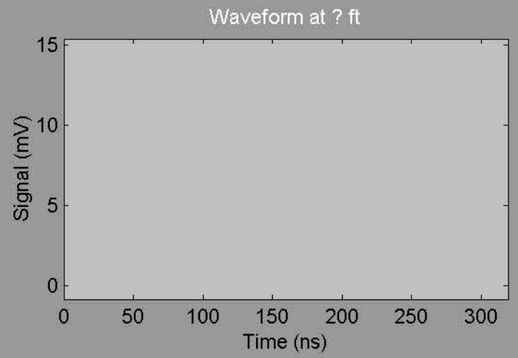

LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_05_2022
RAW
UVHP_05_2022
LNR-LL
UVHP_05_2022
LNR-SL
UVHP_05_2022
REF-LL
UVHP_05_2022
REF-SL
UVHP_05_2022
FERM
UVHP_05_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
%RE
%RE
%RE



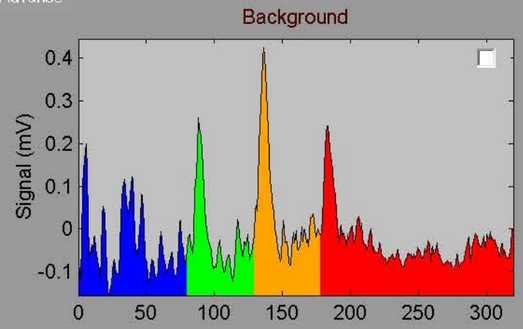
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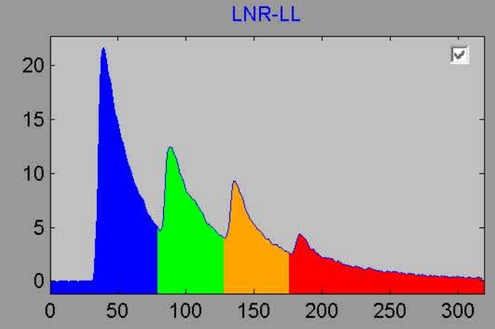
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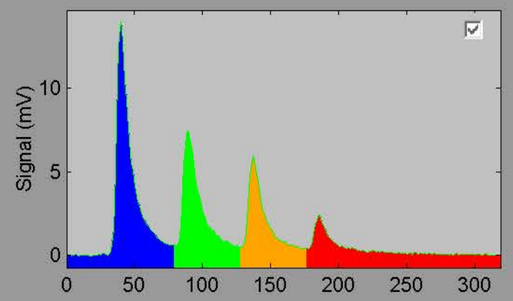
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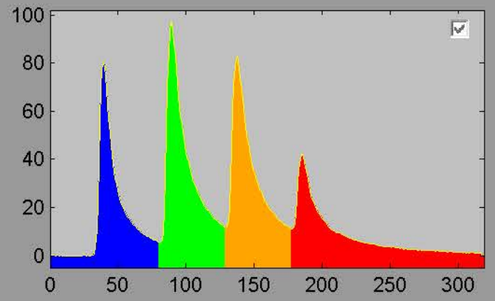


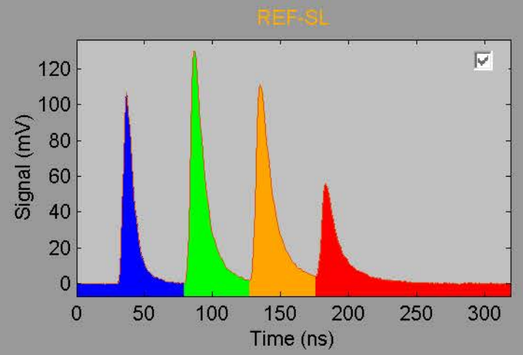


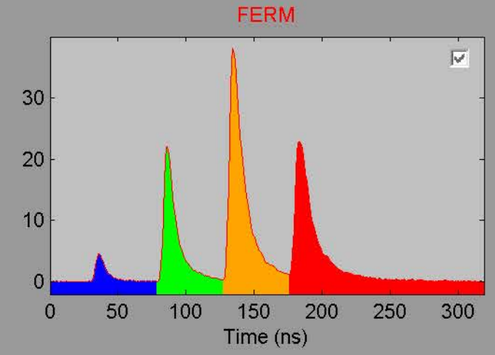




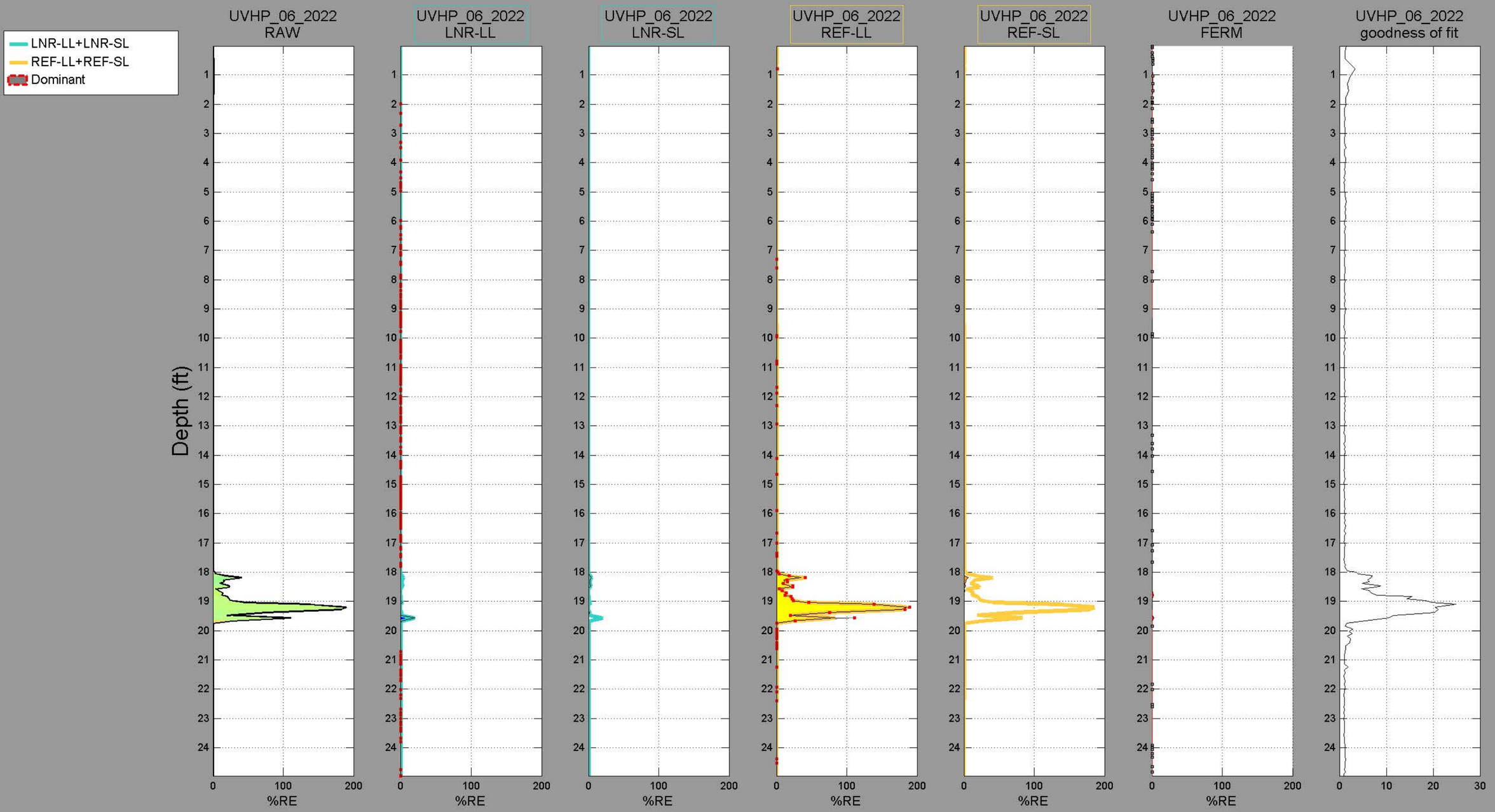


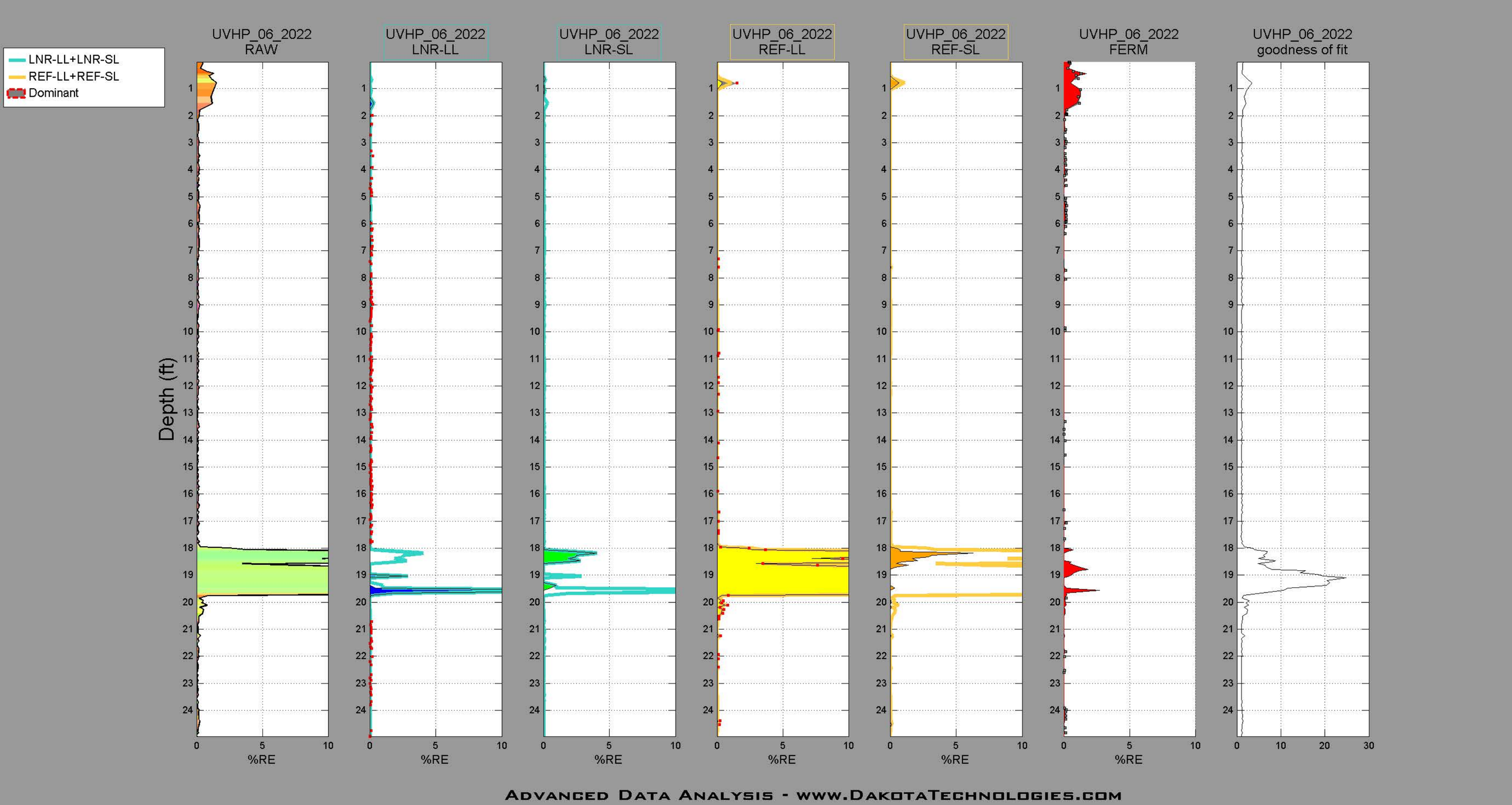


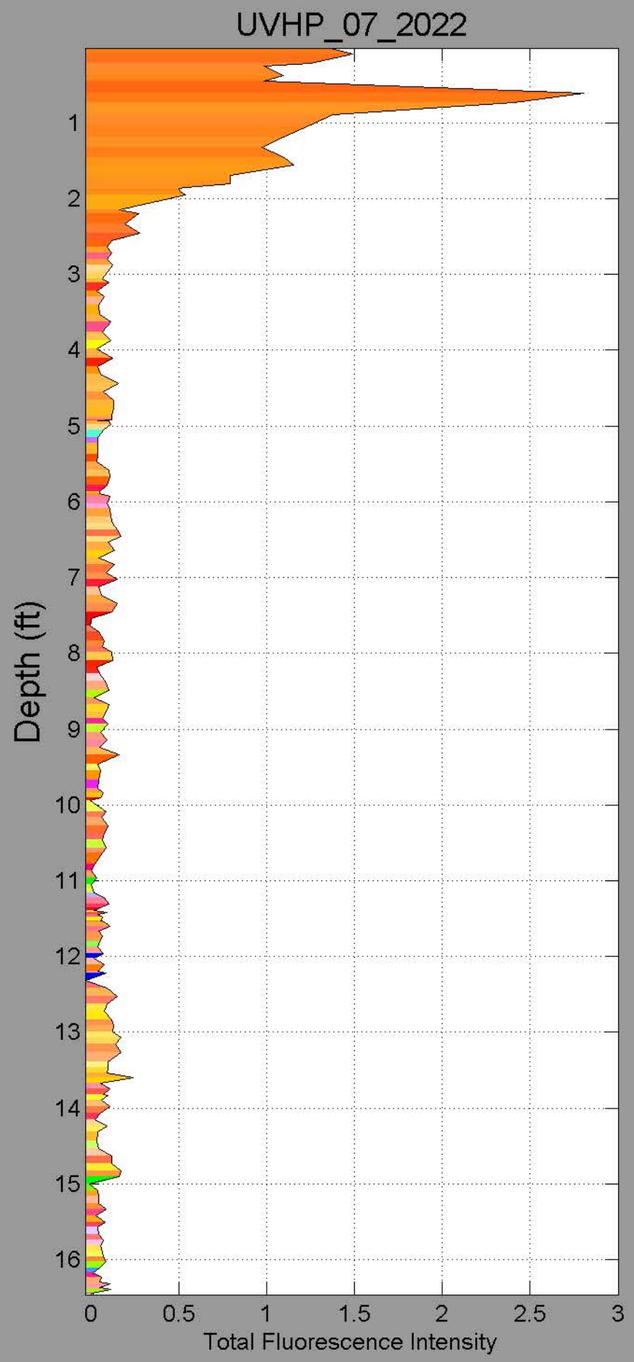




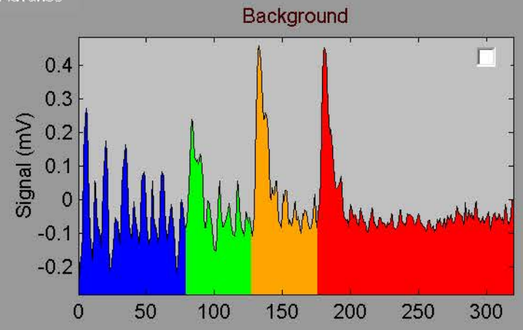
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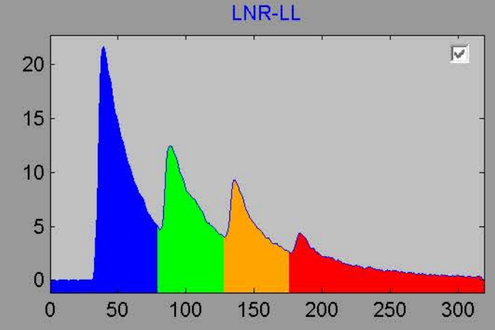

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Dominant
UVHP_06_2022
RAW
UVHP_06_2022
LNR-LL
UVHP_06_2022
LNR-SL
UVHP_06_2022
REF-LL
UVHP_06_2022
REF-SL
UVHP_06_2022
FERM
UVHP_06_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
%RE
%RE
%RE


LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_06_2022
RAW
UVHP_06_2022
LNR-LL
UVHP_06_2022
LNR-SL
UVHP_06_2022
REF-LL
UVHP_06_2022
REF-SL
UVHP_06_2022
FERM
UVHP_06_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
%RE
%RE
%RE
ADVANCED DATA ANALYSIS - WWW.DAKOTATECHNOLOGIES.COM

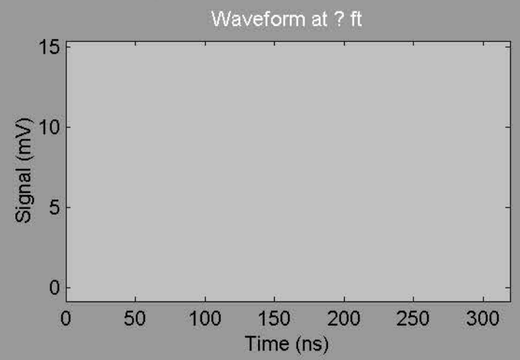


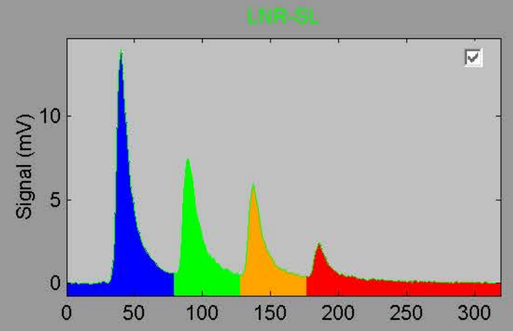
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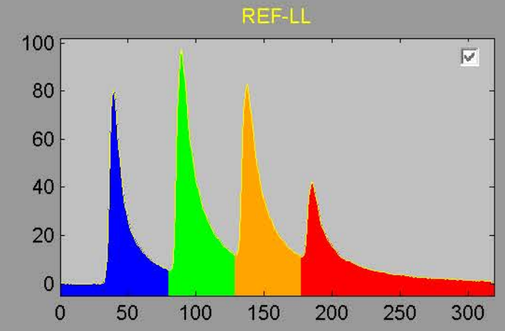




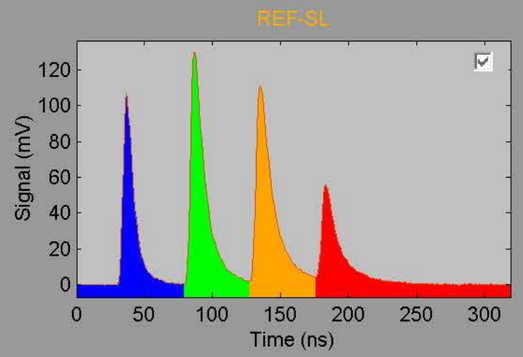
auto bkgd subtract NNLS on load

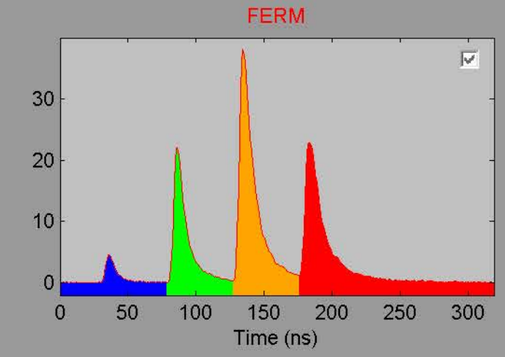




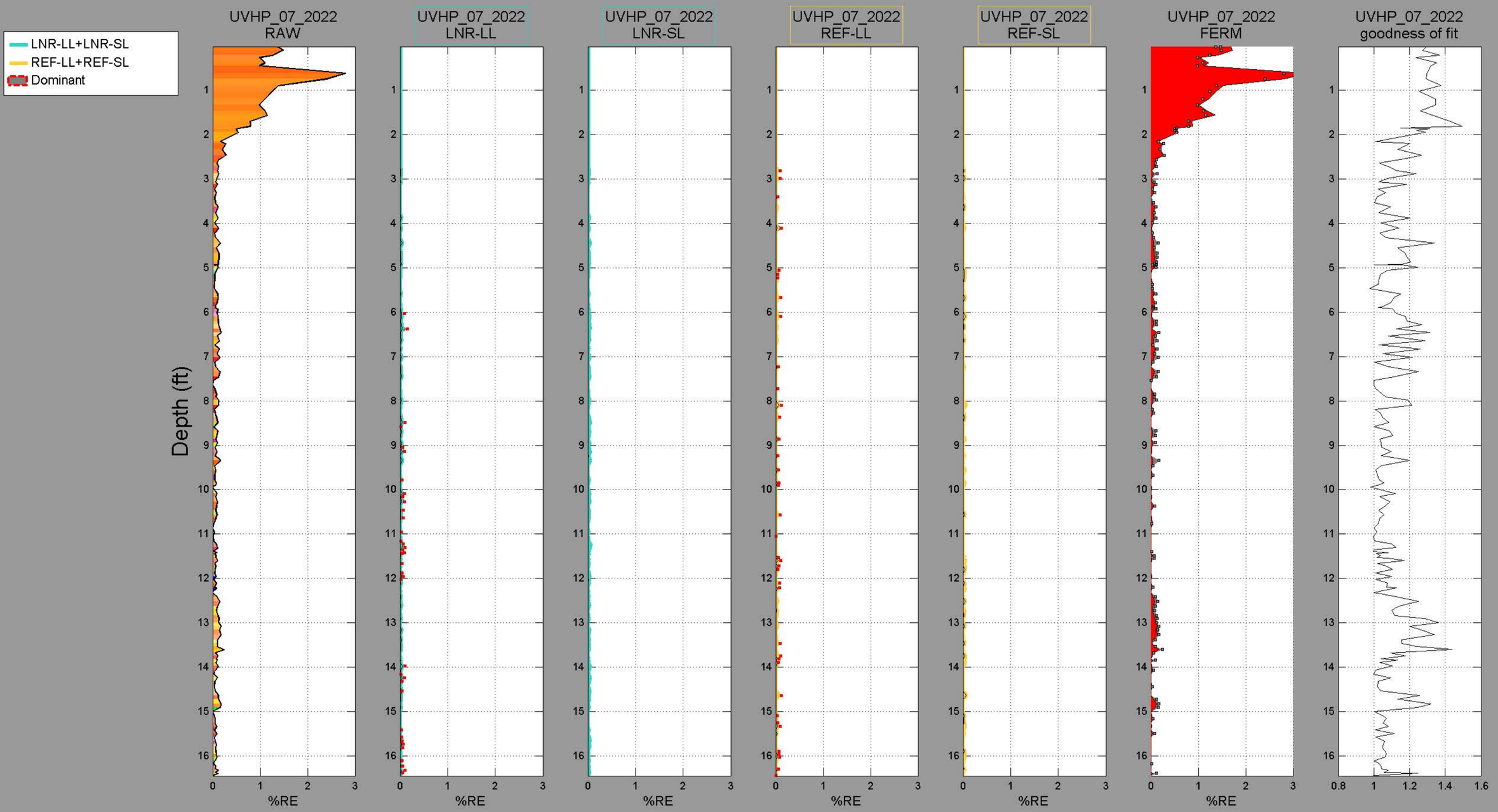


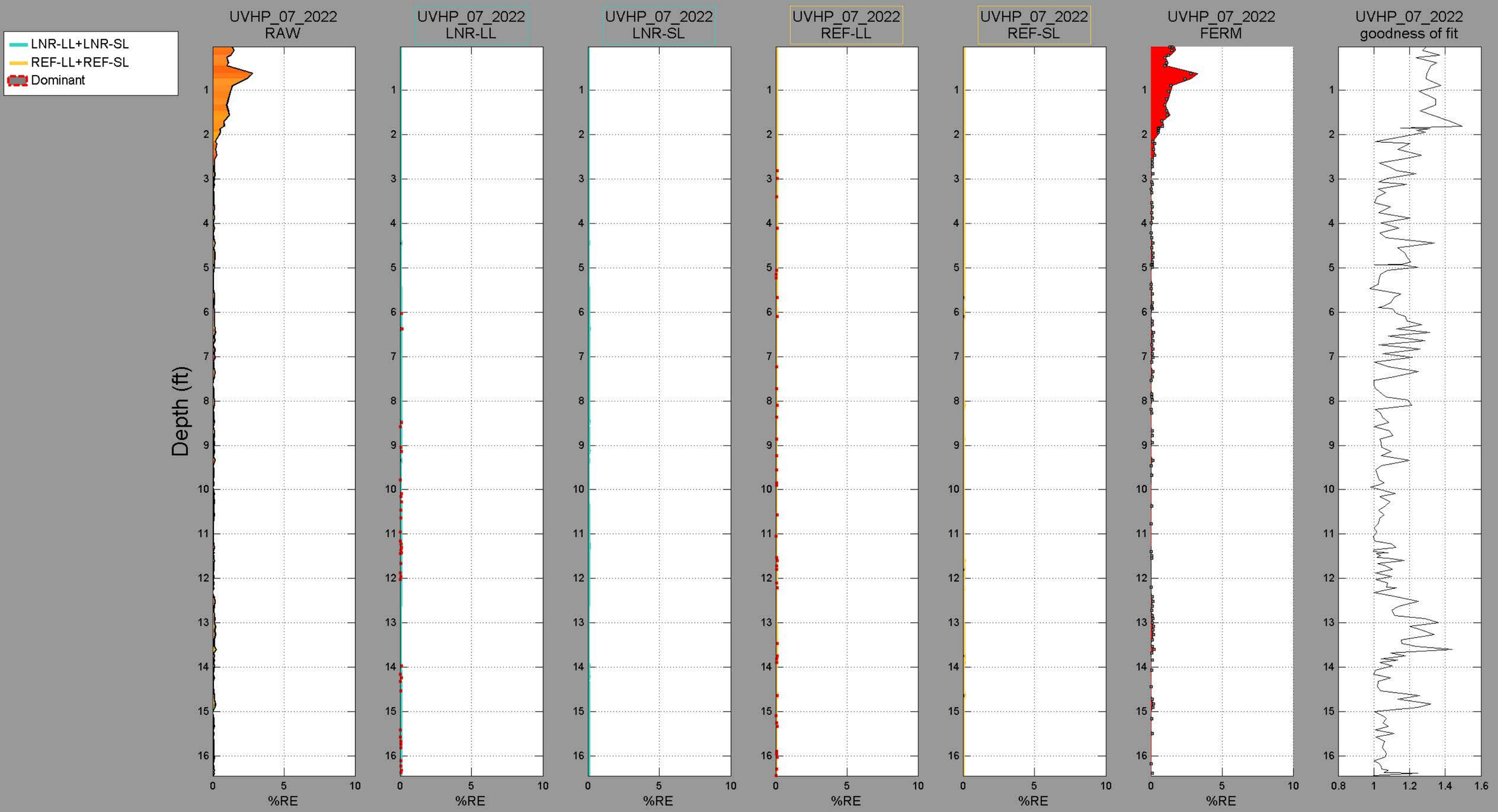




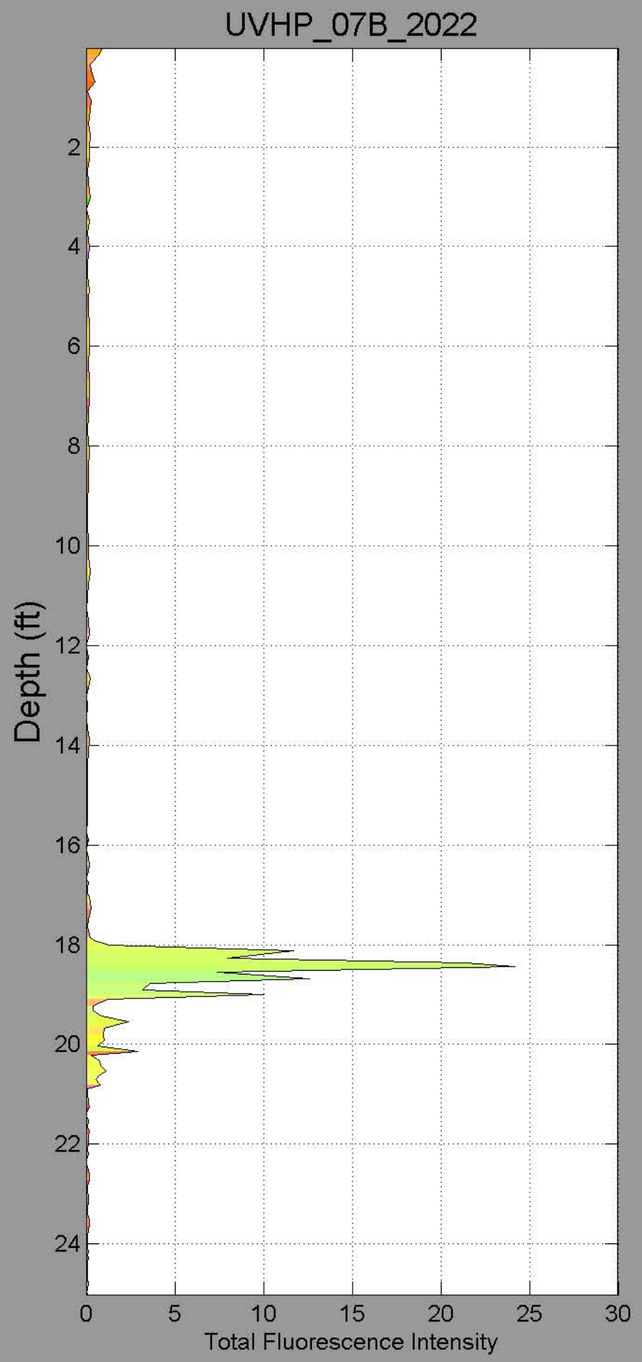


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LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_07_2022
RAW
UVHP_07_2022
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UVHP_07_2022
LNR-SL
UVHP_07_2022
REF-LL
UVHP_07_2022
REF-SL
UVHP_07_2022
FERM
UVHP_07_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
%RE
%RE
0.8
1
1.2
1.4
1.6



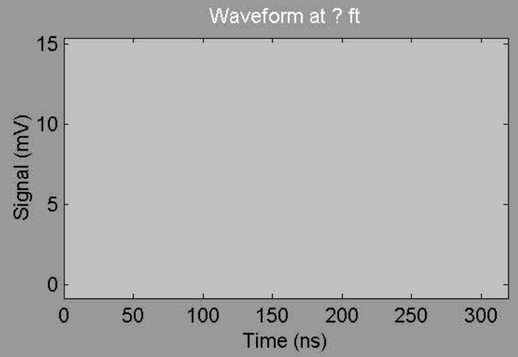
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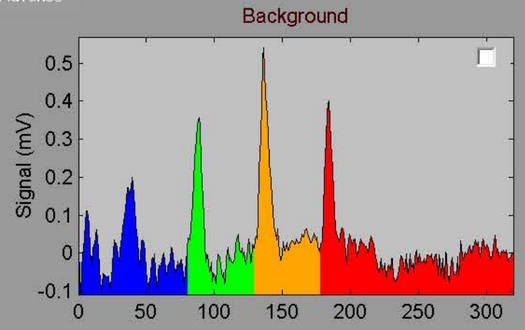
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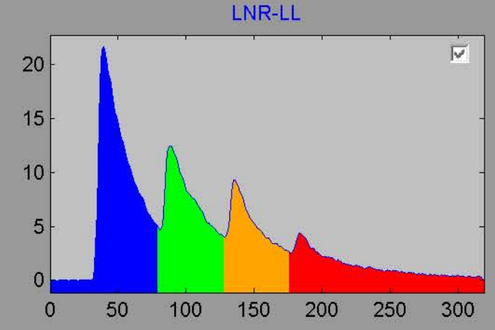
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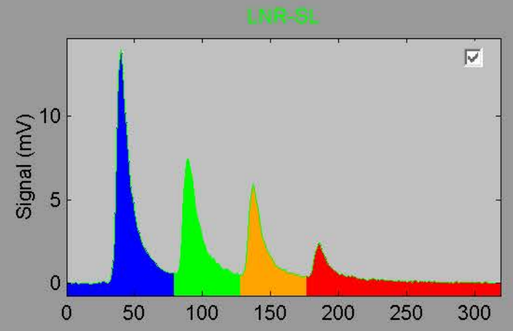
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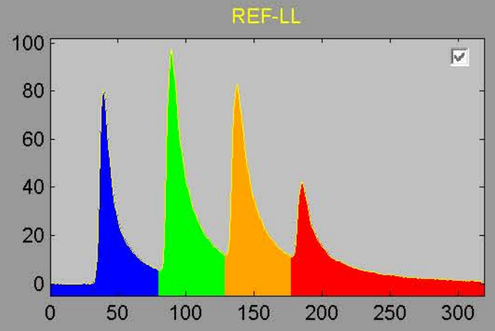


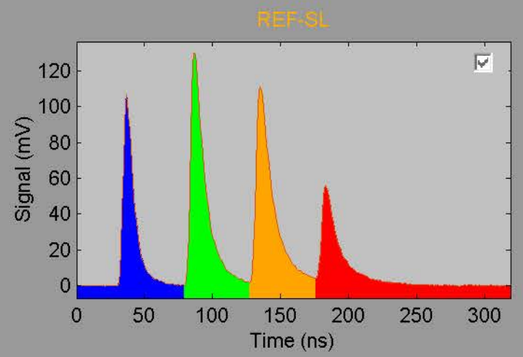


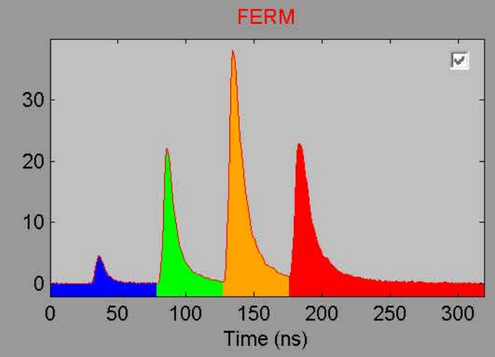




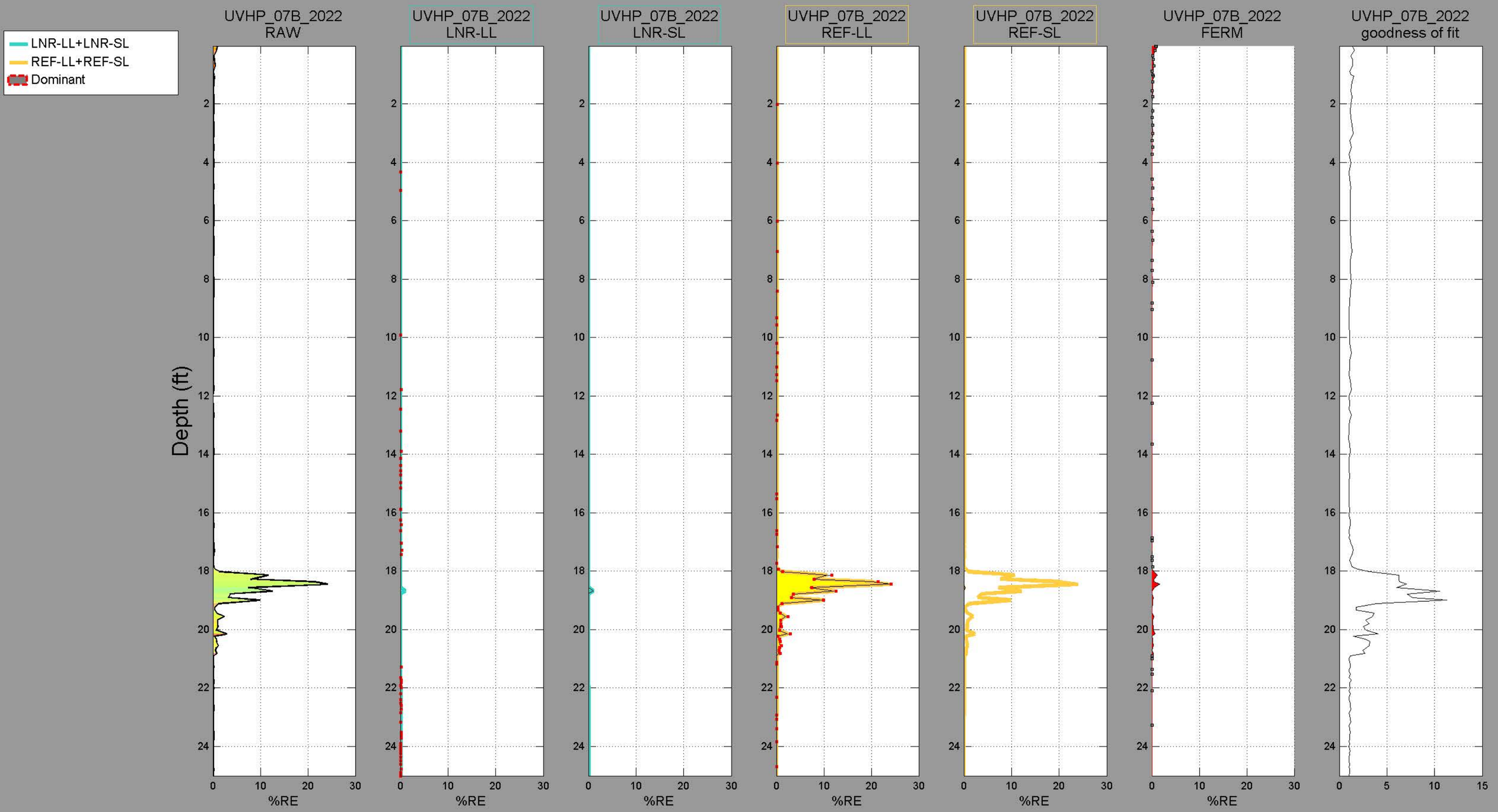


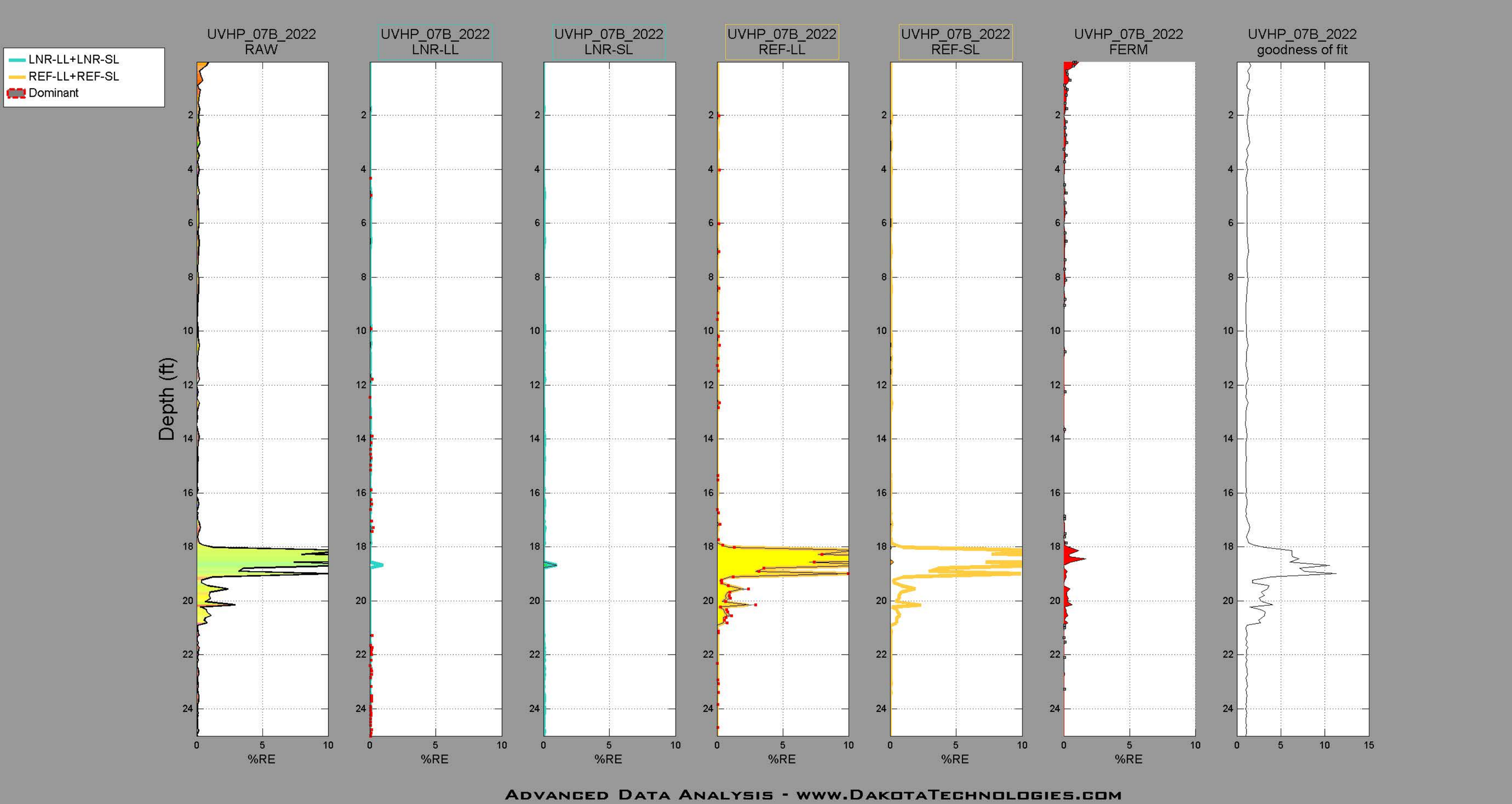


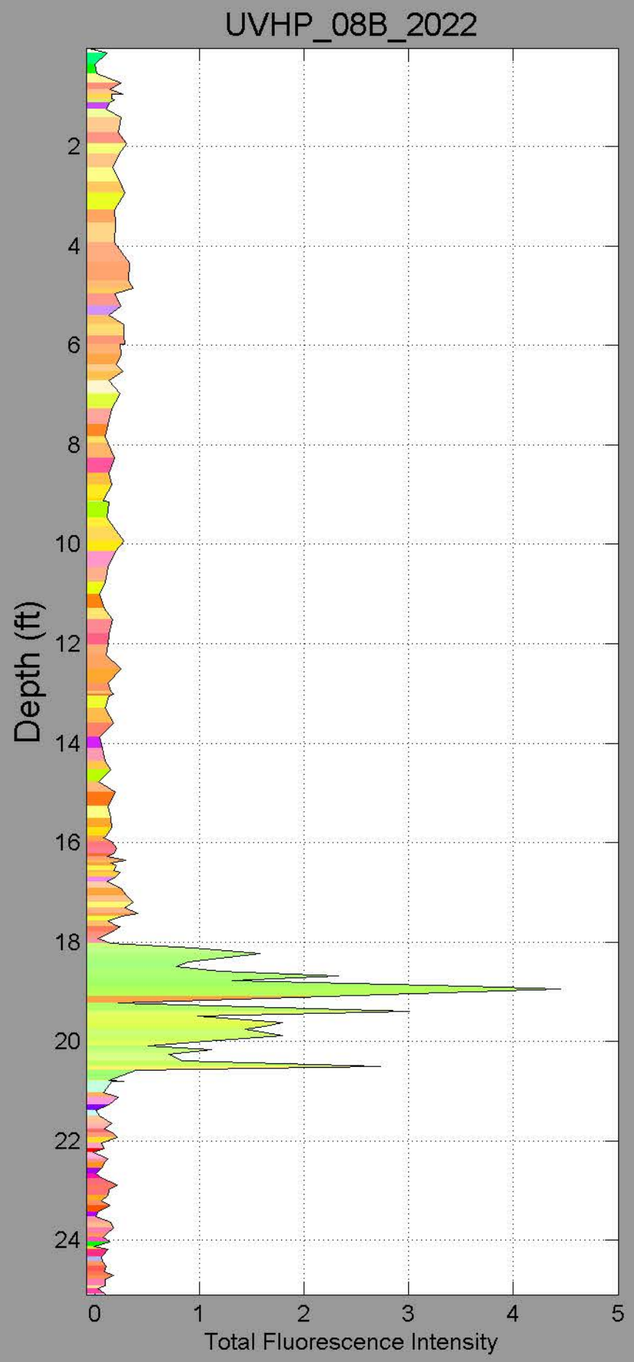




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LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_07B_2022
RAW
UVHP_07B_2022
LNR-LL
UVHP_07B_2022
LNR-SL
UVHP_07B_2022
REF-LL
UVHP_07B_2022
REF-SL
UVHP_07B_2022
FERM
UVHP_07B_2022
goodness of fit
Depth (ft)
%RE
ADVANCED DATA ANALYSIS - WWW.DAKOTATECHNOLOGIES.COM

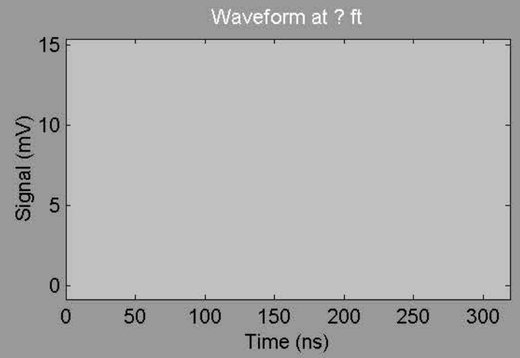

LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_07B_2022
RAW
UVHP_07B_2022
LNR-LL
UVHP_07B_2022
LNR-SL
UVHP_07B_2022
REF-LL
UVHP_07B_2022
REF-SL
UVHP_07B_2022
FERM
UVHP_07B_2022
goodness of fit
Depth (ft)
%RE
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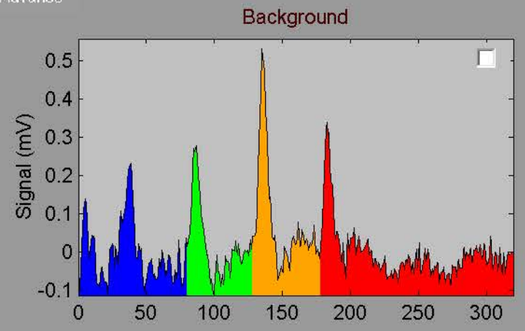
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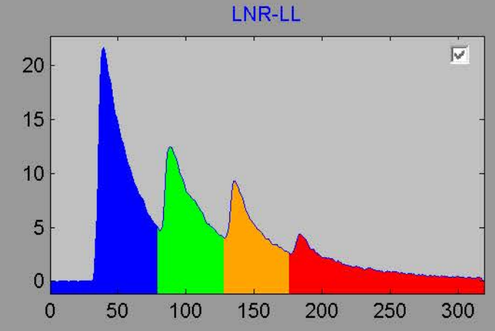
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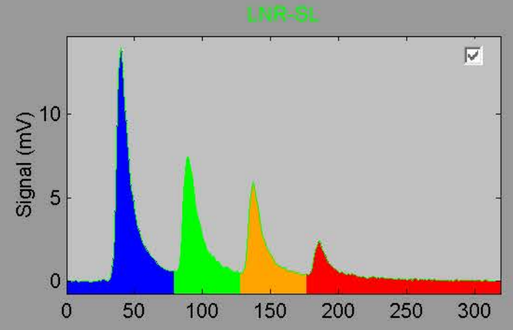
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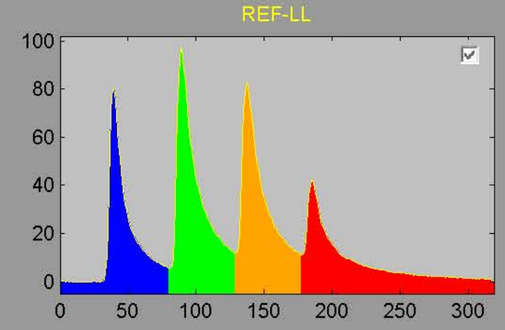


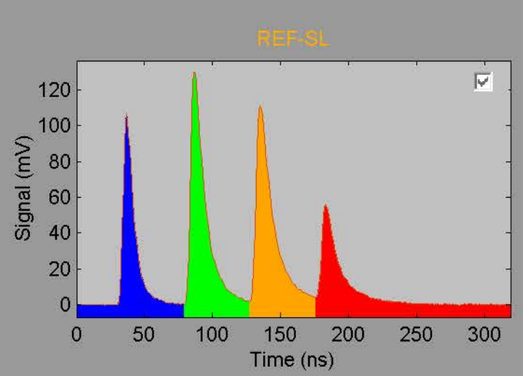


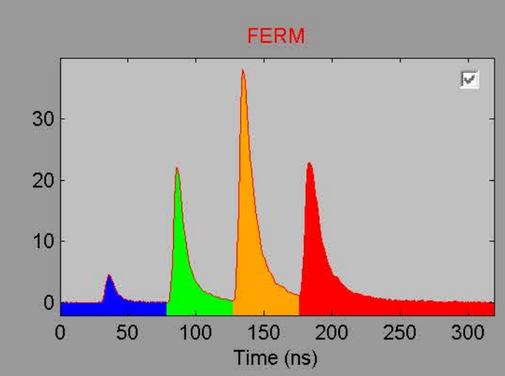




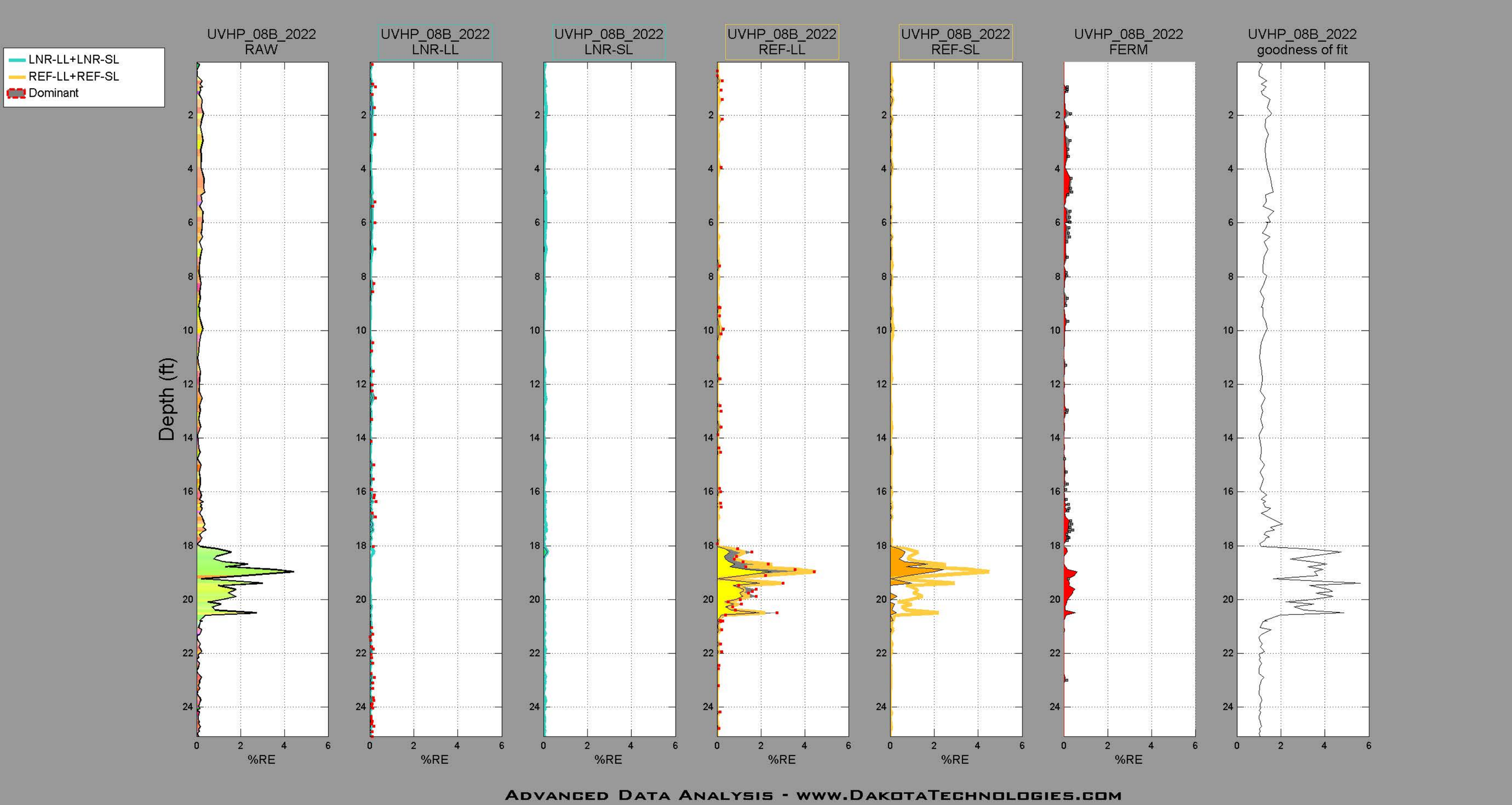


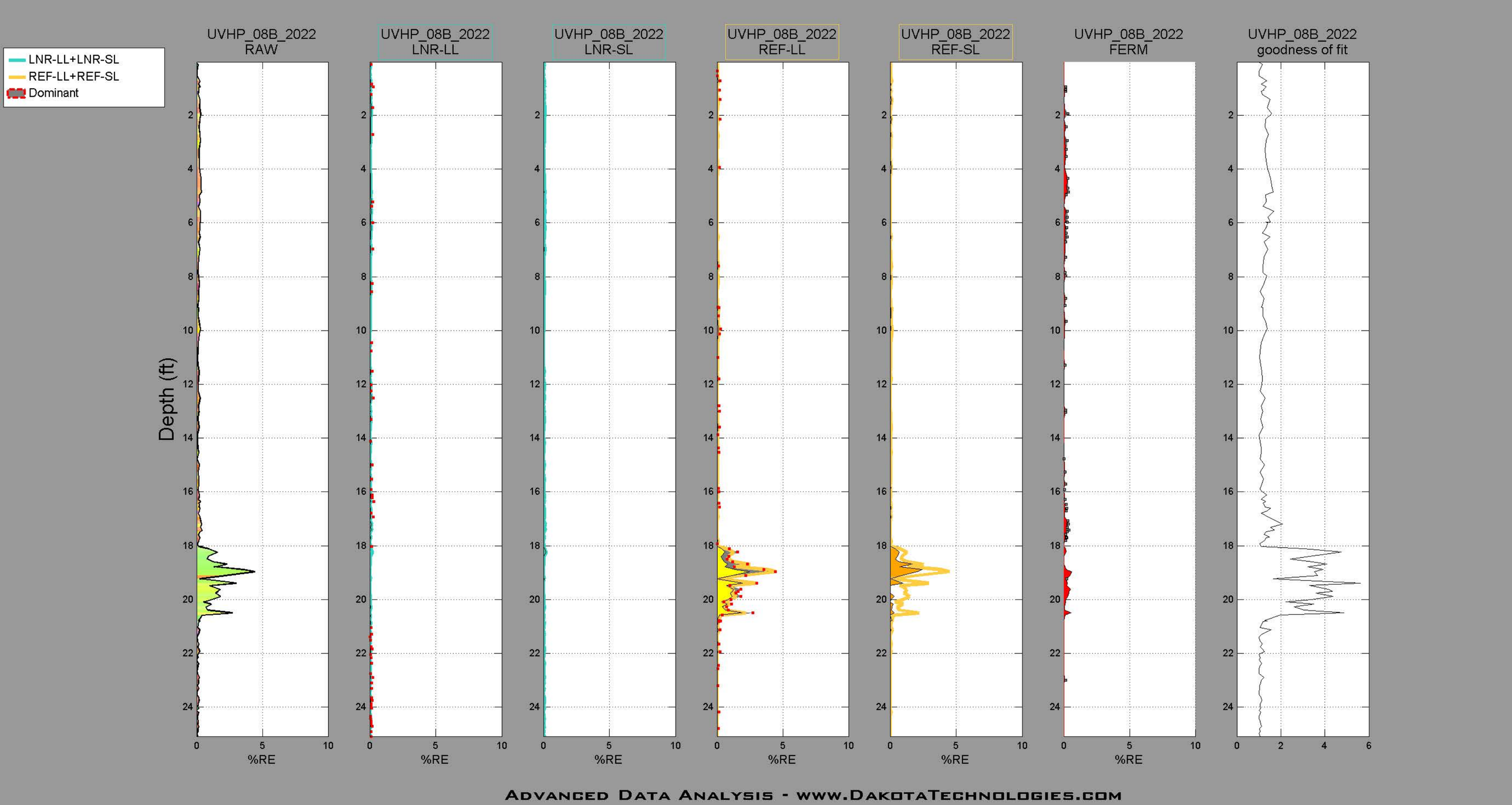


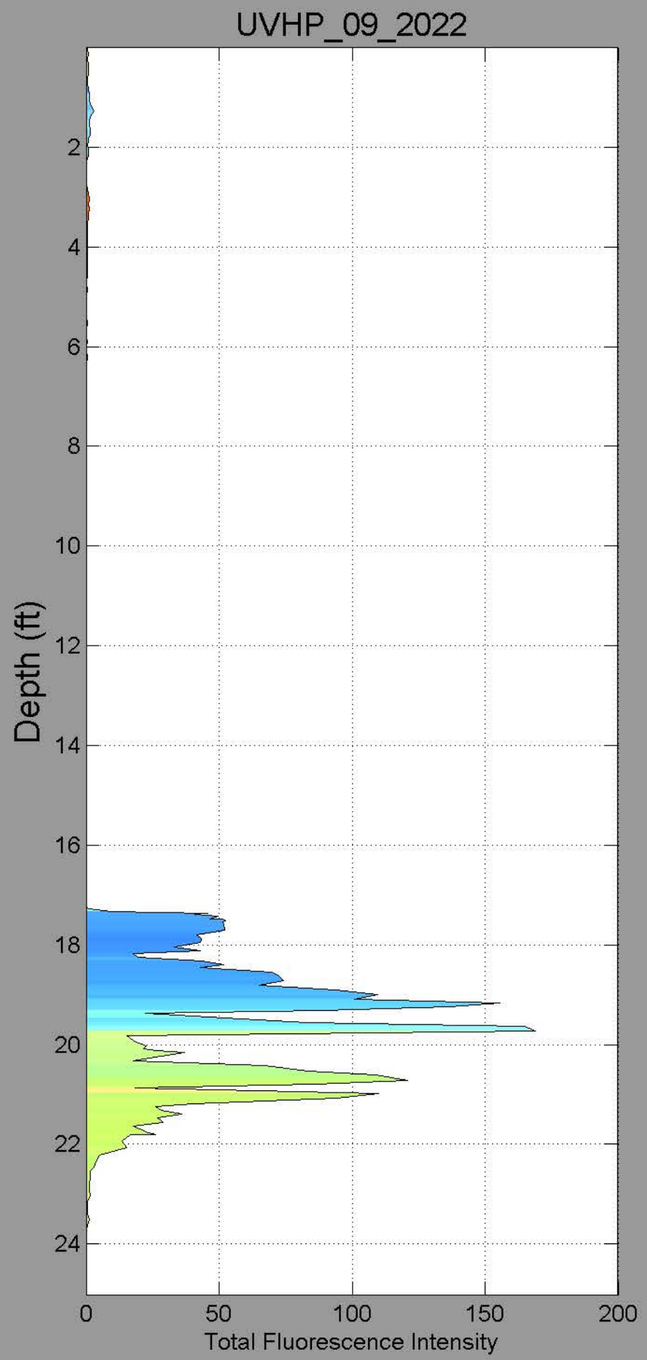




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LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_08B_2022
RAW
UVHP_08B_2022
LNR-LL
UVHP_08B_2022
LNR-SL
UVHP_08B_2022
REF-LL
UVHP_08B_2022
REF-SL
UVHP_08B_2022
FERM
UVHP_08B_2022
goodness of fit
Depth (ft)
%RE
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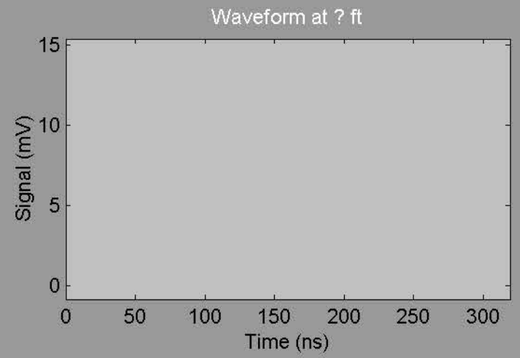

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REF-LL+REF-SL
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UVHP_08B_2022
LNR-LL
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LNR-SL
UVHP_08B_2022
REF-LL
UVHP_08B_2022
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FERM
UVHP_08B_2022
goodness of fit
Depth (ft)
%RE
Advanced Data Analysis - www.DakotaTechnologies.com



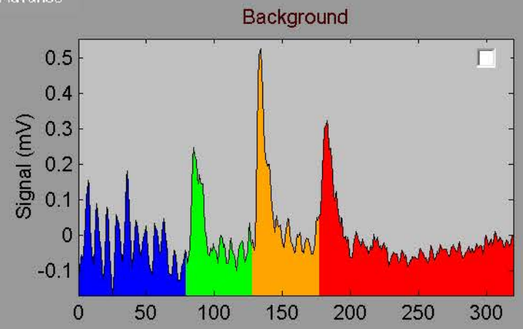
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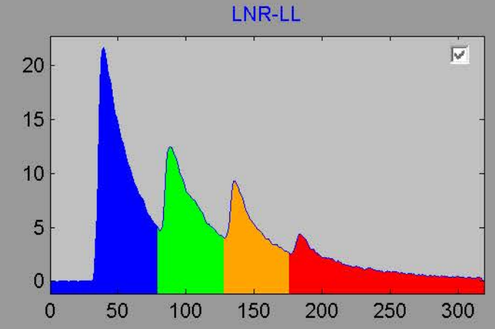
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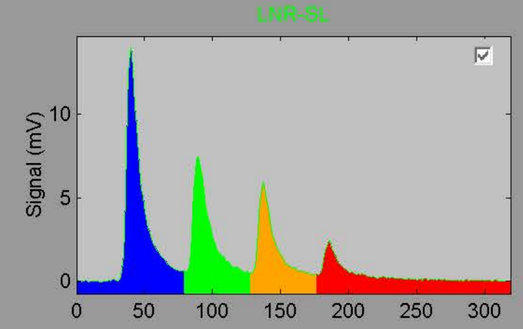
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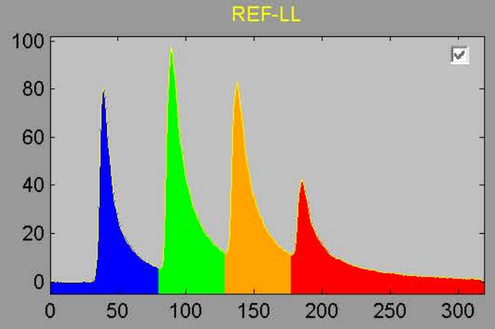


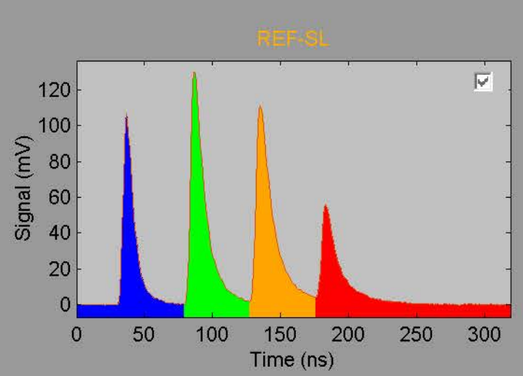


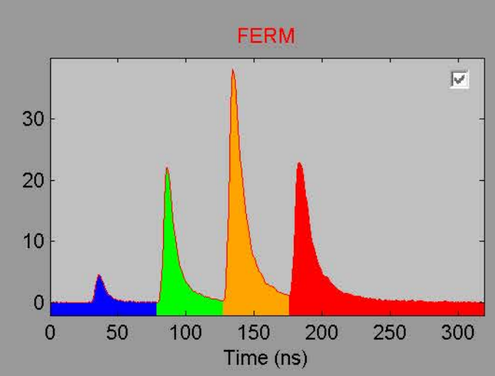




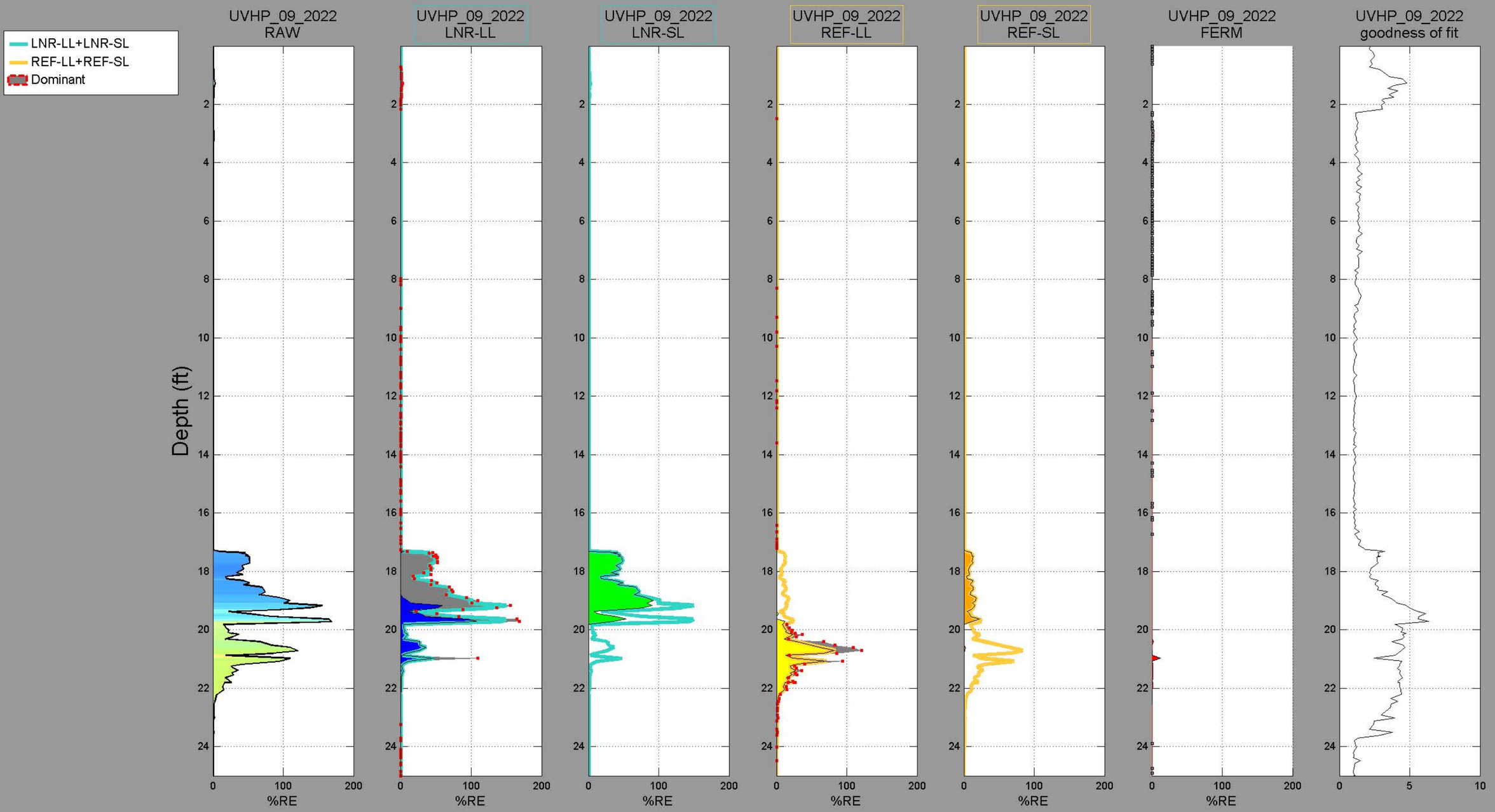




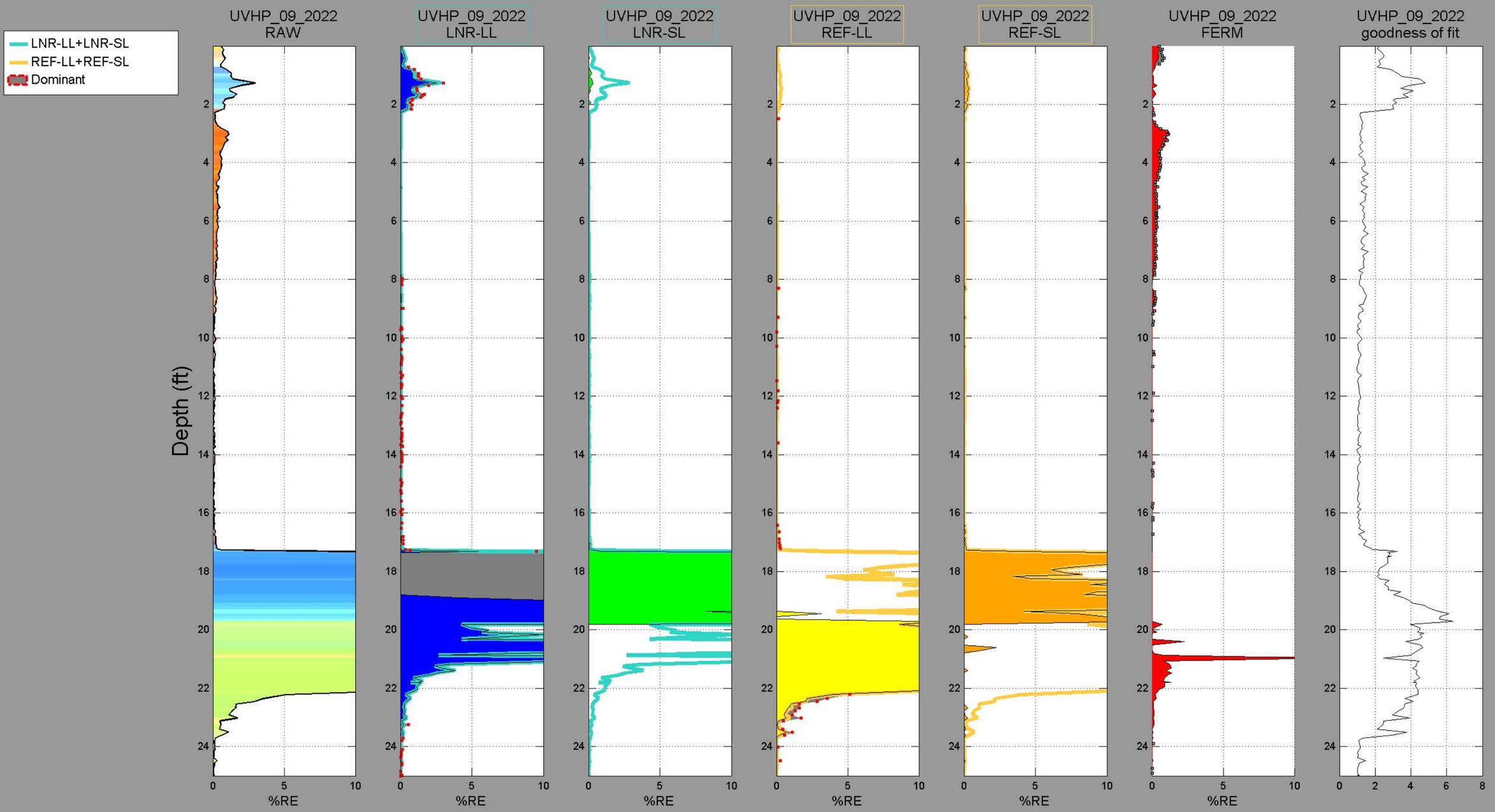


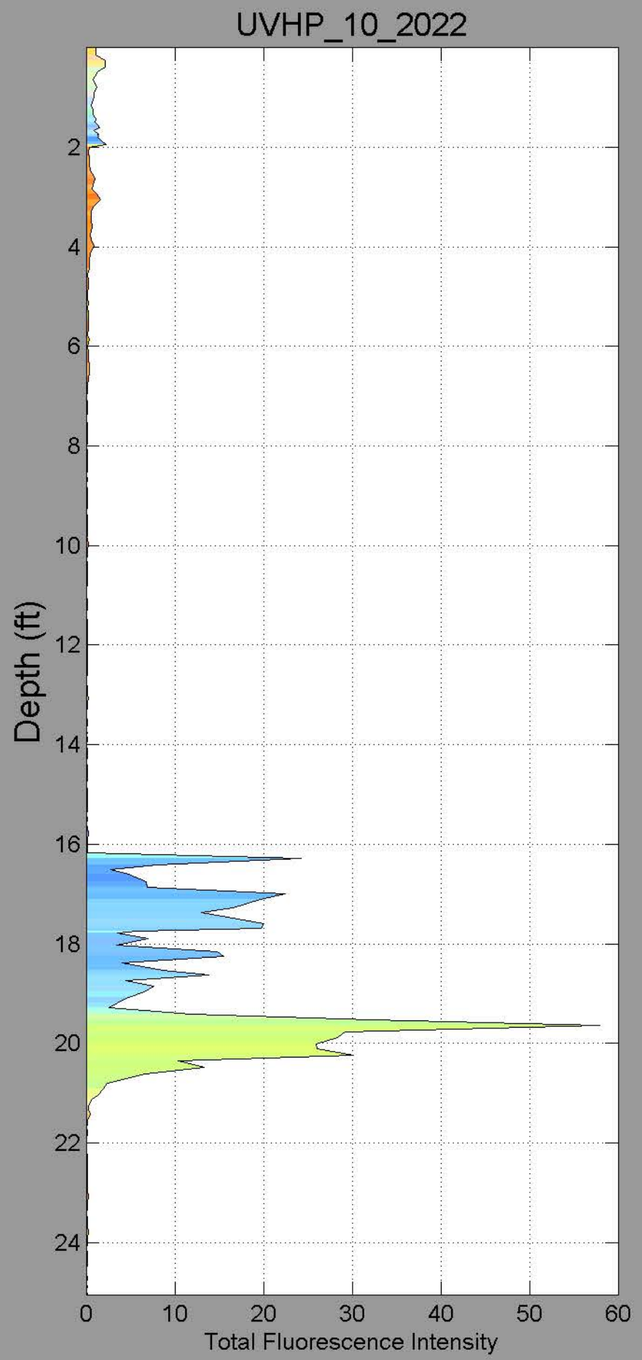


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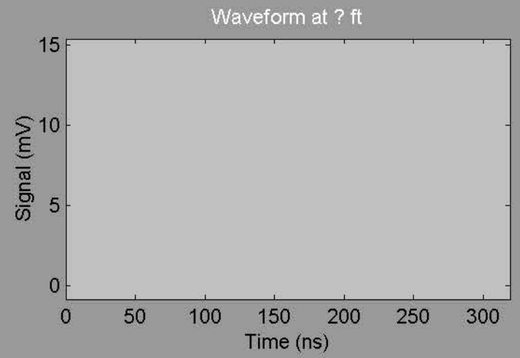

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REF-LL+REF-SL
Dominant
UVHP_09_2022
RAW
UVHP_09_2022
LNR-LL
UVHP_09_2022
LNR-SL
UVHP_09_2022
REF-LL
UVHP_09_2022
REF-SL
UVHP_09_2022
FERM
UVHP_09_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
%RE
%RE
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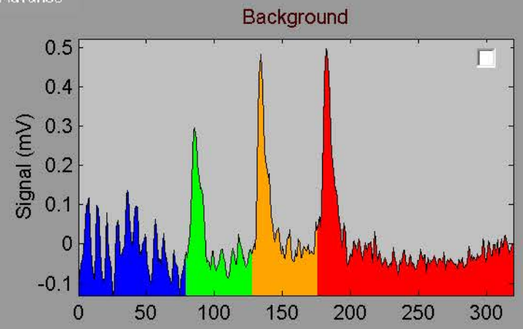
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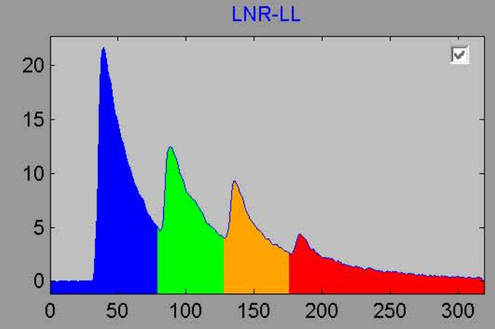
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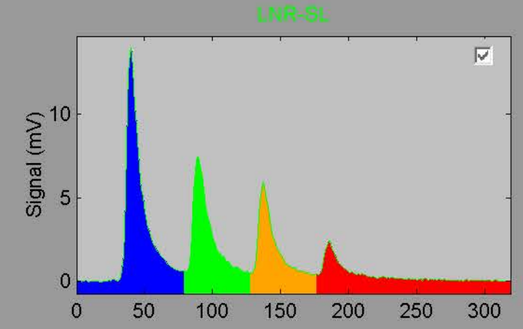
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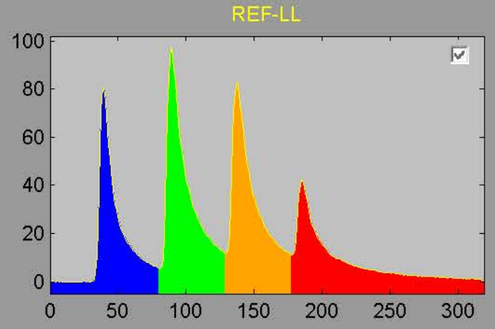


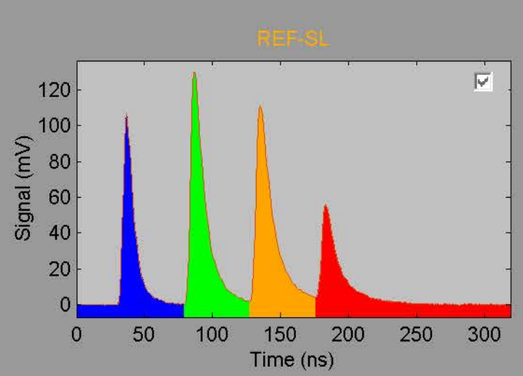


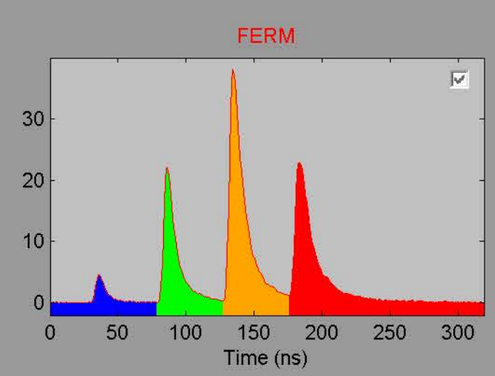




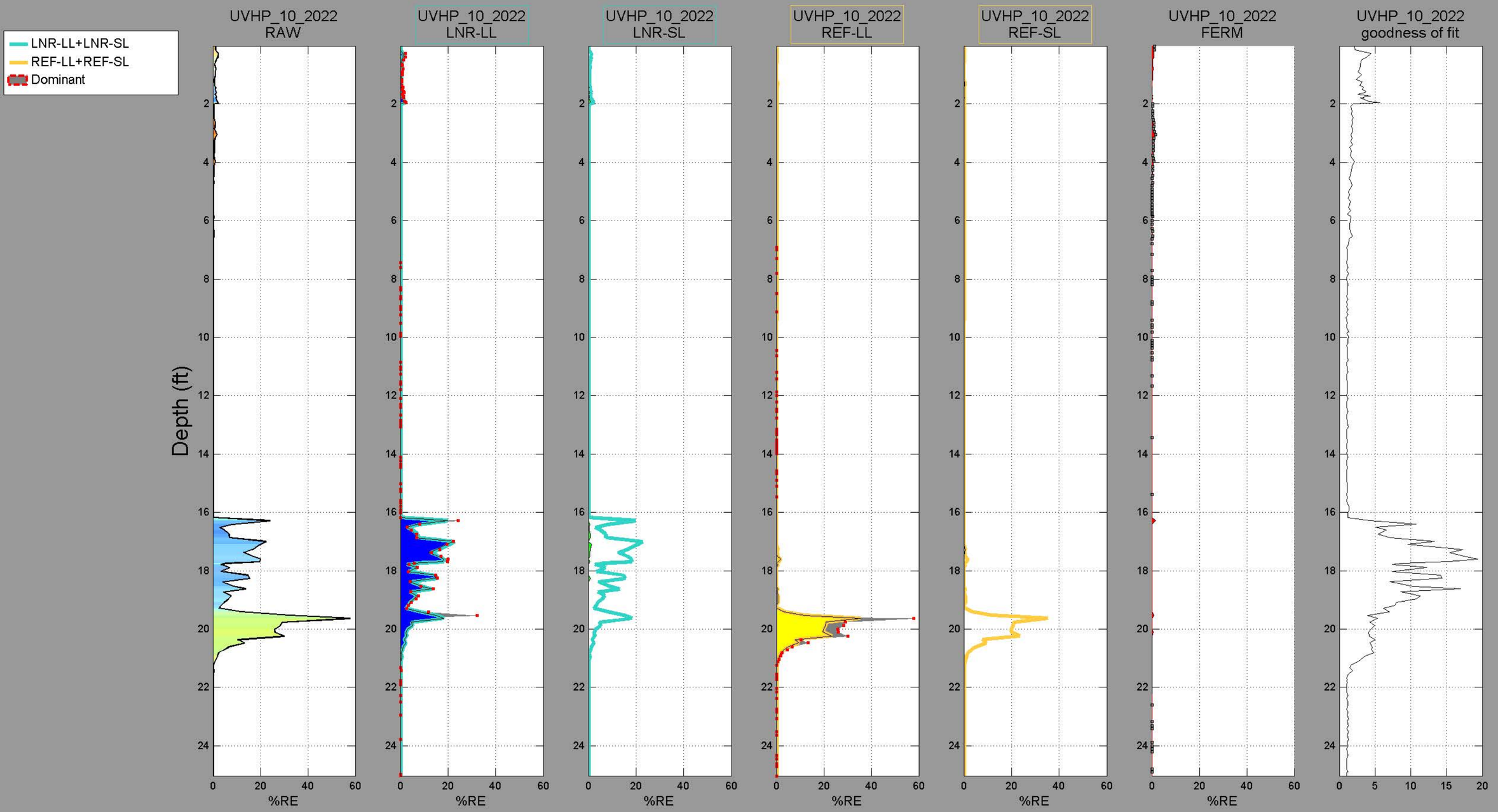




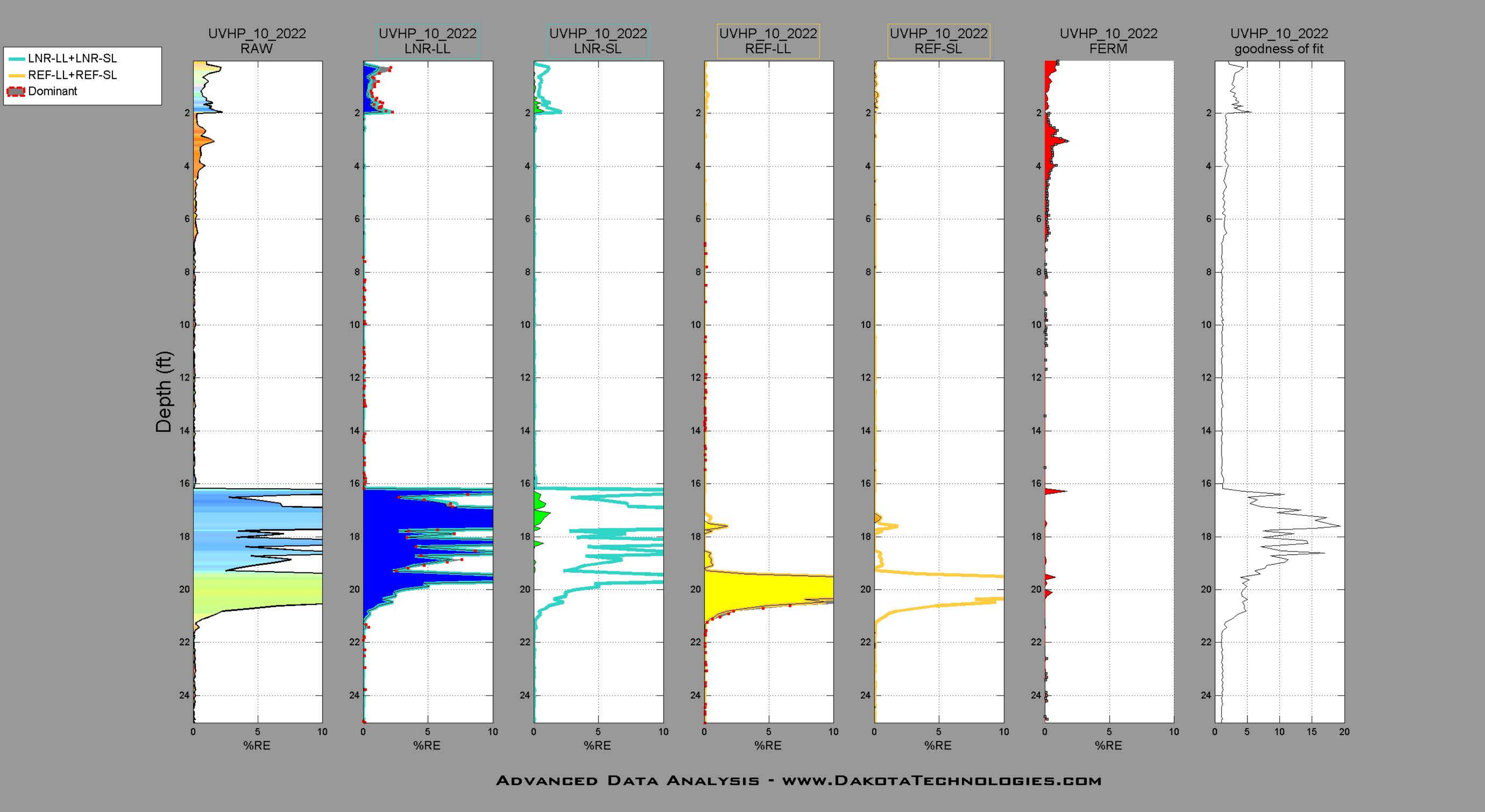


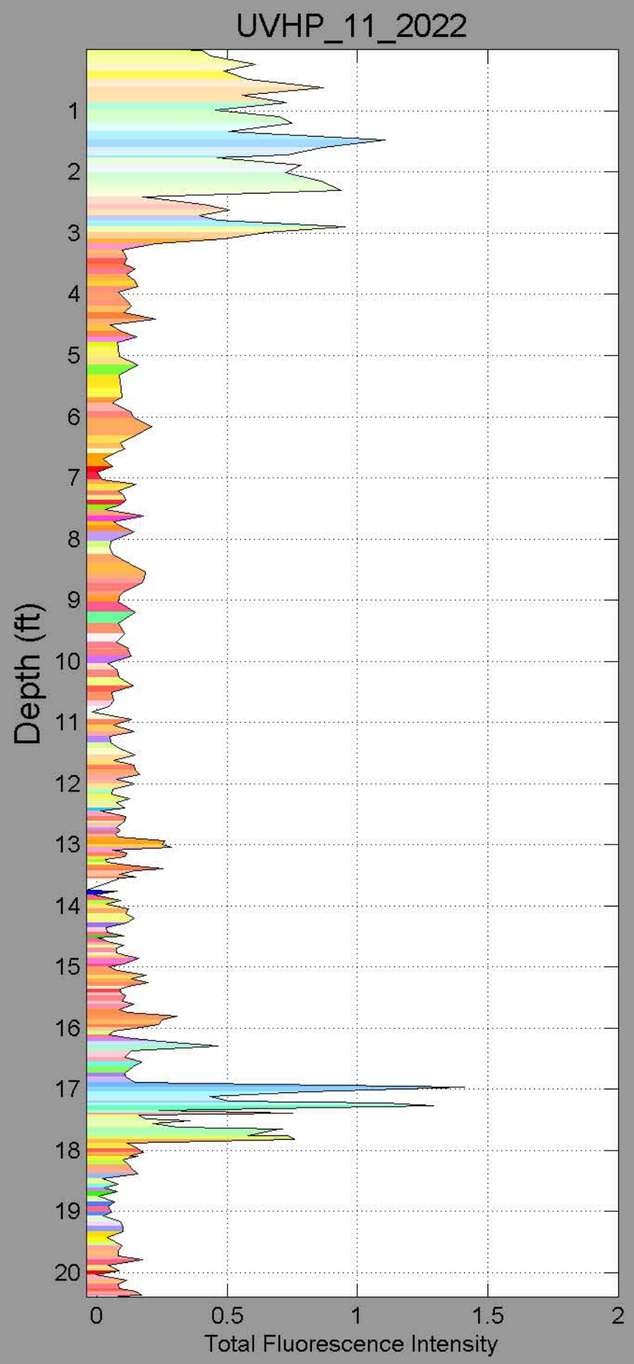


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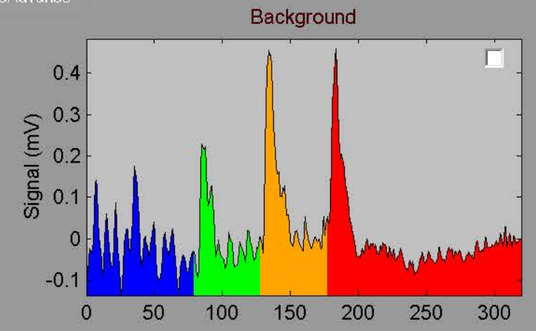


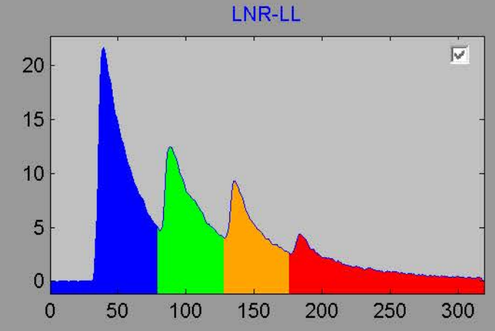
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REF-LL+REF-SL
Dominant
UVHP_10_2022
RAW
UVHP_10_2022
LNR-LL
UVHP_10_2022
LNR-SL
UVHP_10_2022
REF-LL
UVHP_10_2022
REF-SL
UVHP_10_2022
FERM
UVHP_10_2022
goodness of fit
Depth (ft)
%RE
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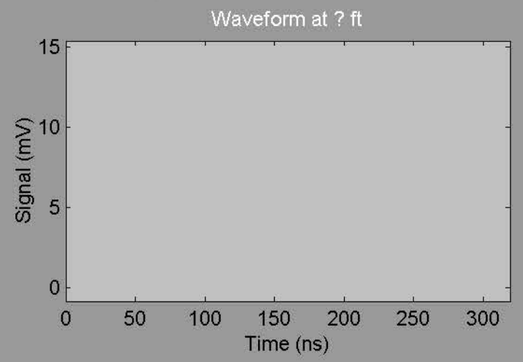


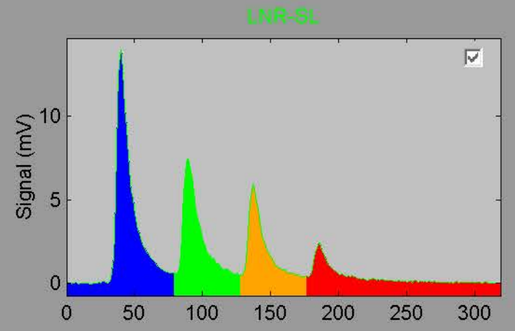
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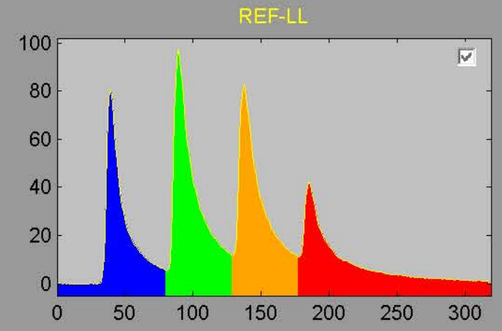




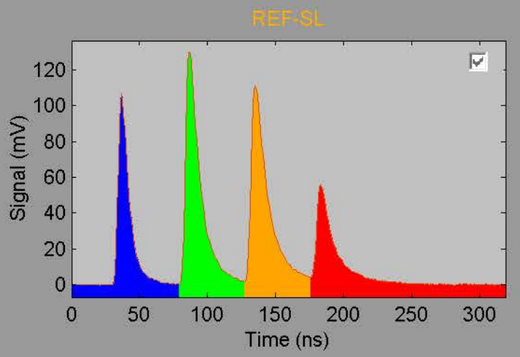
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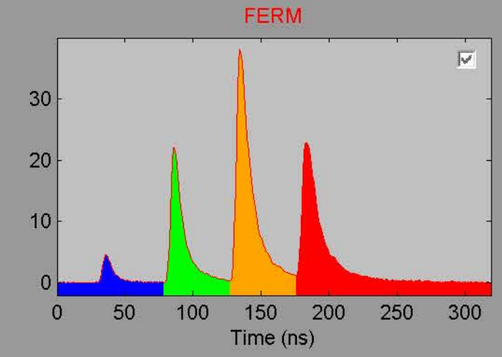




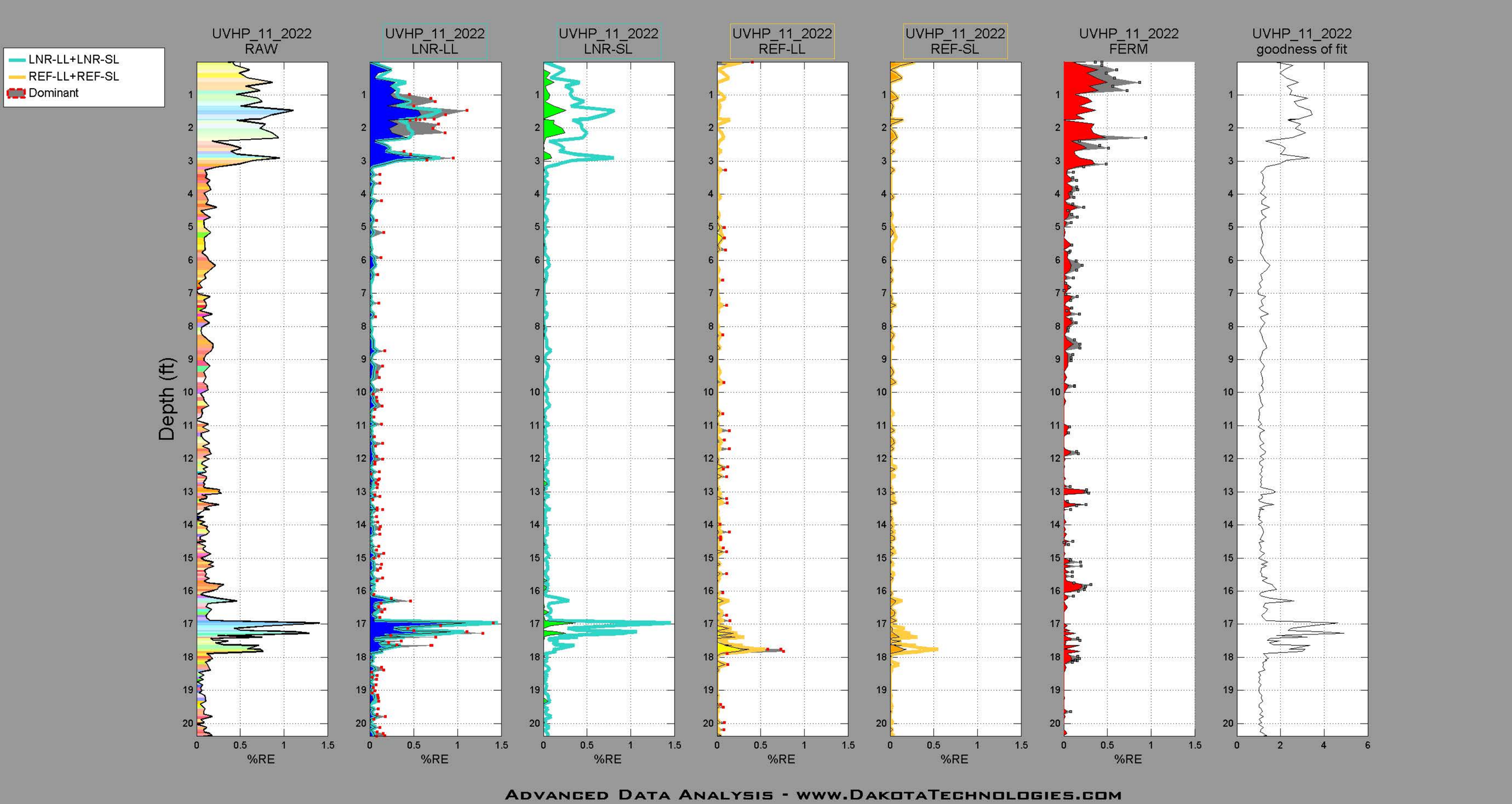


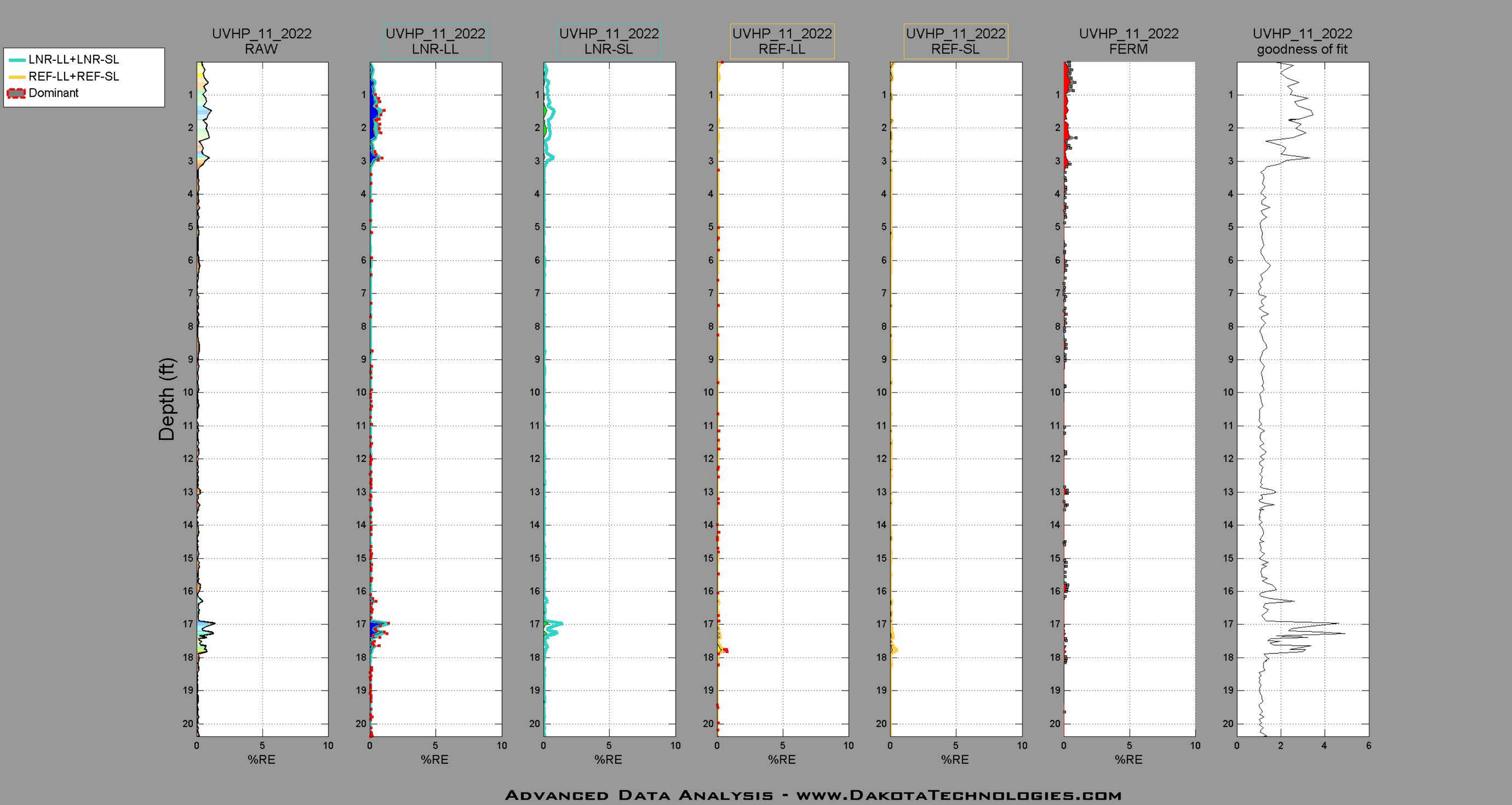


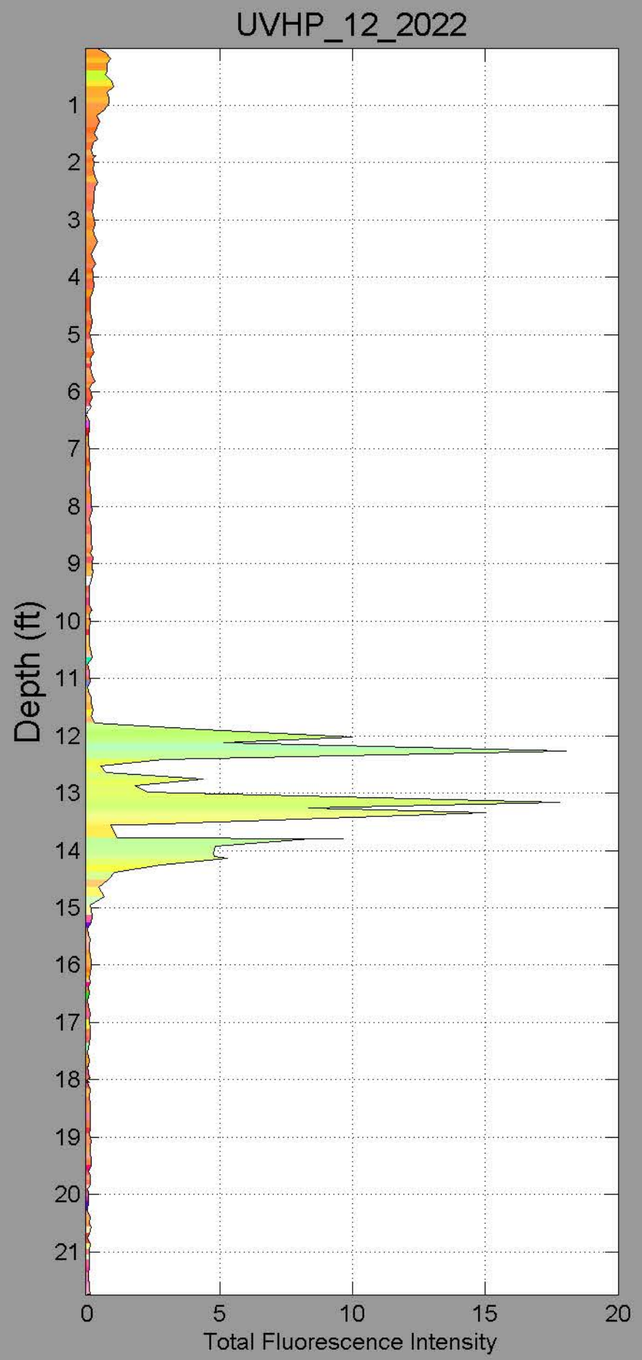




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LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_11_2022
RAW
UVHP_11_2022
LNR-LL
UVHP_11_2022
LNR-SL
UVHP_11_2022
REF-LL
UVHP_11_2022
REF-SL
UVHP_11_2022
FERM
UVHP_11_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
%RE
%RE
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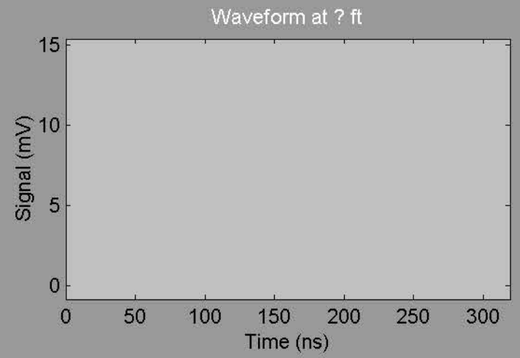

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REF-LL+REF-SL
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UVHP_11_2022
LNR-LL
UVHP_11_2022
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FERM
UVHP_11_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
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%RE
%RE
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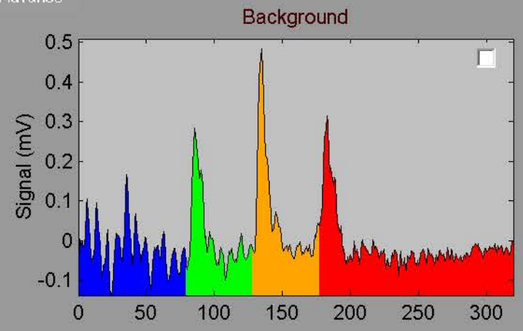
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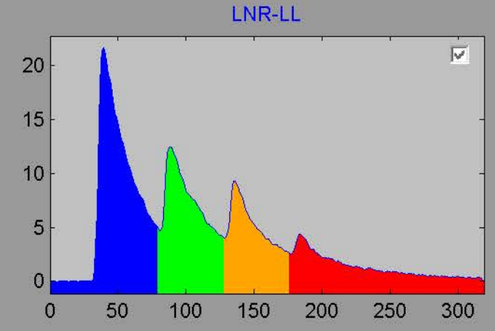
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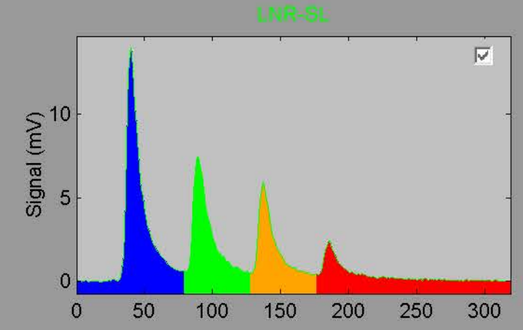
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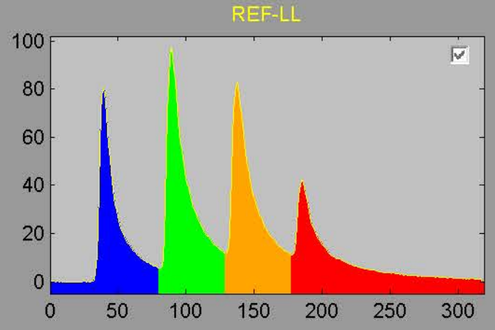


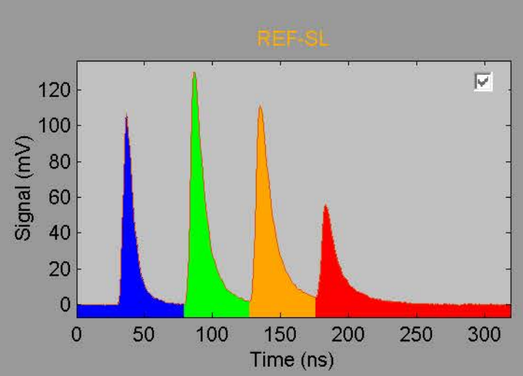


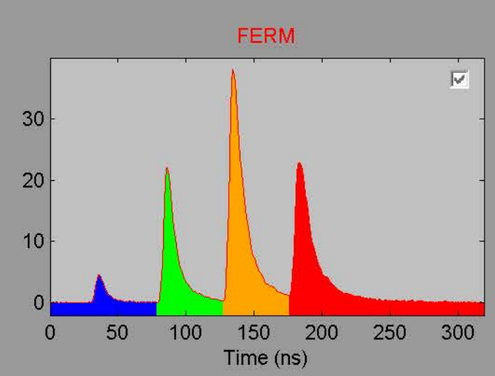




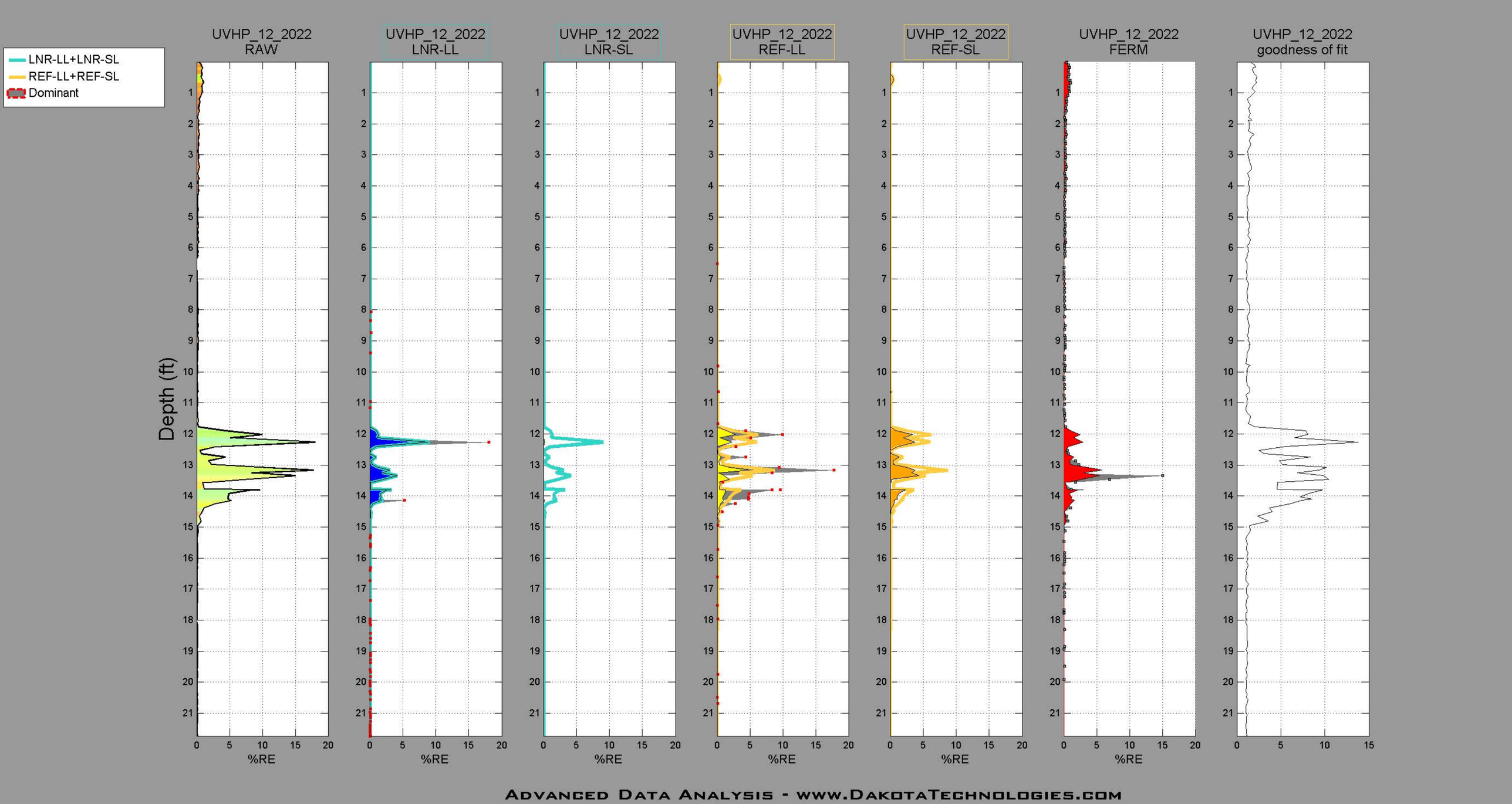


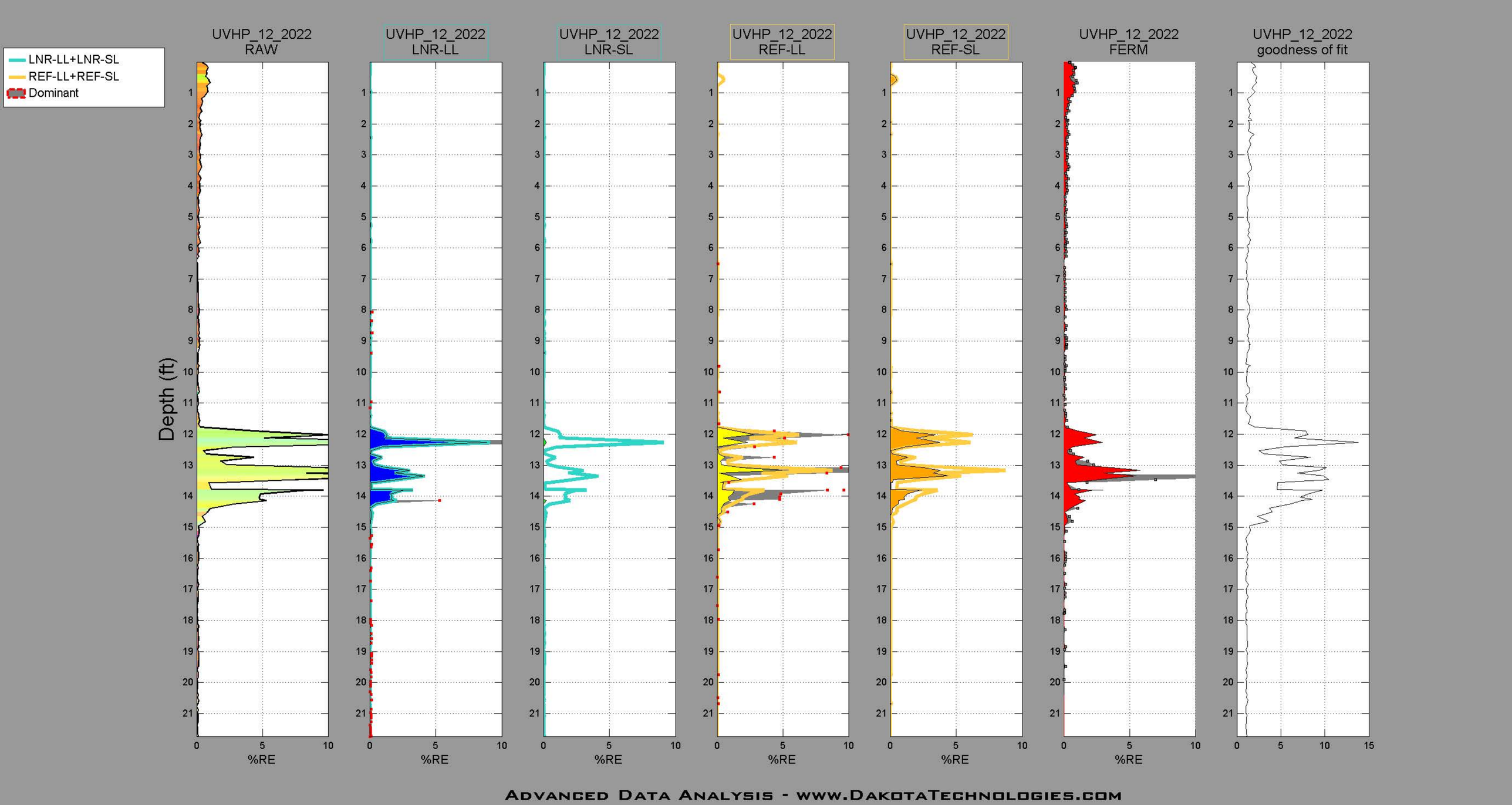


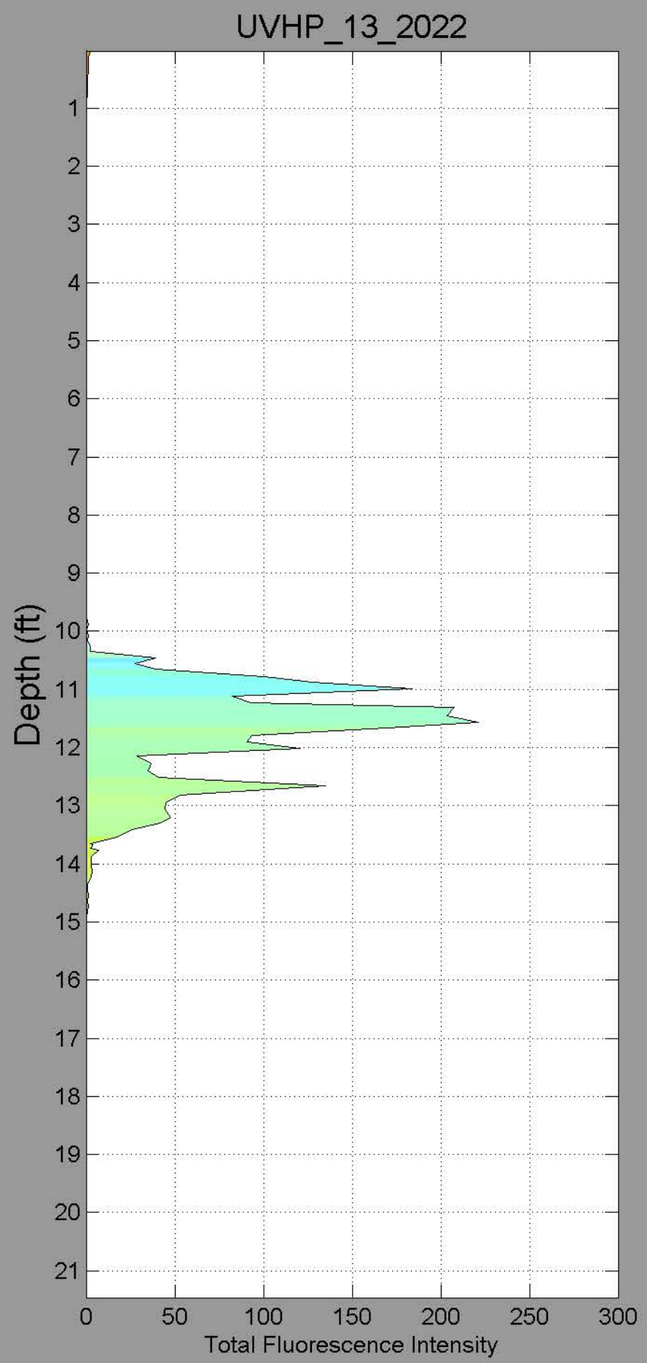




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LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_12_2022
RAW
UVHP_12_2022
LNR-LL
UVHP_12_2022
LNR-SL
UVHP_12_2022
REF-LL
UVHP_12_2022
REF-SL
UVHP_12_2022
FERM
UVHP_12_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
%RE
%RE
%RE
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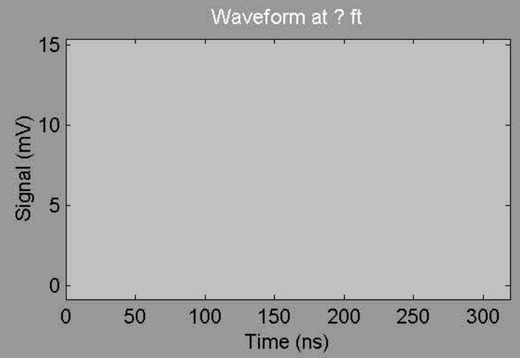

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LNR-SL
UVHP_12_2022
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UVHP_12_2022
REF-SL
UVHP_12_2022
FERM
UVHP_12_2022
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Depth (ft)
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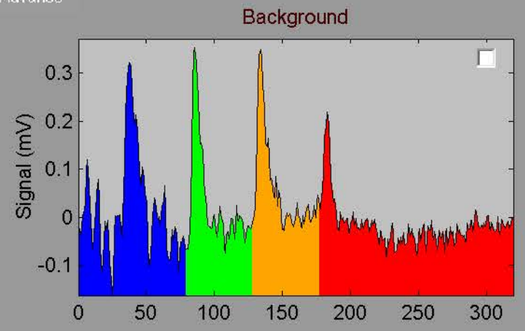
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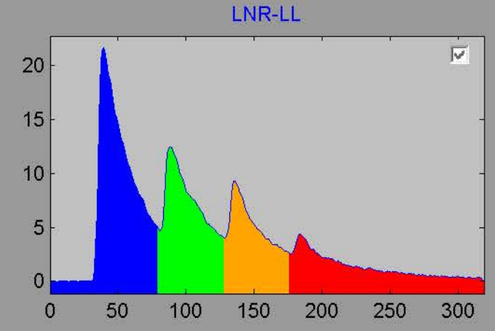
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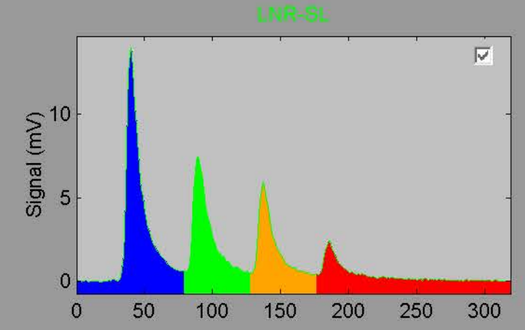
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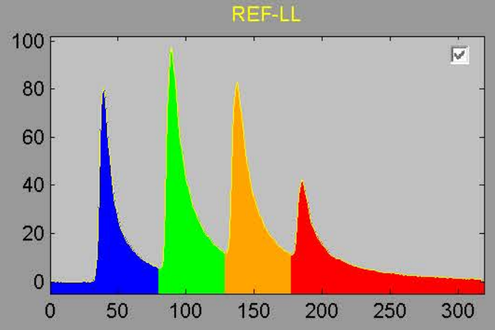


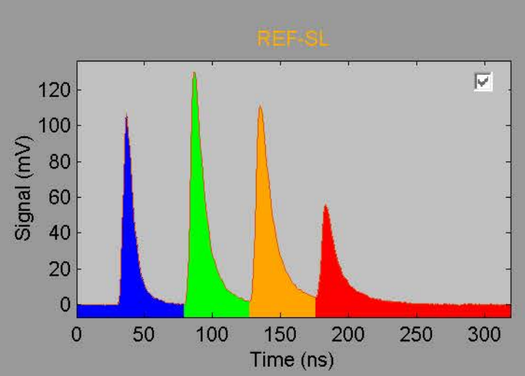


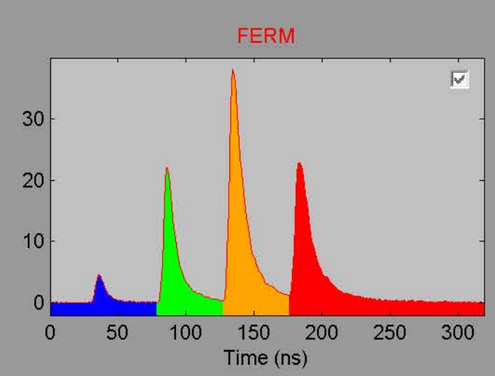




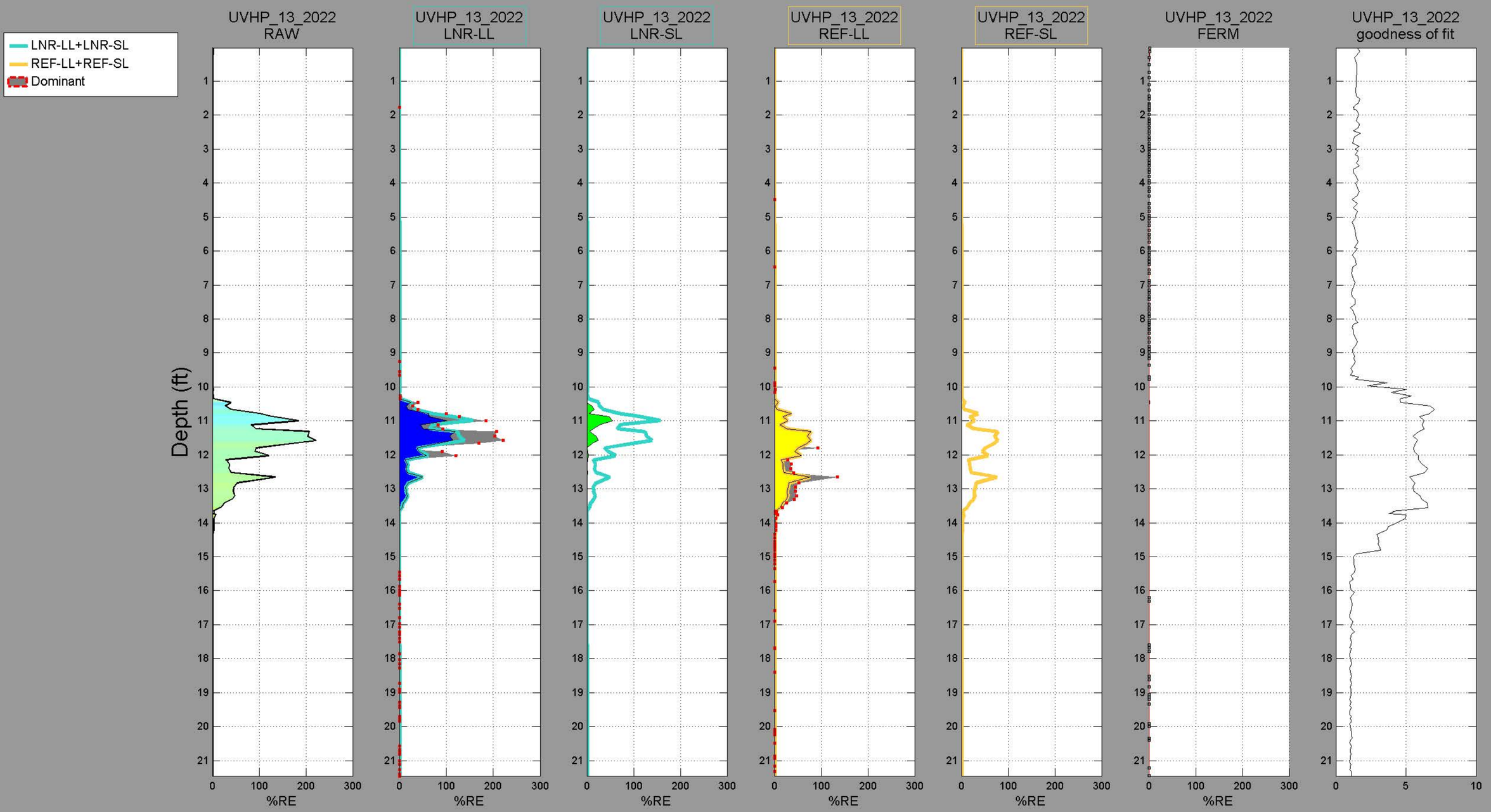


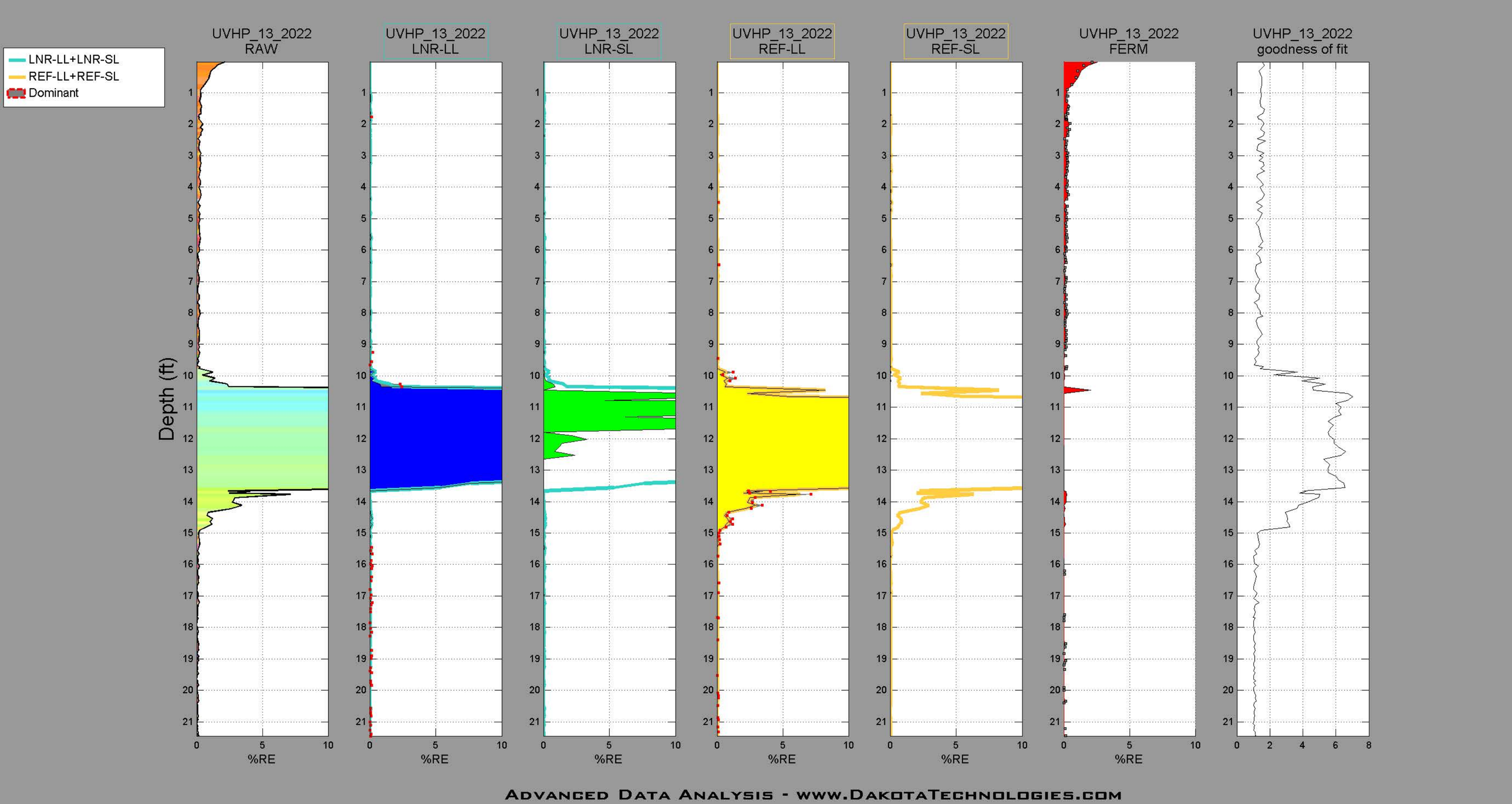


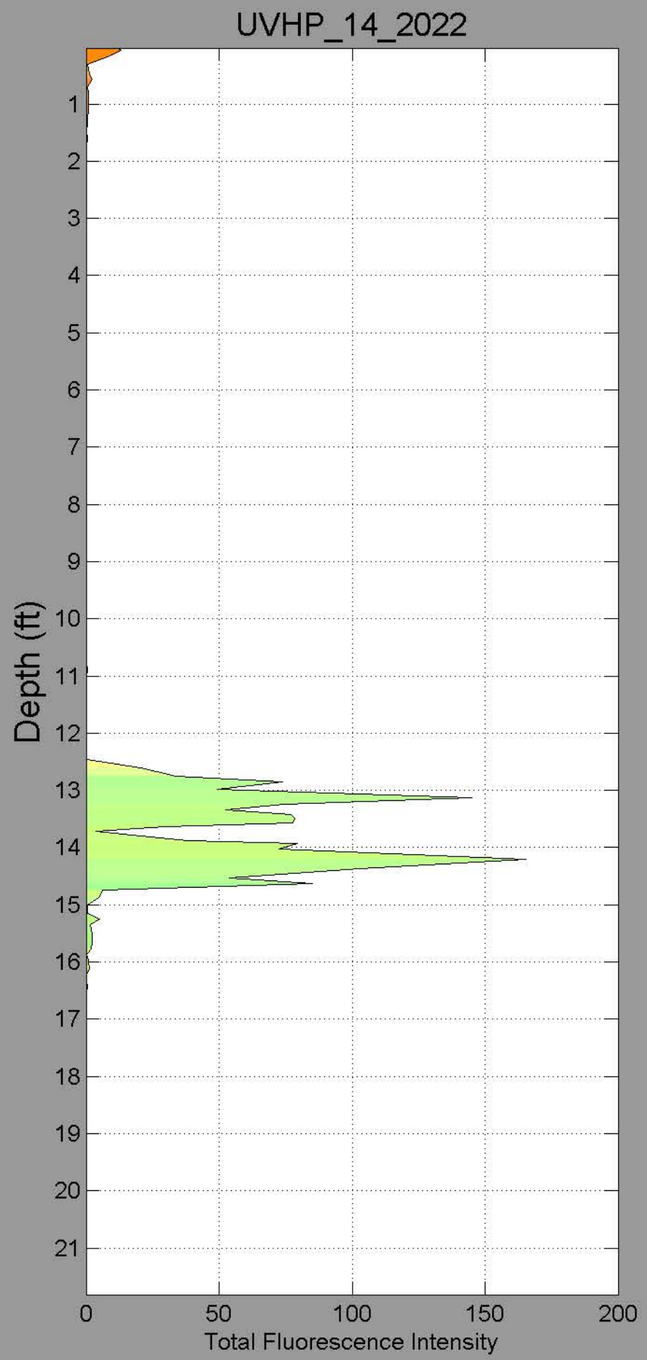




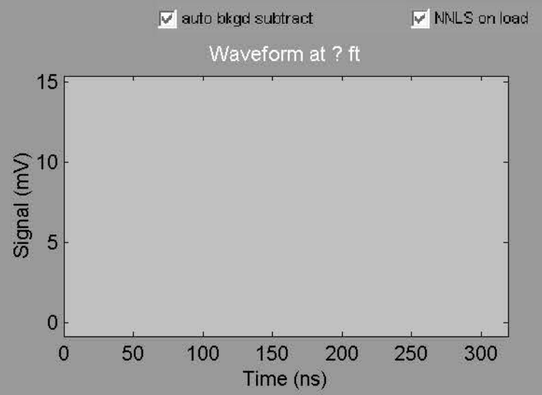
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LNR-LL
UVHP_13_2022
LNR-SL
UVHP_13_2022
REF-LL
UVHP_13_2022
REF-SL
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FERM
UVHP_13_2022
goodness of fit
Depth (ft)
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%RE

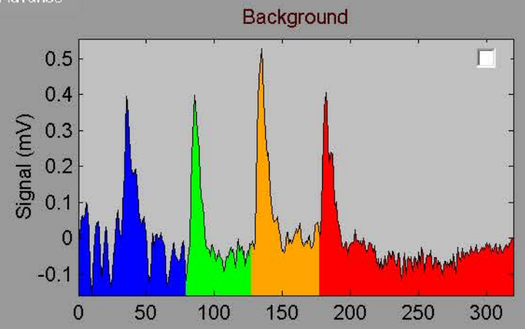

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UVHP_13_2022
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UVHP_13_2022
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UVHP_13_2022
FERM
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goodness of fit
Depth (ft)
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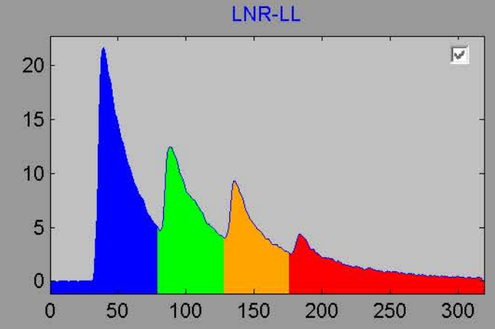


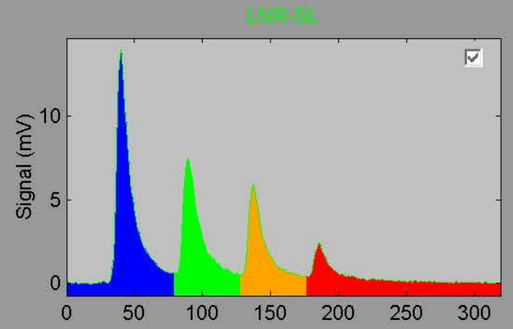
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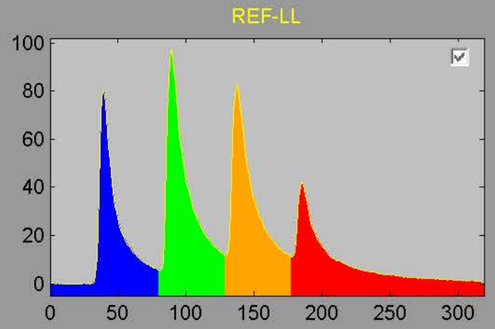


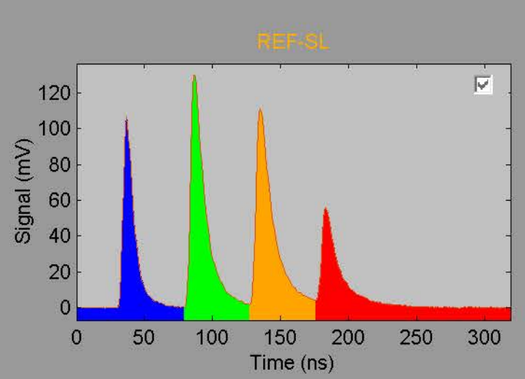


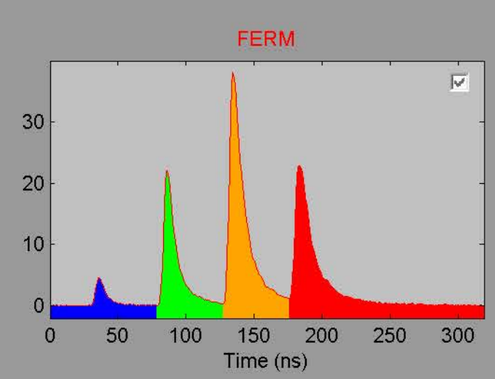




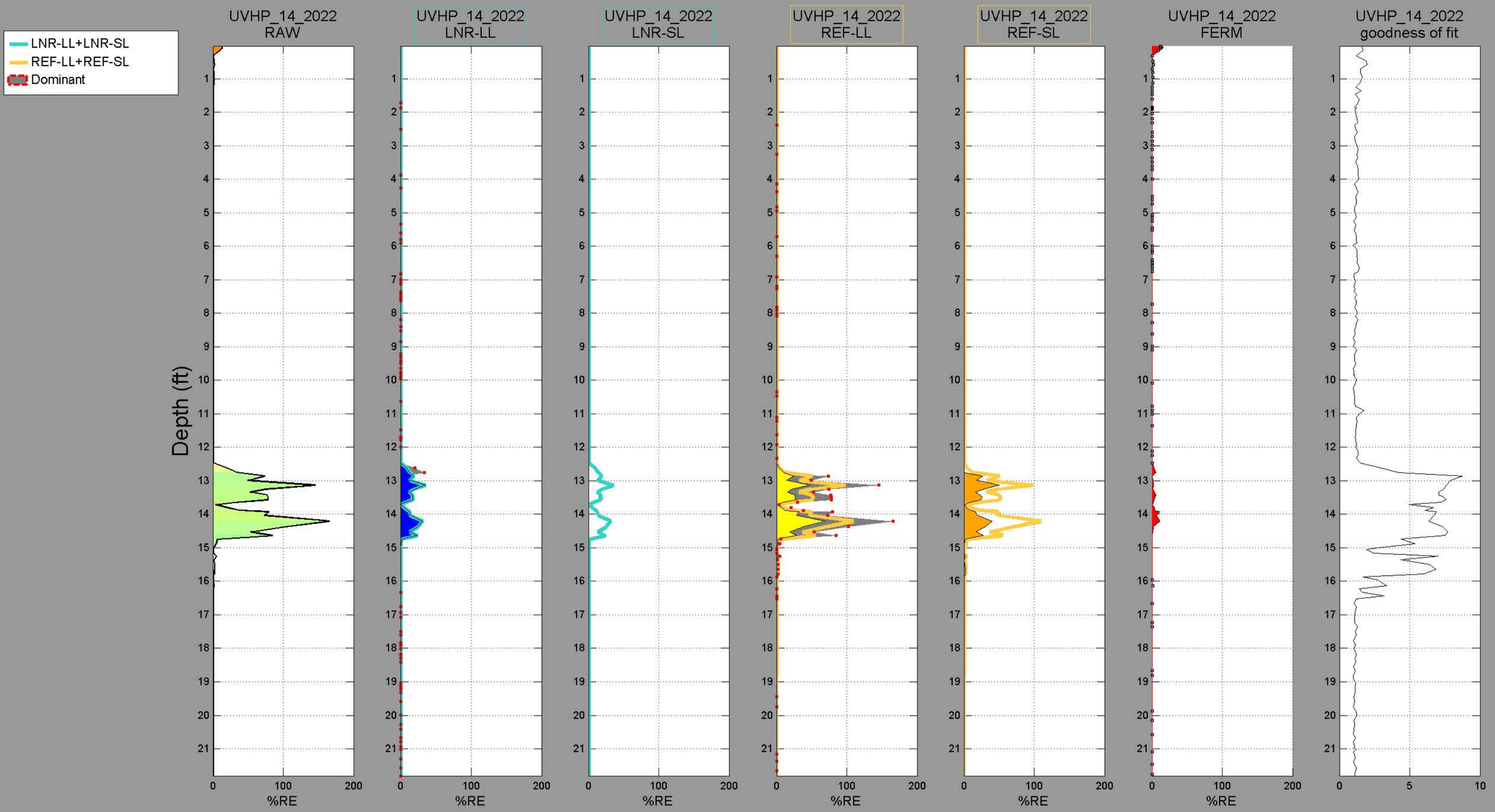


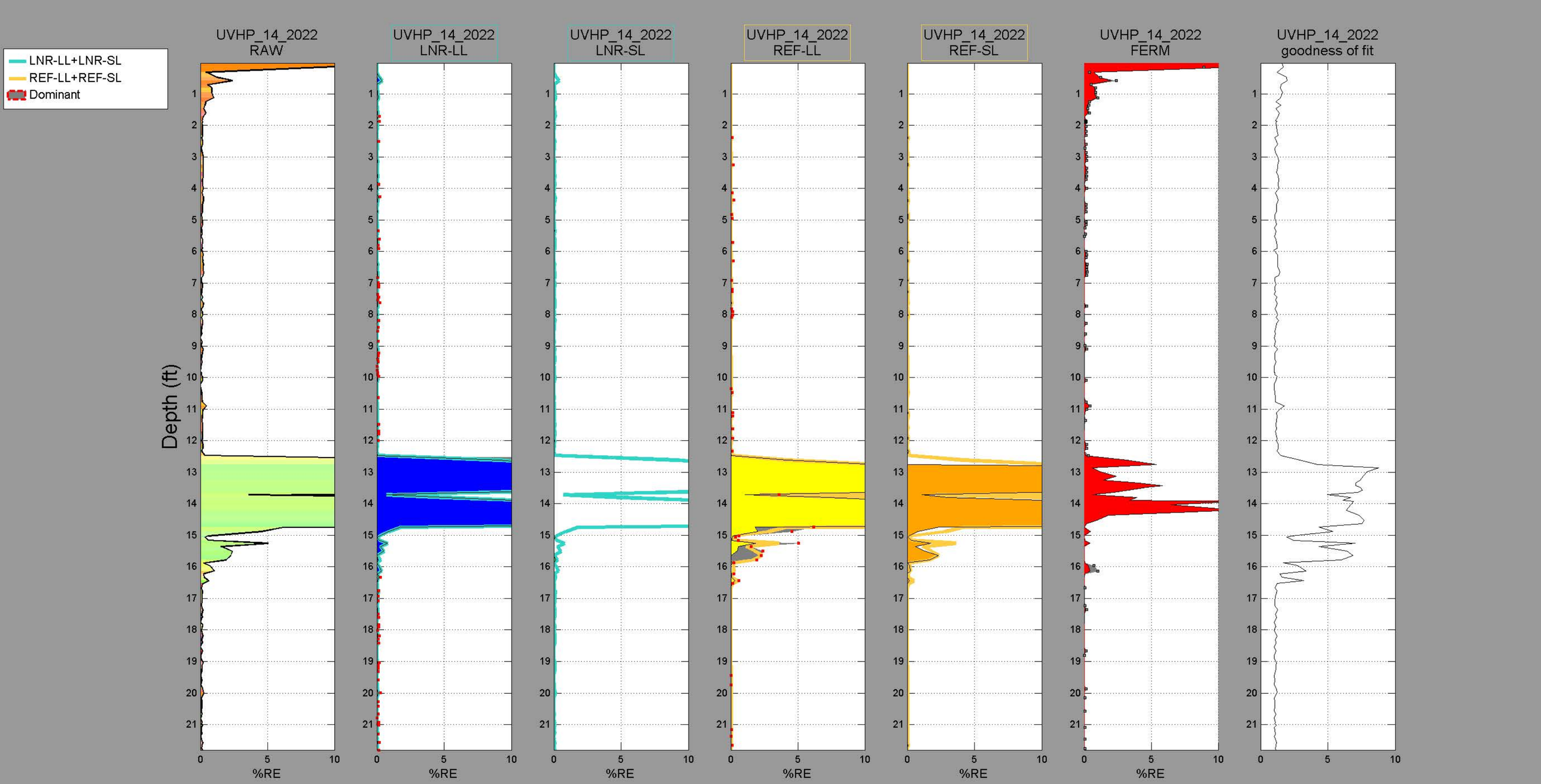


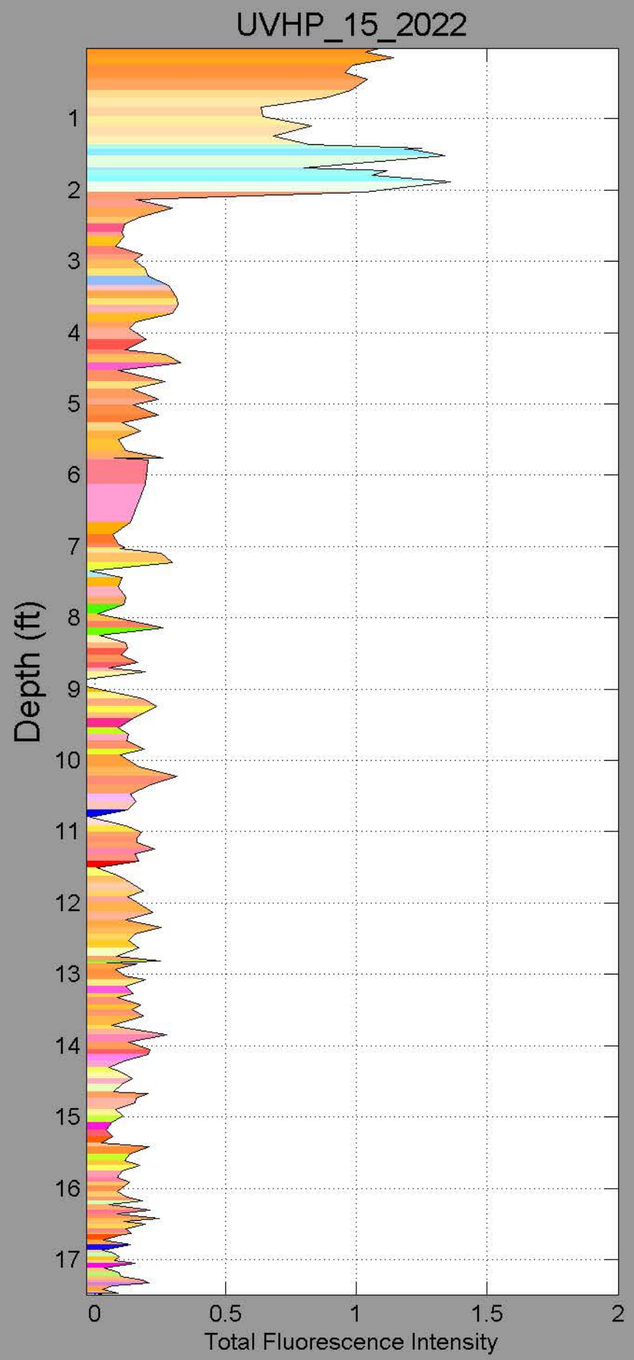




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LNR-LL+LNR-SL
REF-LL+REF-SL
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LNR-LL
UVHP_14_2022
LNR-SL
UVHP_14_2022
REF-LL
UVHP_14_2022
REF-SL
UVHP_14_2022
FERM
UVHP_14_2022
goodness of fit
Depth (ft)
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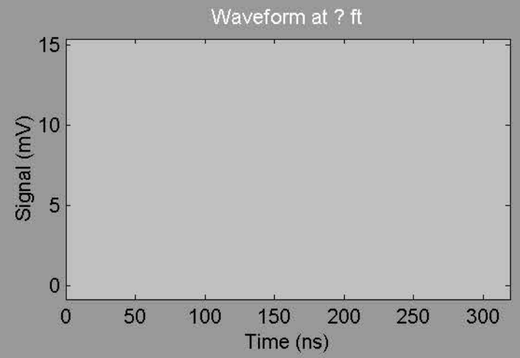

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UVHP_14_2022
REF-LL
UVHP_14_2022
REF-SL
UVHP_14_2022
FERM
UVHP_14_2022
goodness of fit
Depth (ft)
%RE
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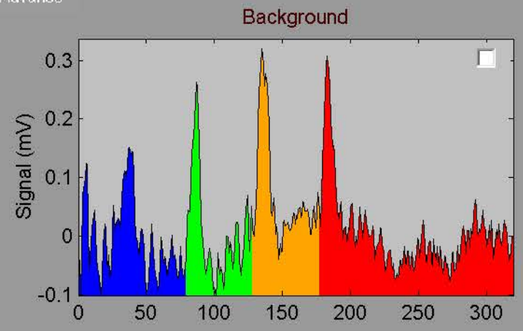
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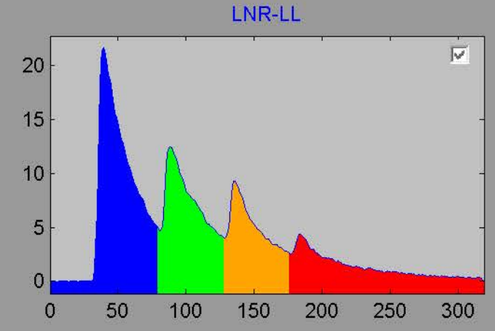
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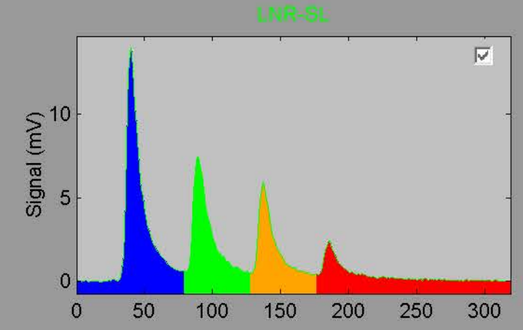
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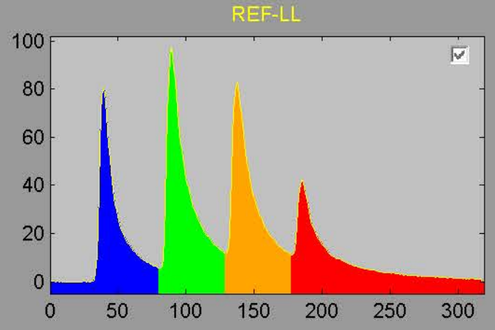


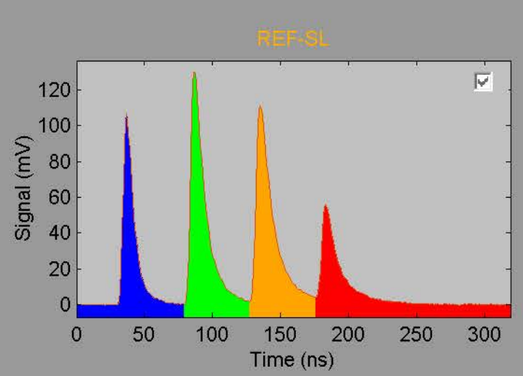


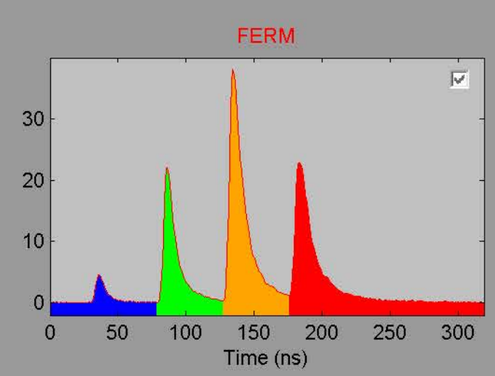




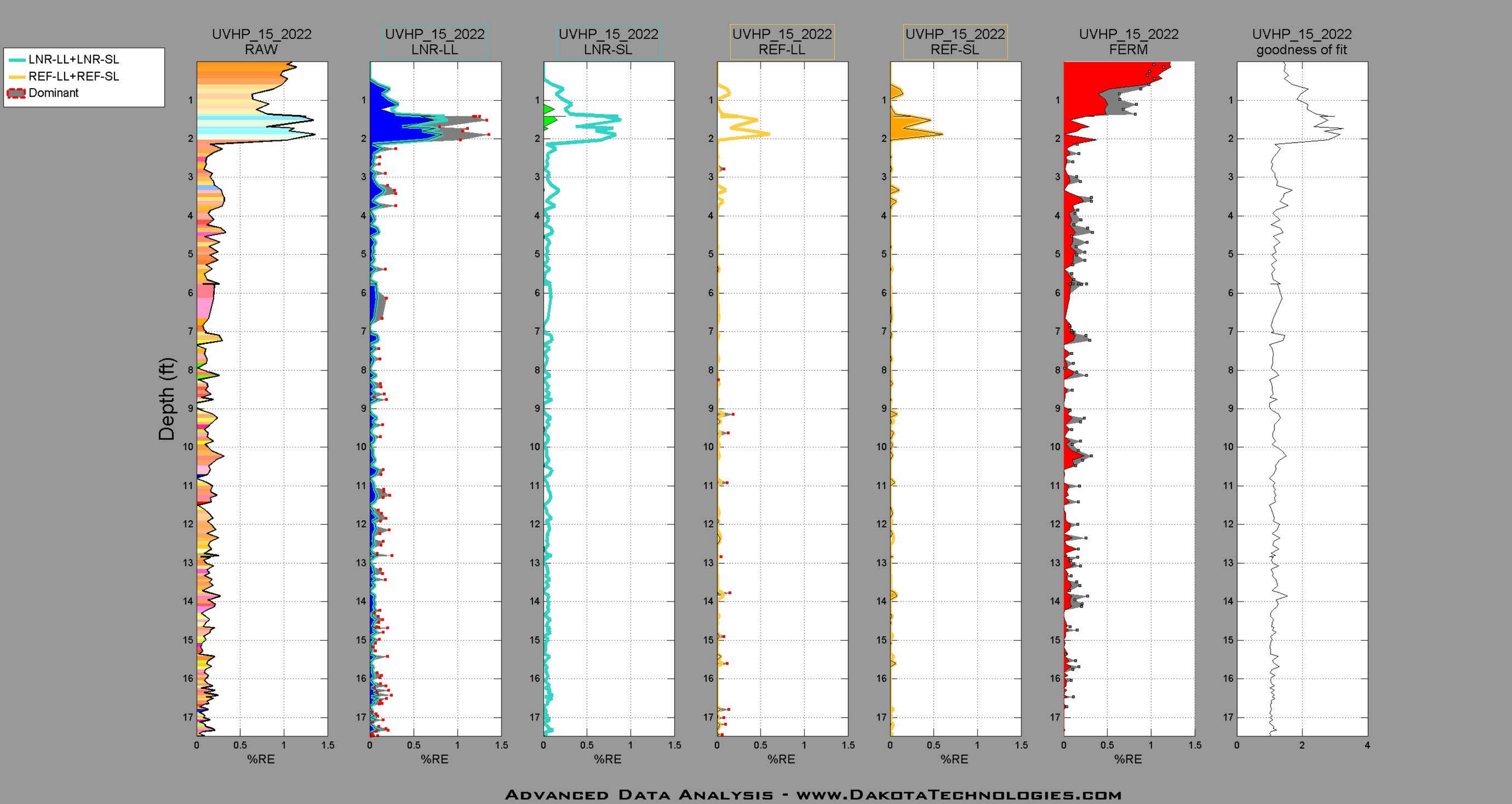


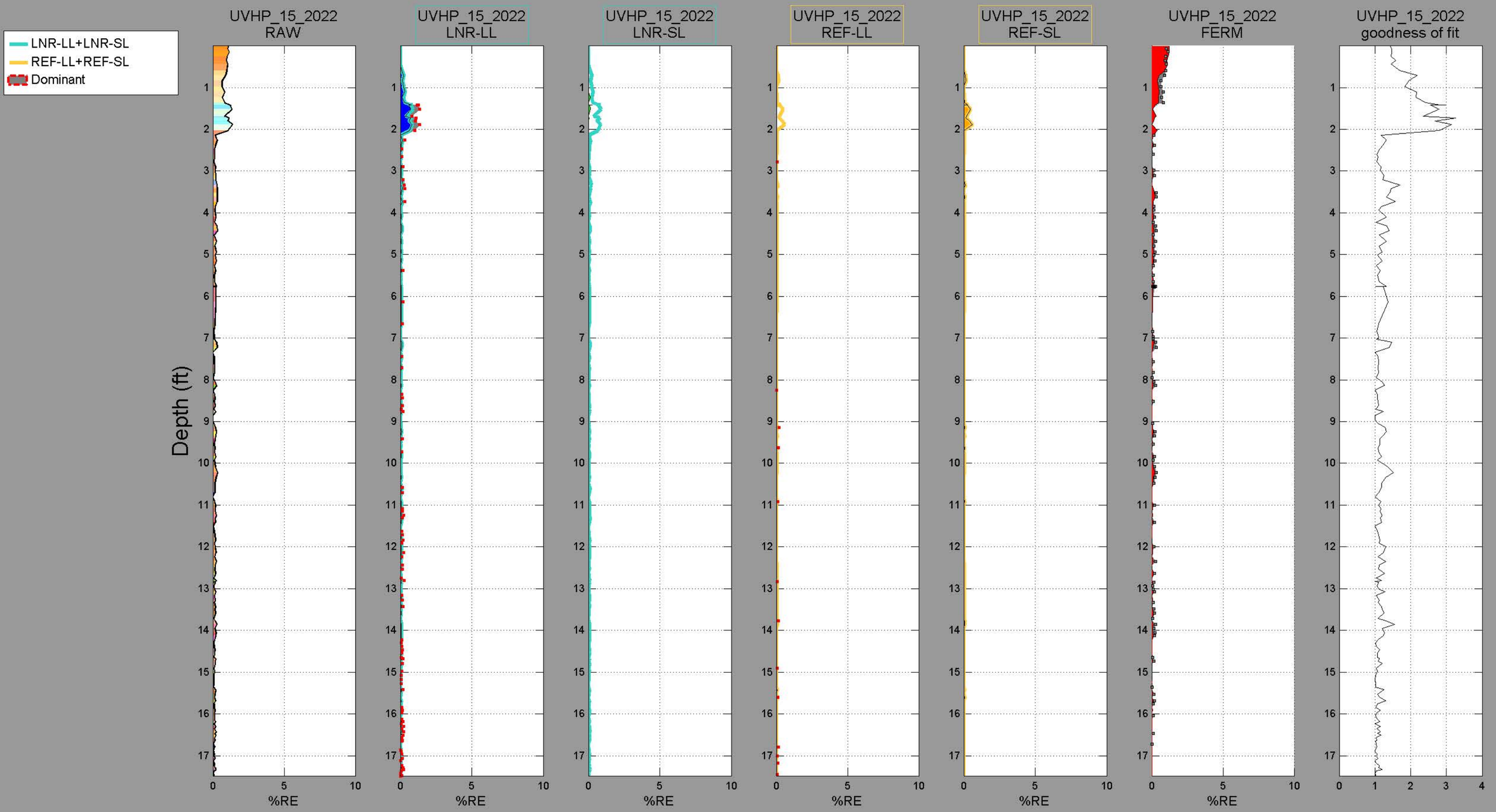


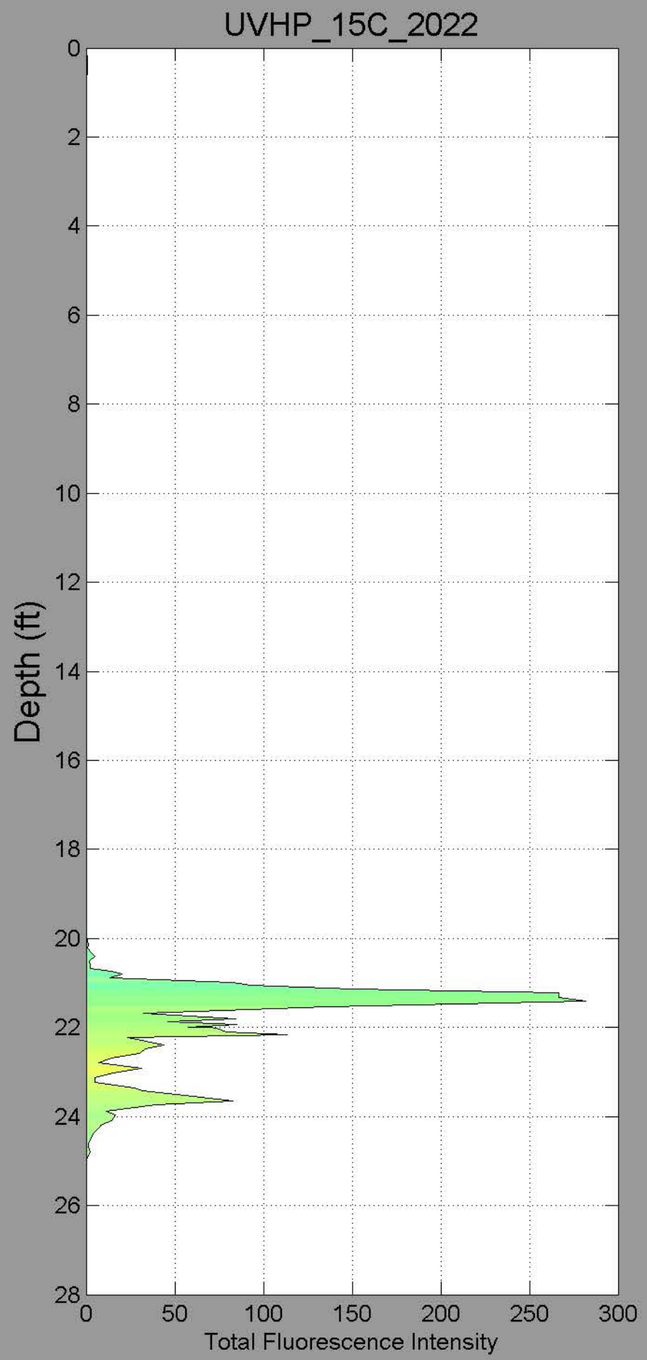




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LNR-LL+LNR-SL
REF-LL+REF-SL
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RAW
UVHP_15_2022
LNR-LL
UVHP_15_2022
LNR-SL
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REF-LL
UVHP_15_2022
REF-SL
UVHP_15_2022
FERM
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goodness of fit
Depth (ft)
%RE
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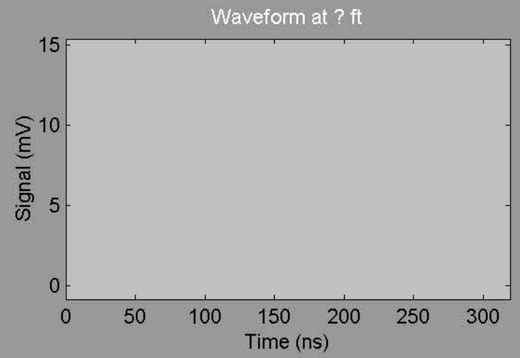

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goodness of fit
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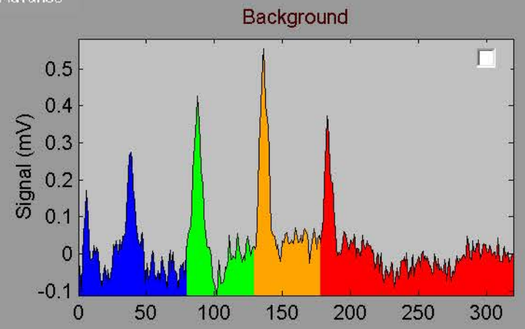
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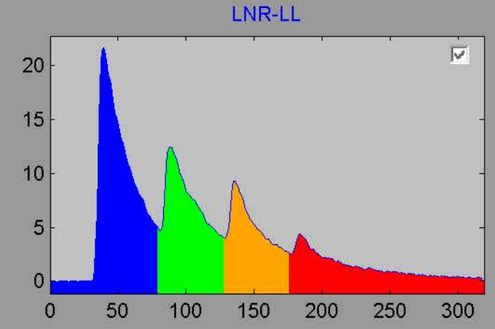
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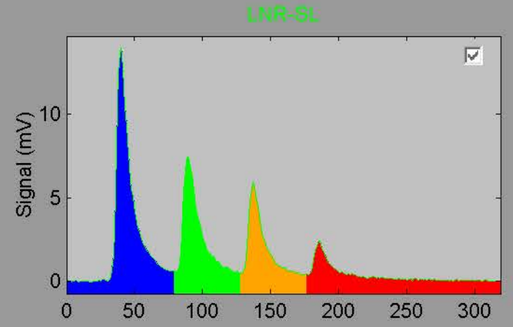
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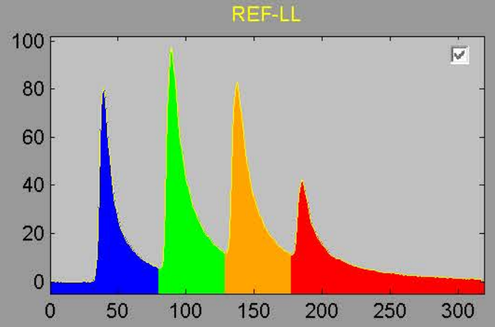


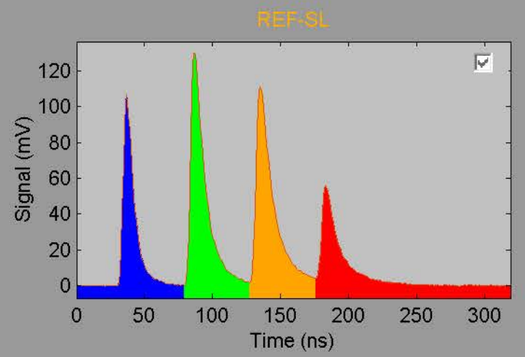


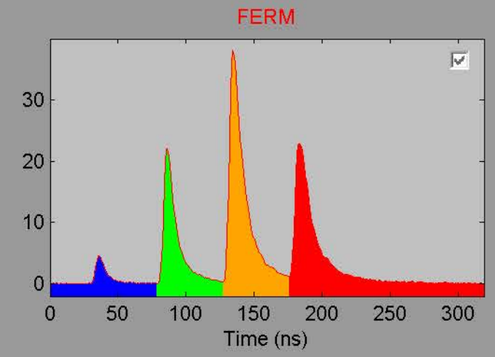




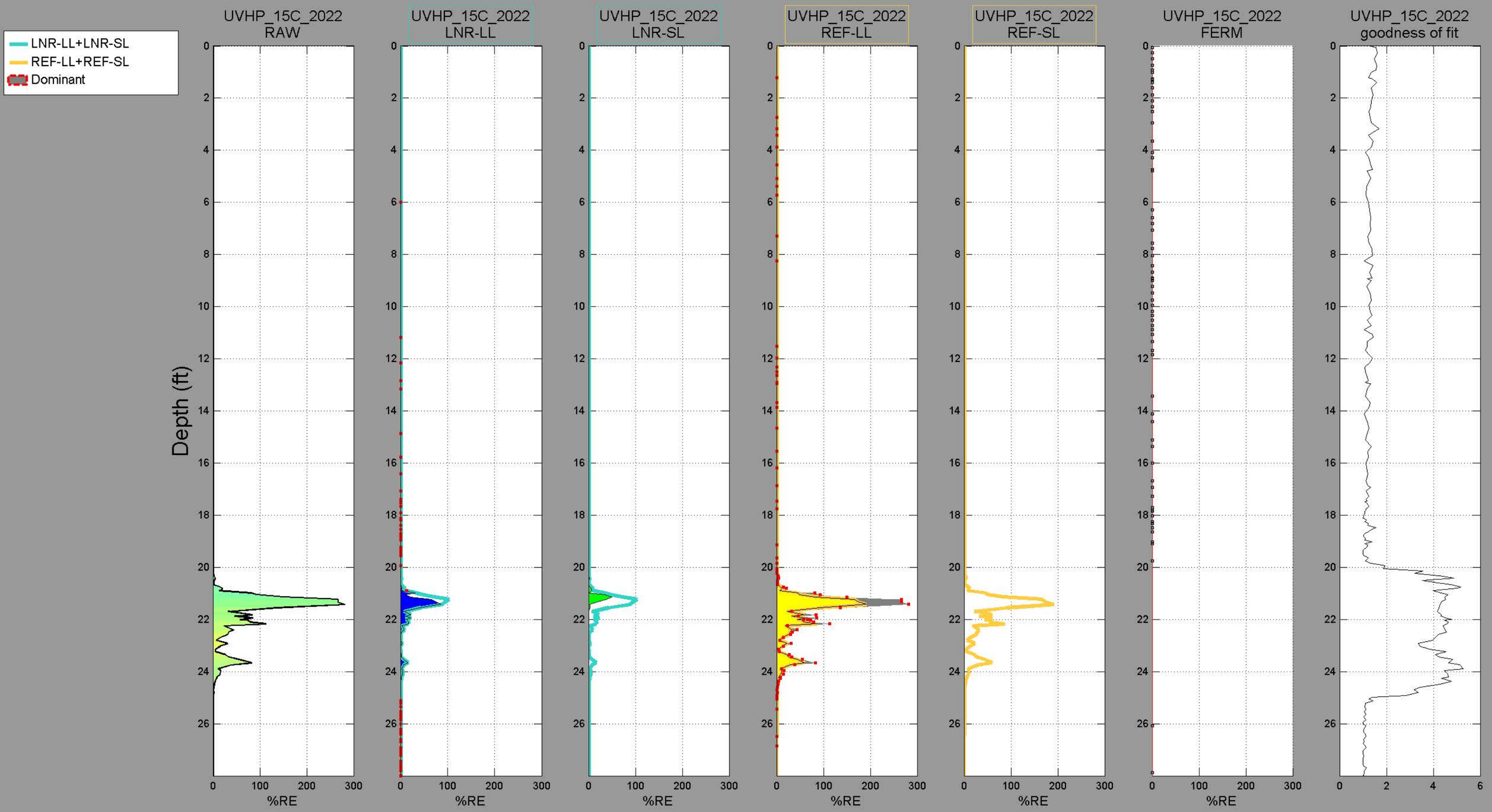


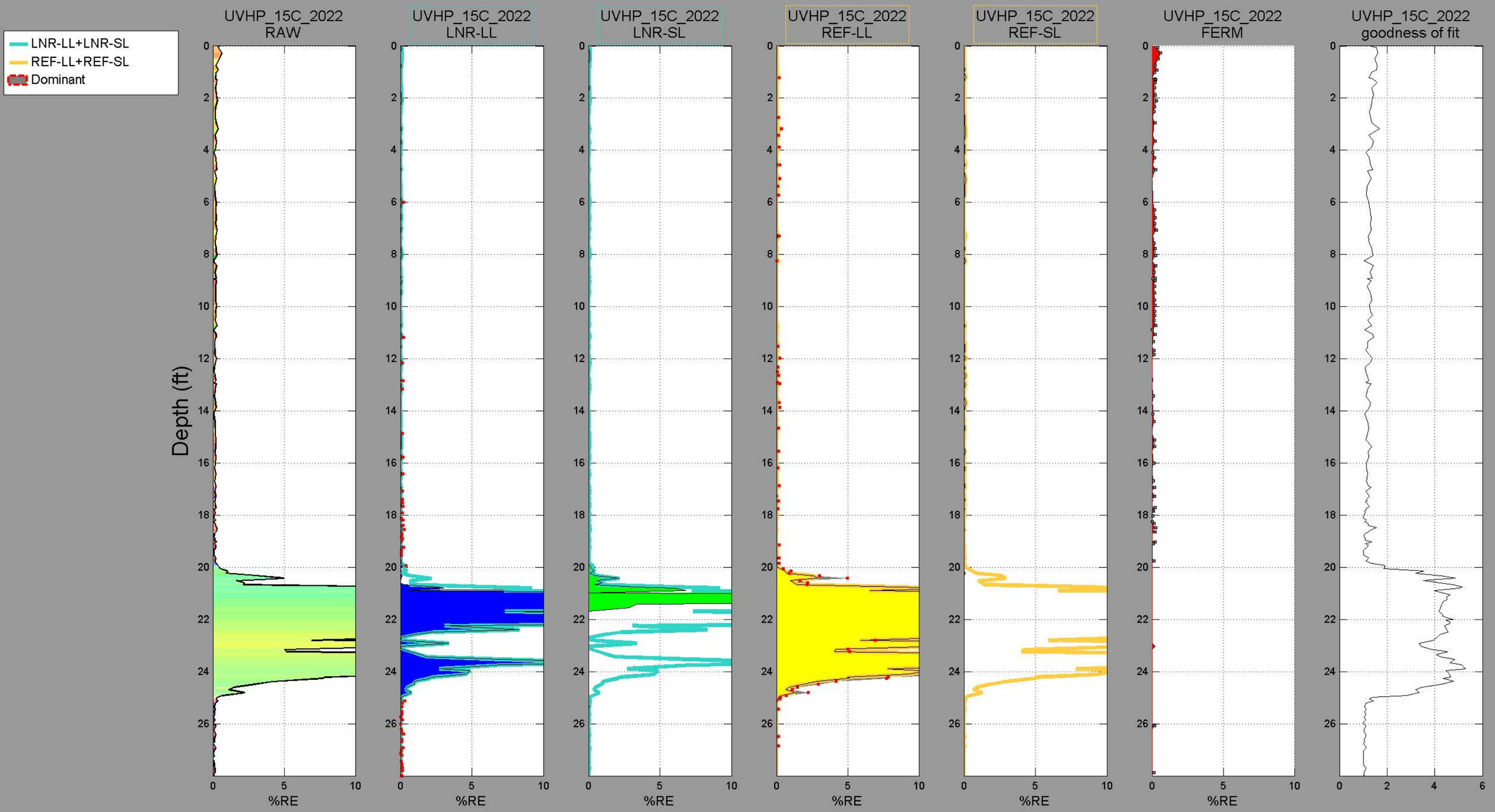




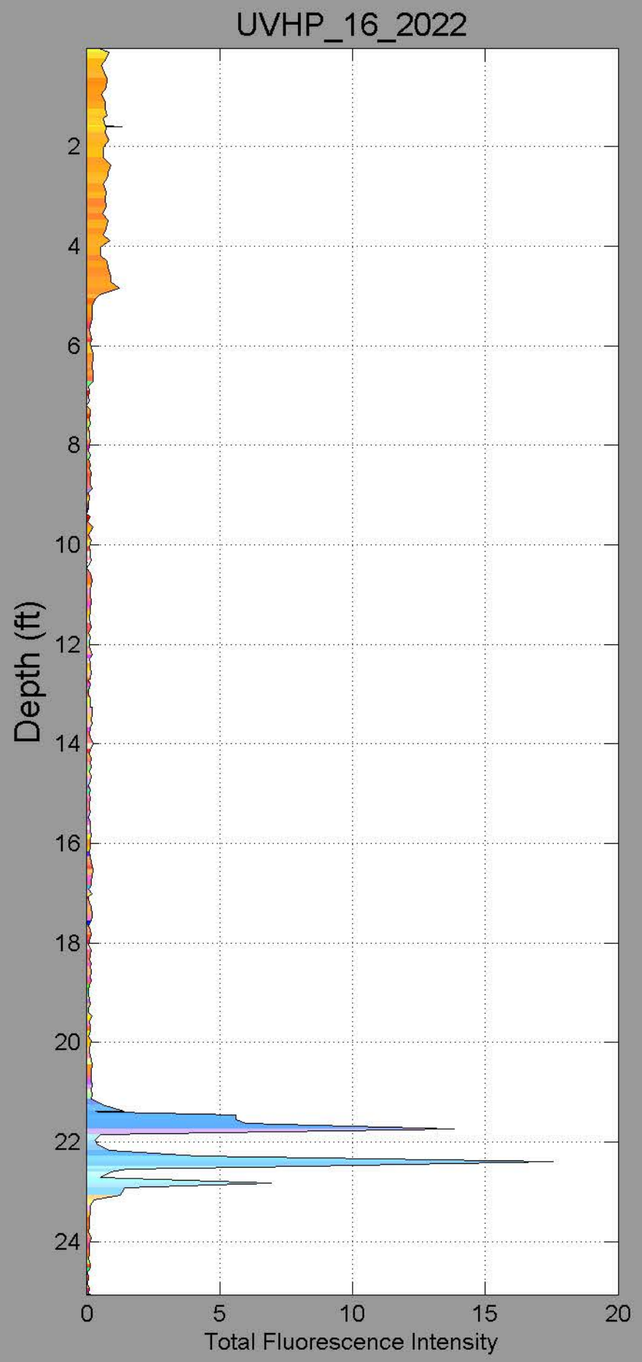


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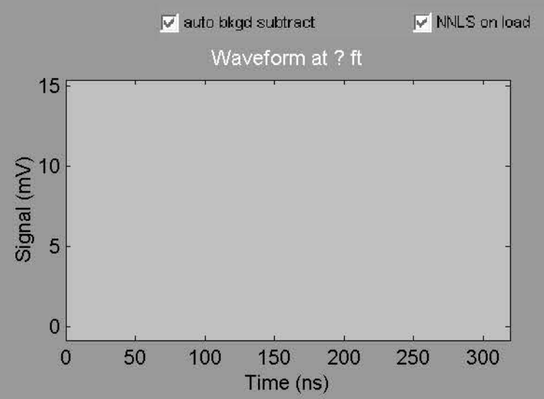

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UVHP_15C_2022
REF-SL
UVHP_15C_2022
FERM
UVHP_15C_2022
goodness of fit
Depth (ft)
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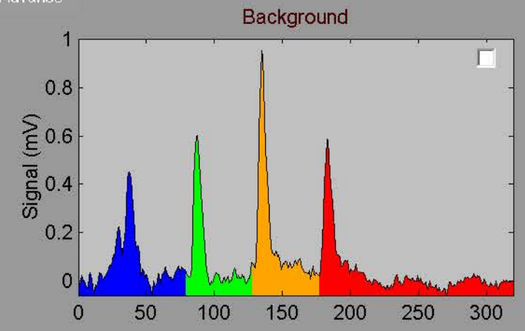
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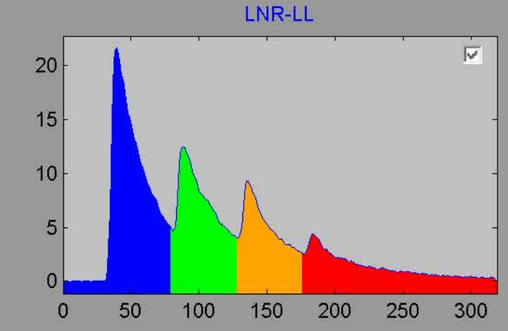


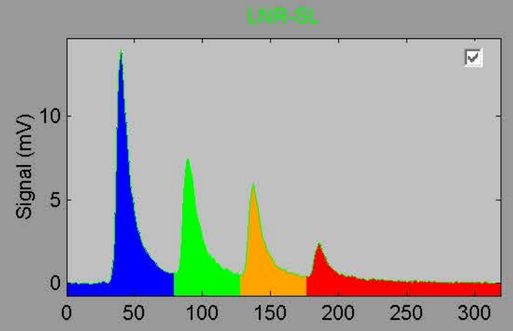
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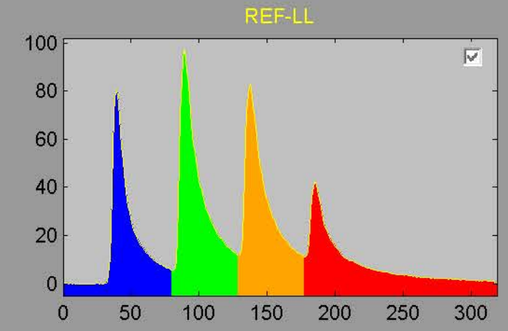


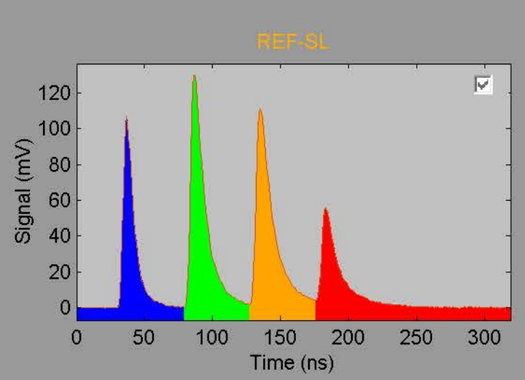


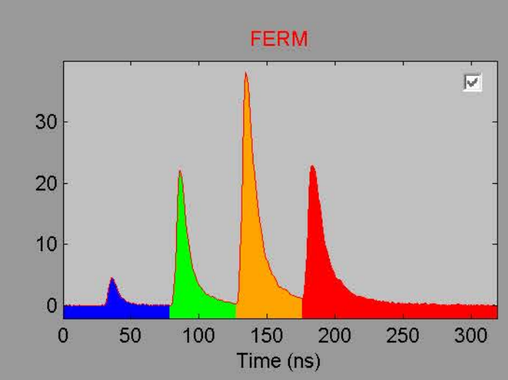




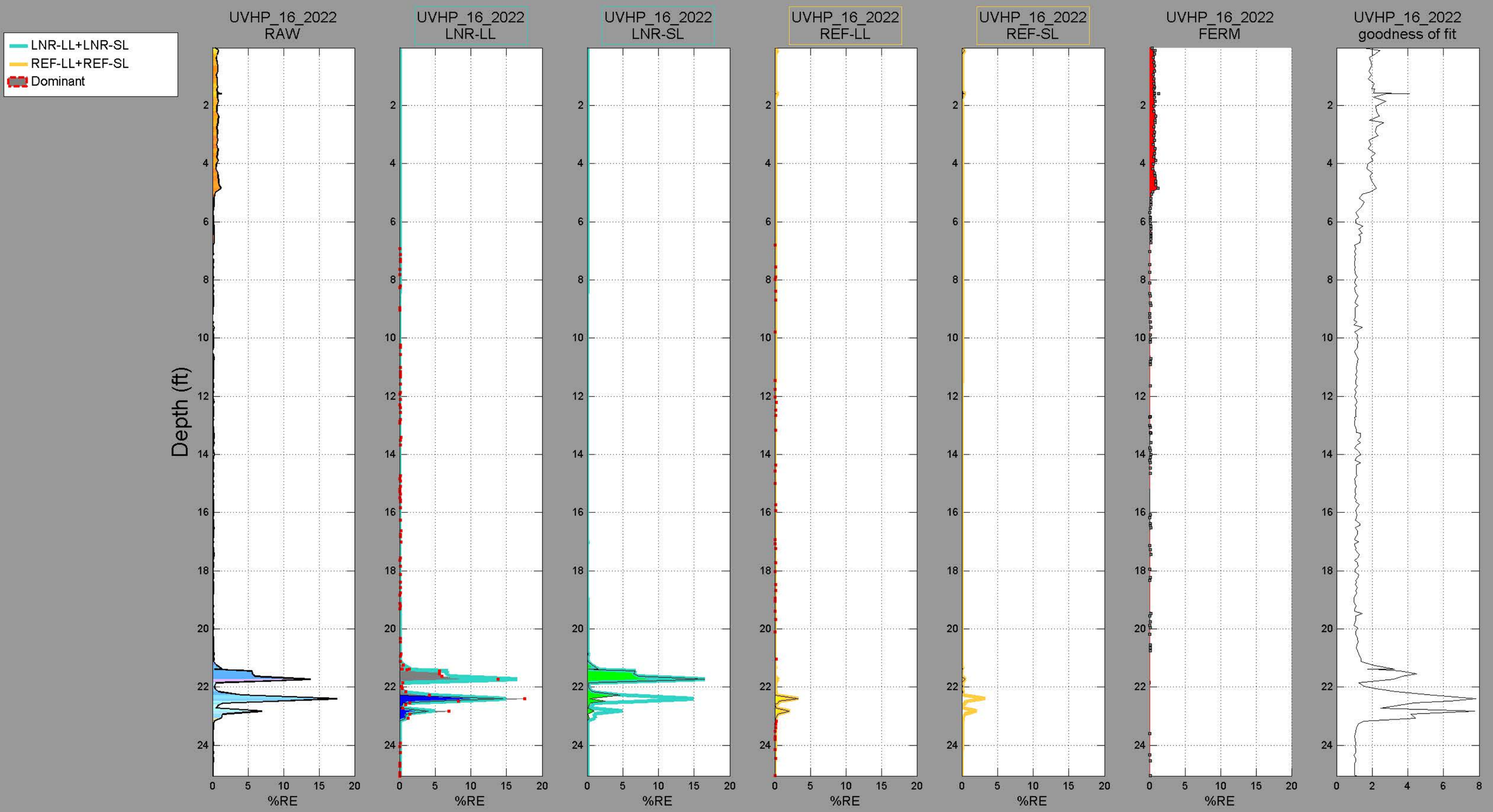


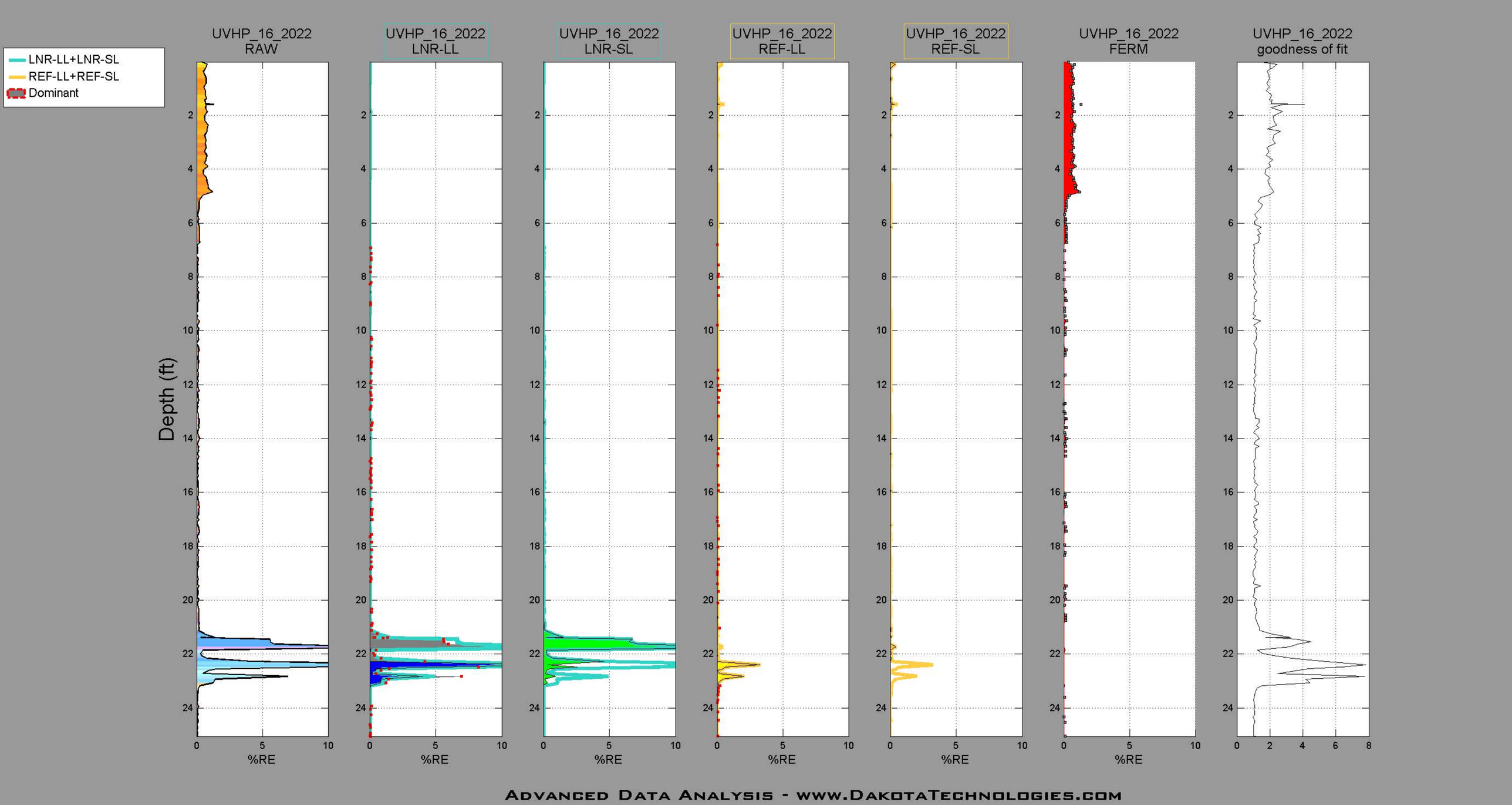


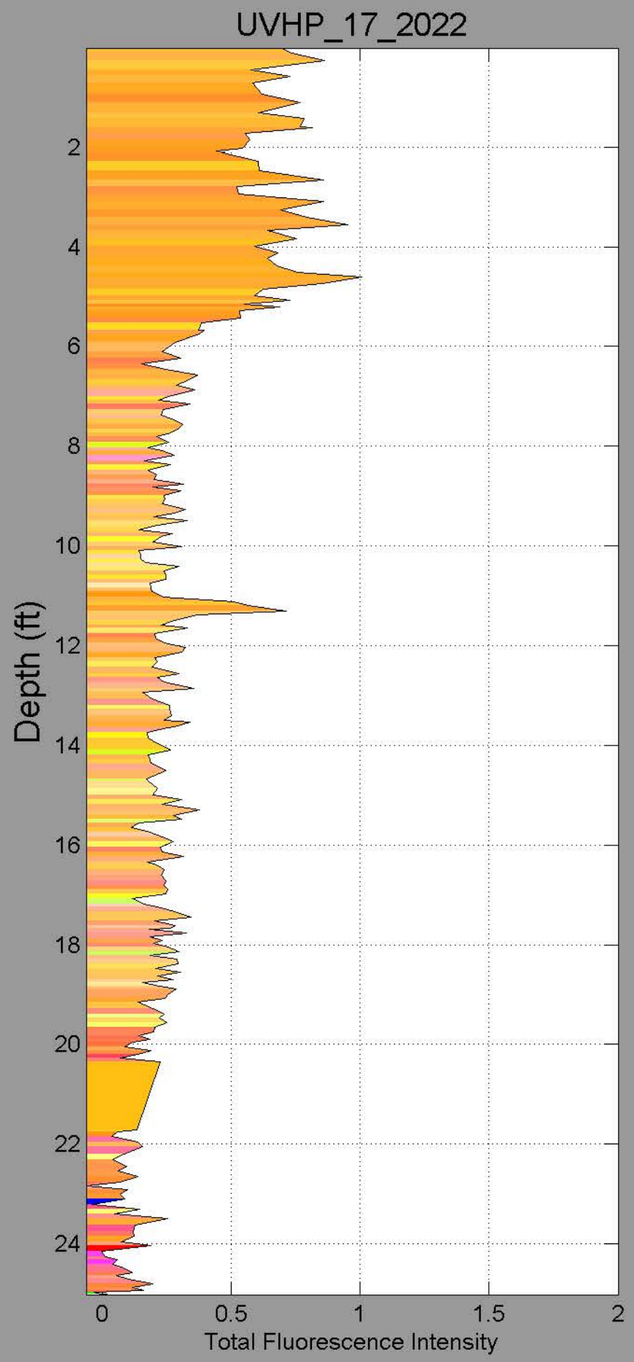




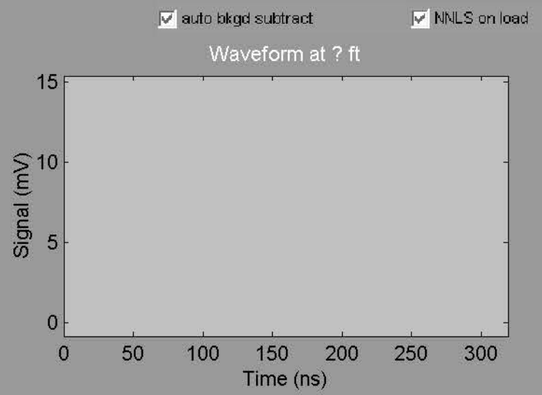
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LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_16_2022
RAW
UVHP_16_2022
LNR-LL
UVHP_16_2022
LNR-SL
UVHP_16_2022
REF-LL
UVHP_16_2022
REF-SL
UVHP_16_2022
FERM
UVHP_16_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
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%RE
%RE

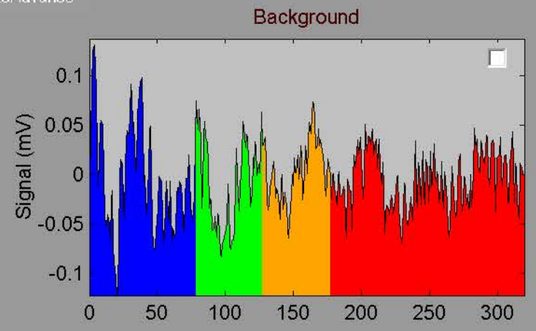

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REF-LL+REF-SL
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UVHP_16_2022
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FERM
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goodness of fit
Depth (ft)
%RE
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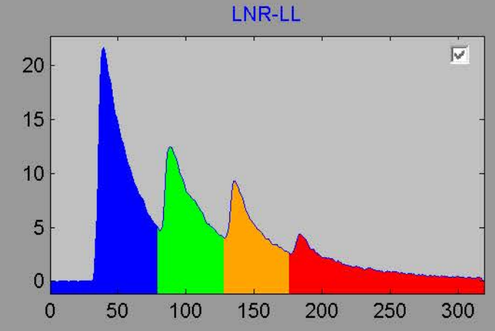


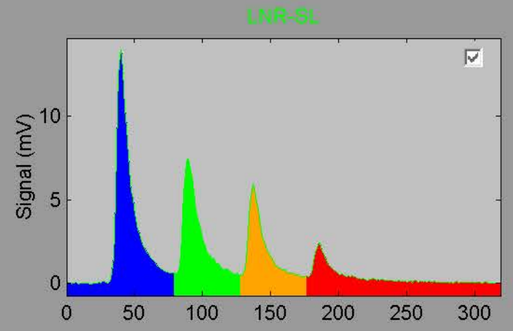
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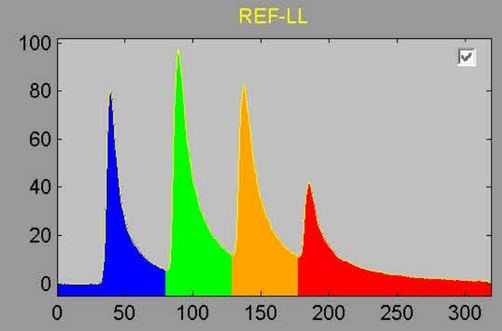


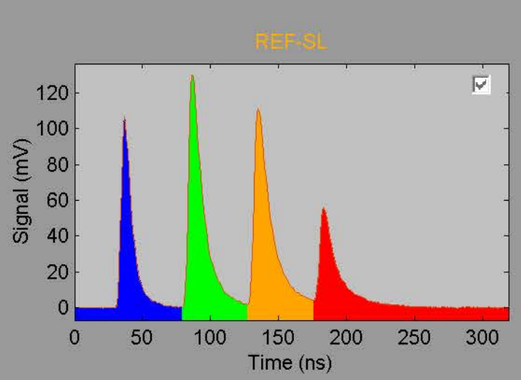


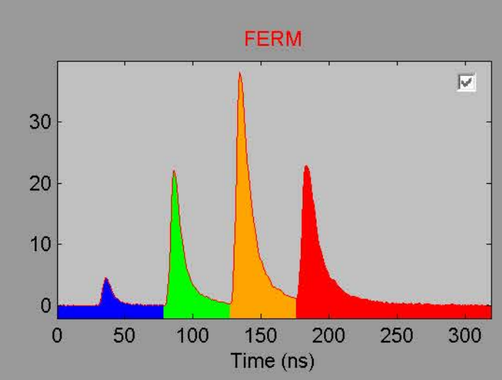




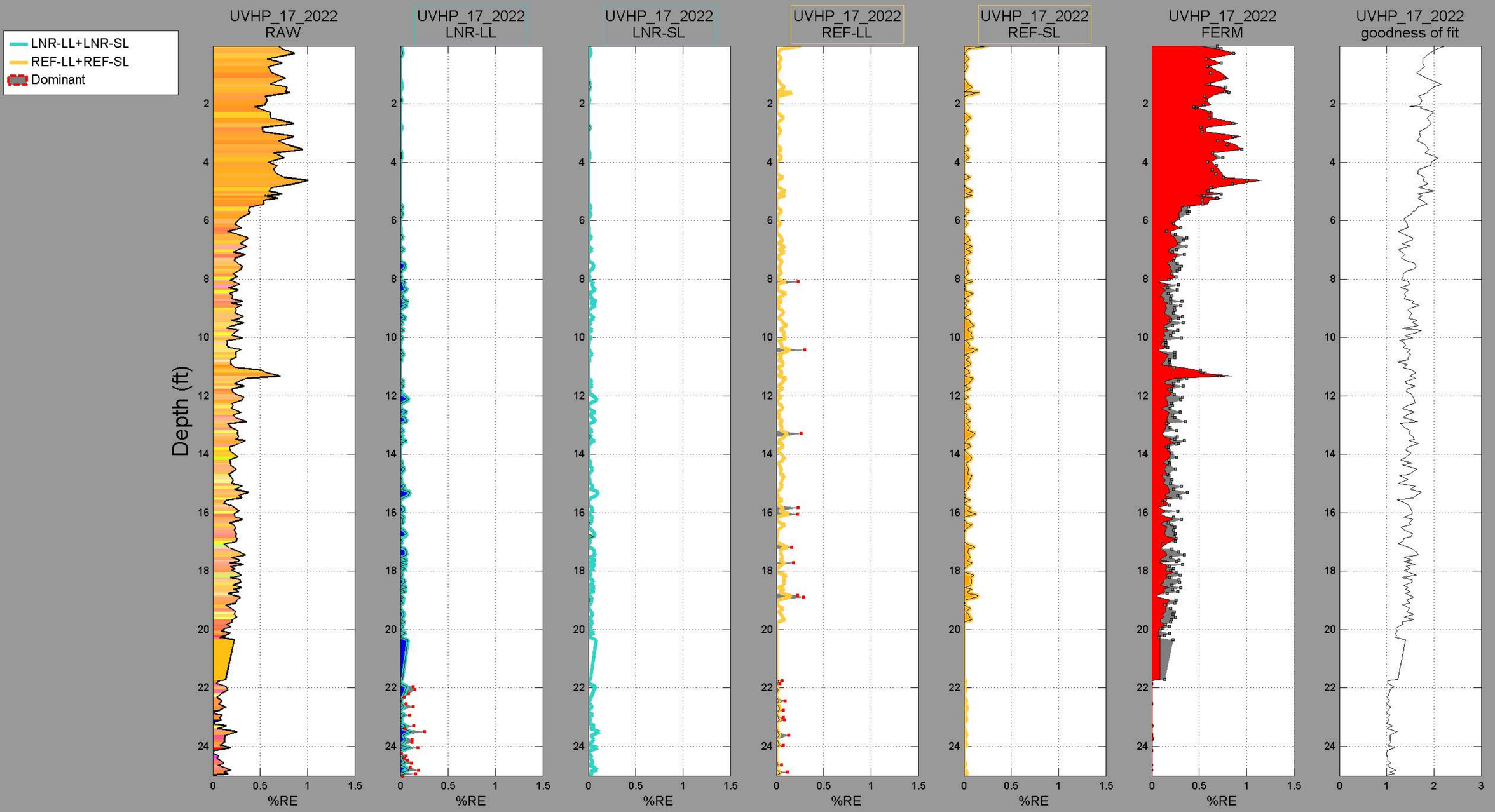


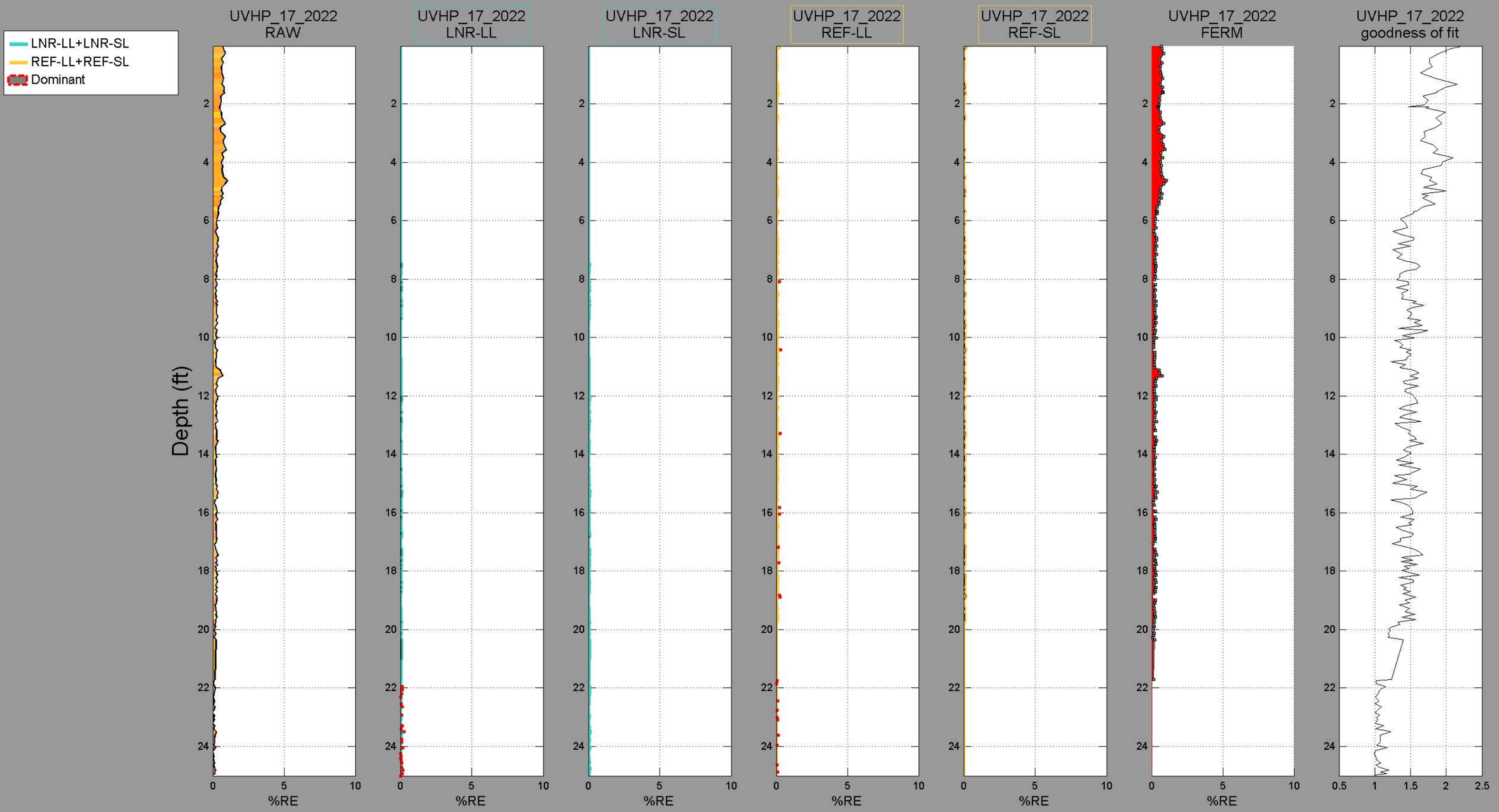


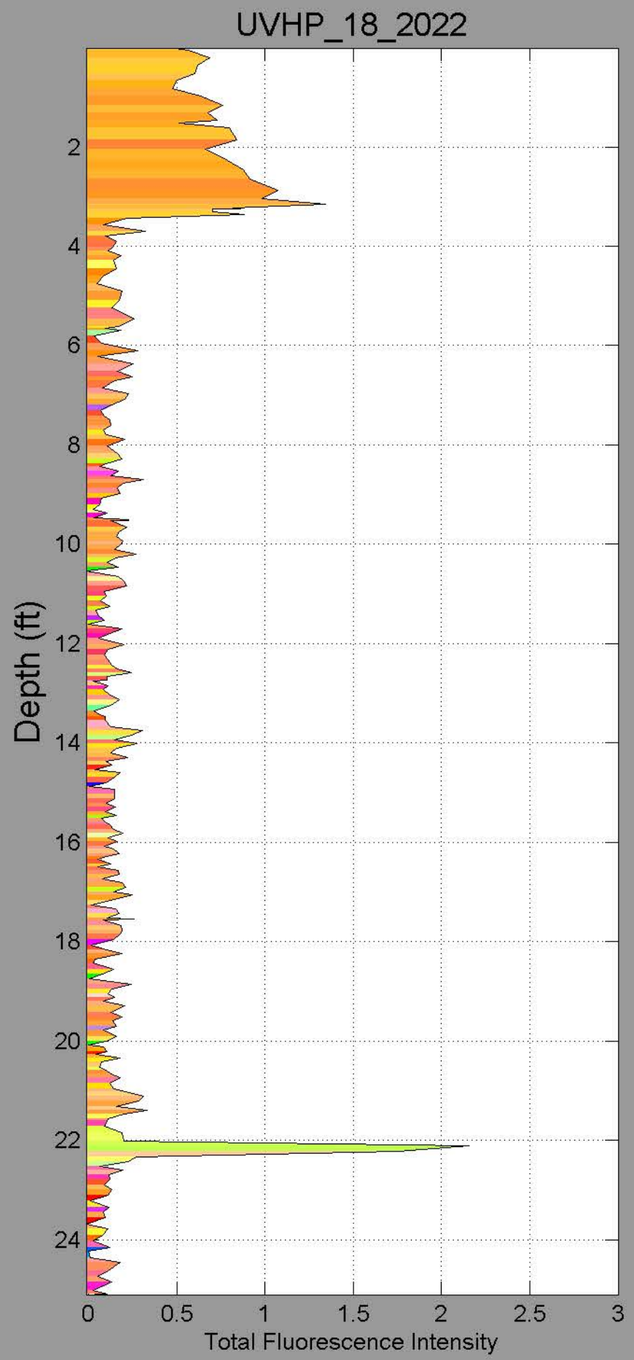




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LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_17_2022
RAW
UVHP_17_2022
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UVHP_17_2022
LNR-SL
UVHP_17_2022
REF-LL
UVHP_17_2022
REF-SL
UVHP_17_2022
FERM
UVHP_17_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
%RE
%RE
%RE

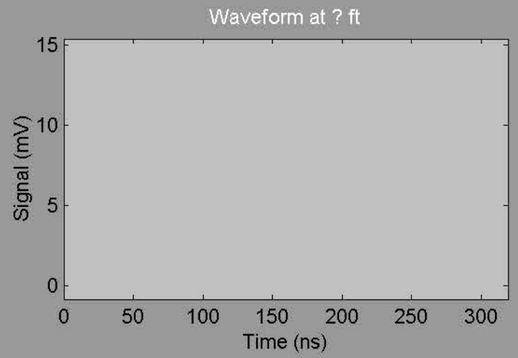

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REF-LL+REF-SL
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RAW
UVHP_17_2022
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UVHP_17_2022
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UVHP_17_2022
REF-SL
UVHP_17_2022
FERM
UVHP_17_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
%RE
%RE



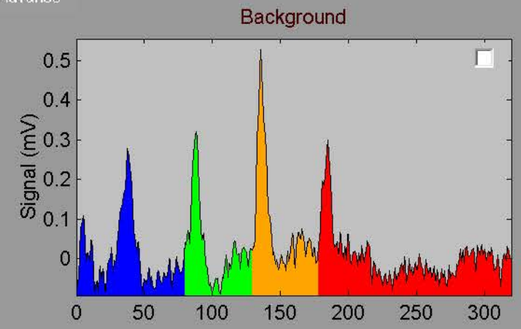
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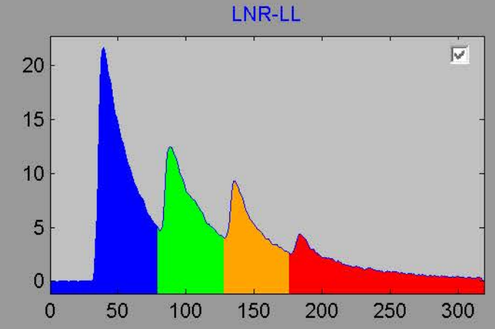
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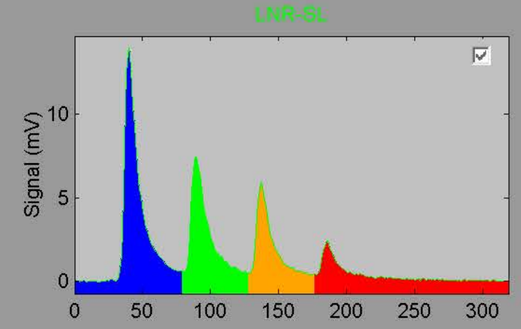
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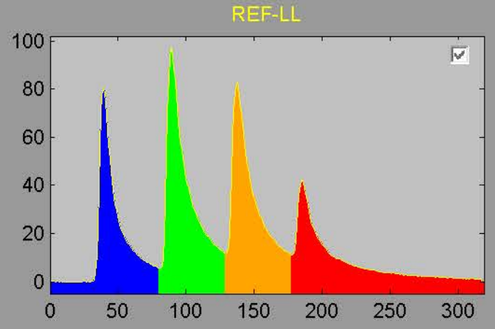


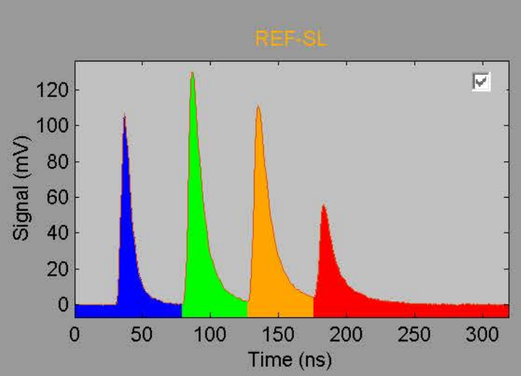


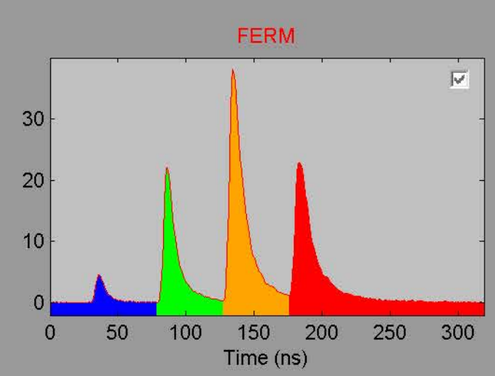




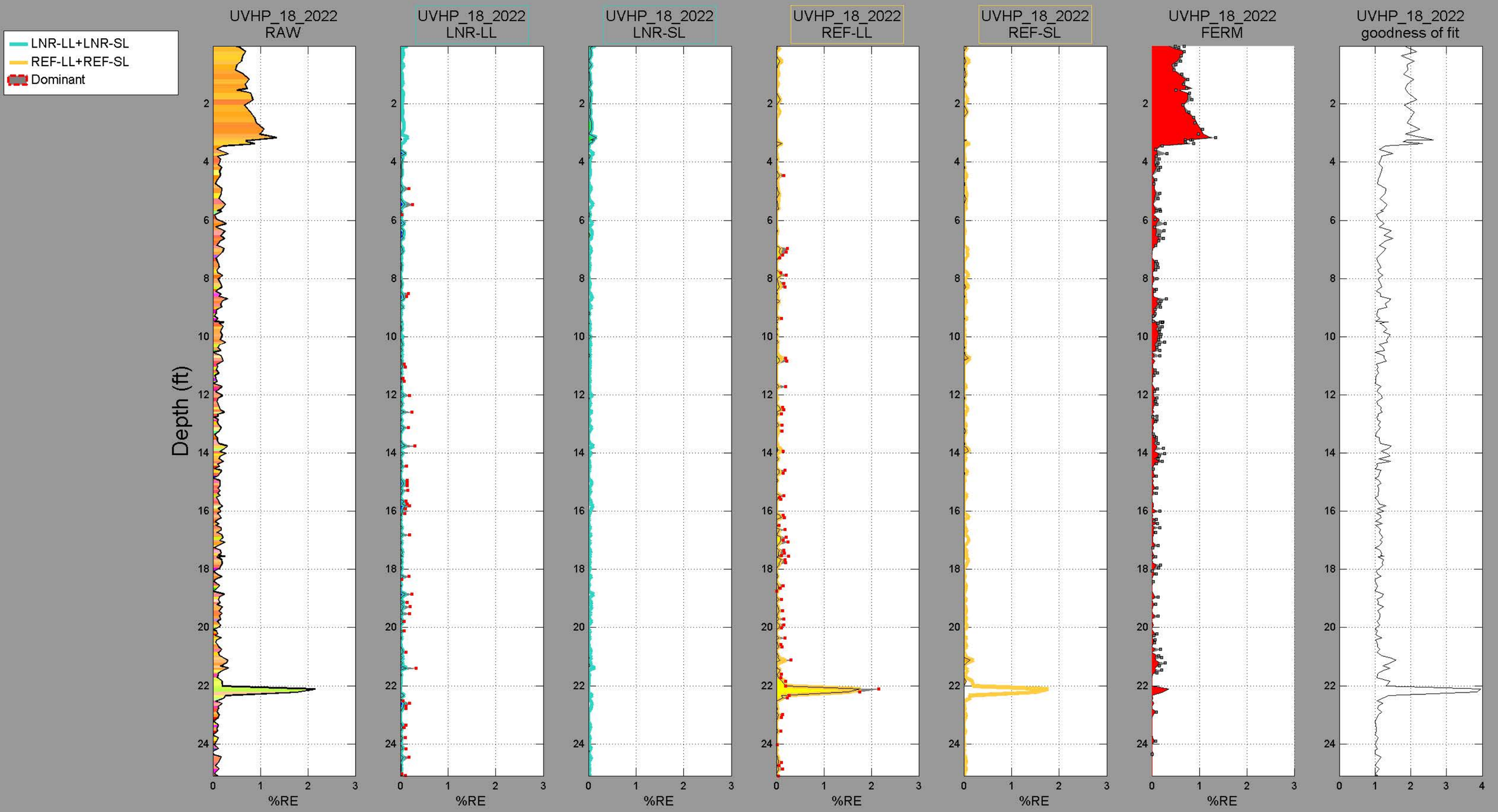


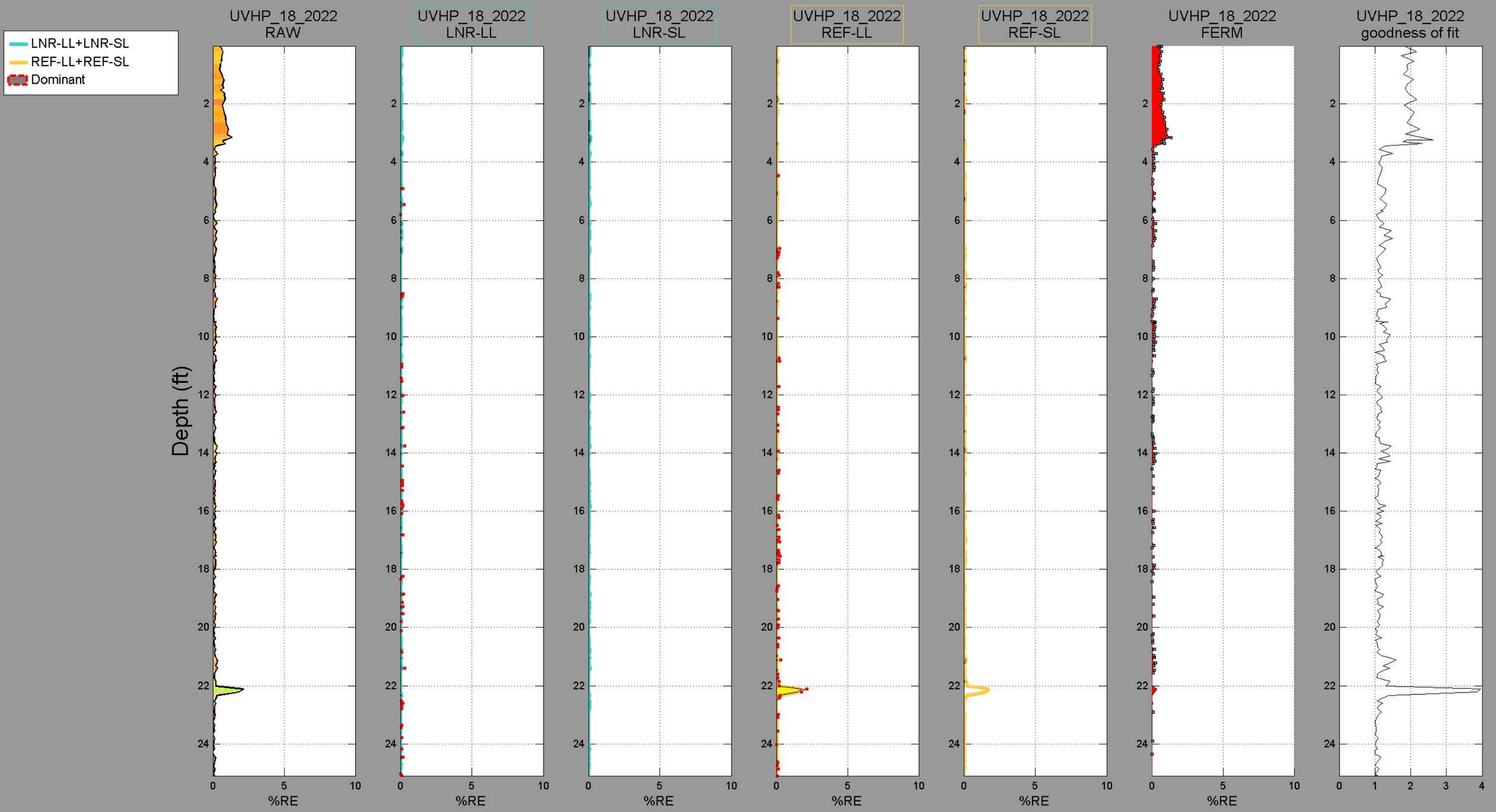




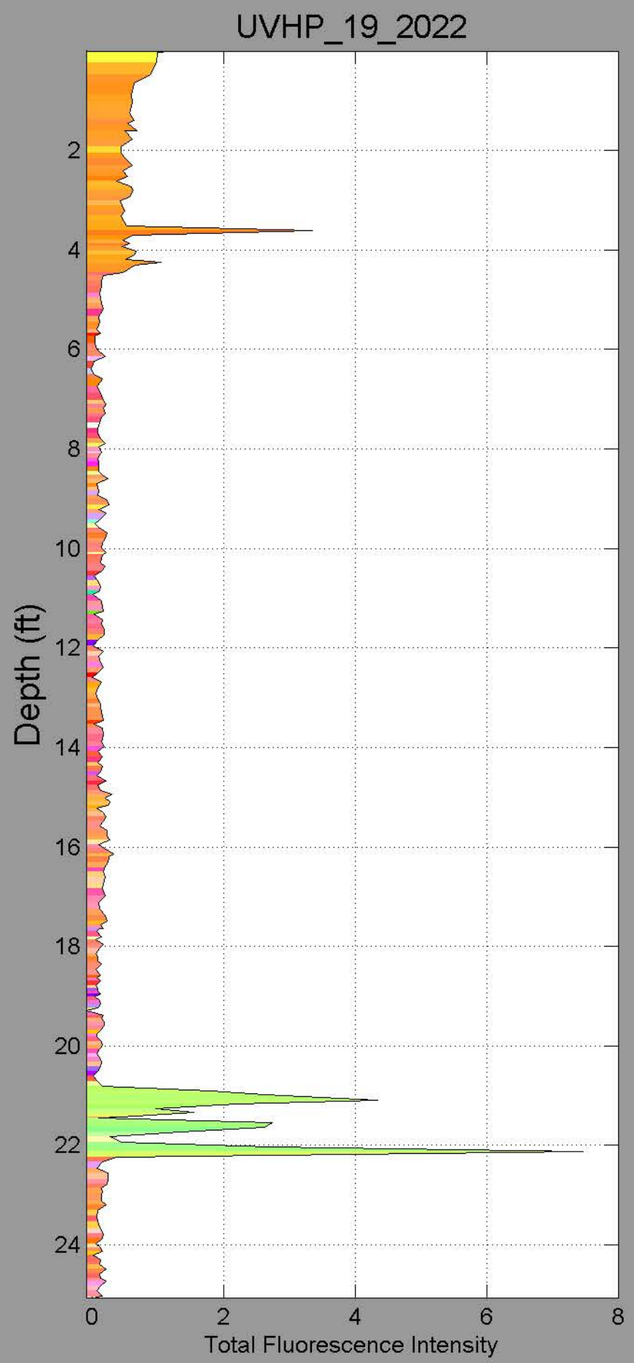


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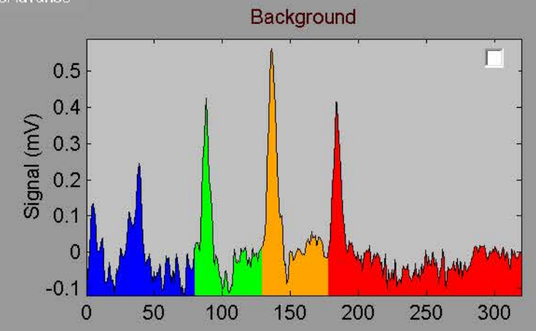

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REF-LL+REF-SL
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UVHP_18_2022
RAW
UVHP_18_2022
LNR-LL
UVHP_18_2022
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REF-LL
UVHP_18_2022
REF-SL
UVHP_18_2022
FERM
UVHP_18_2022
goodness of fit
Depth (ft)
%RE
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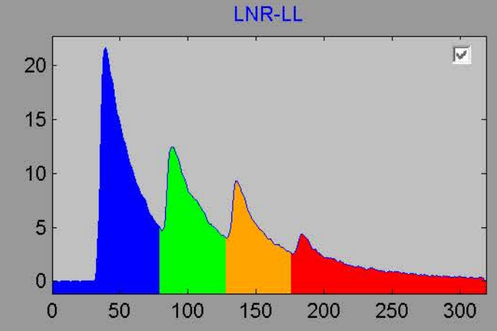


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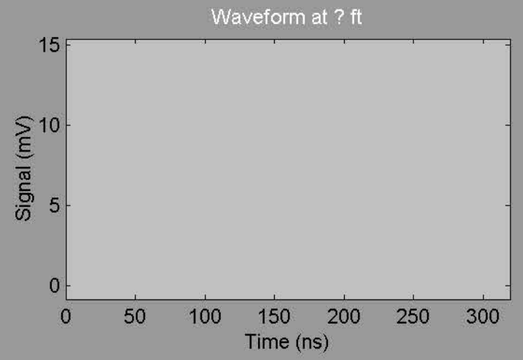


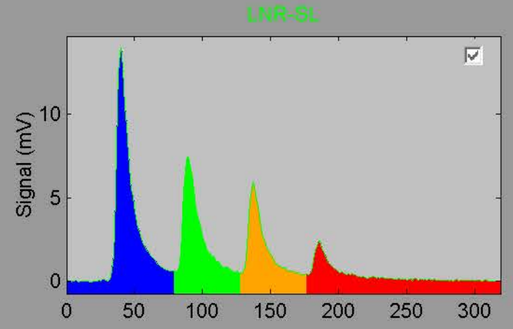
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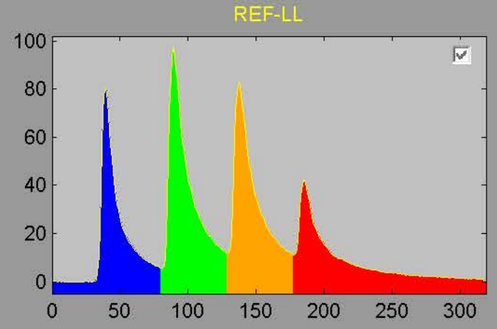




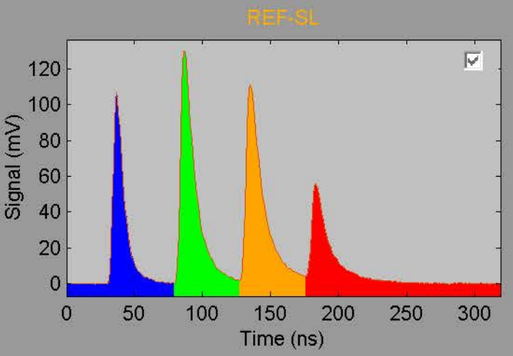
auto bkgd subtract NNLS on load

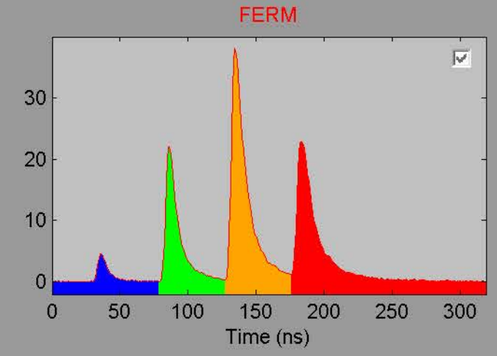




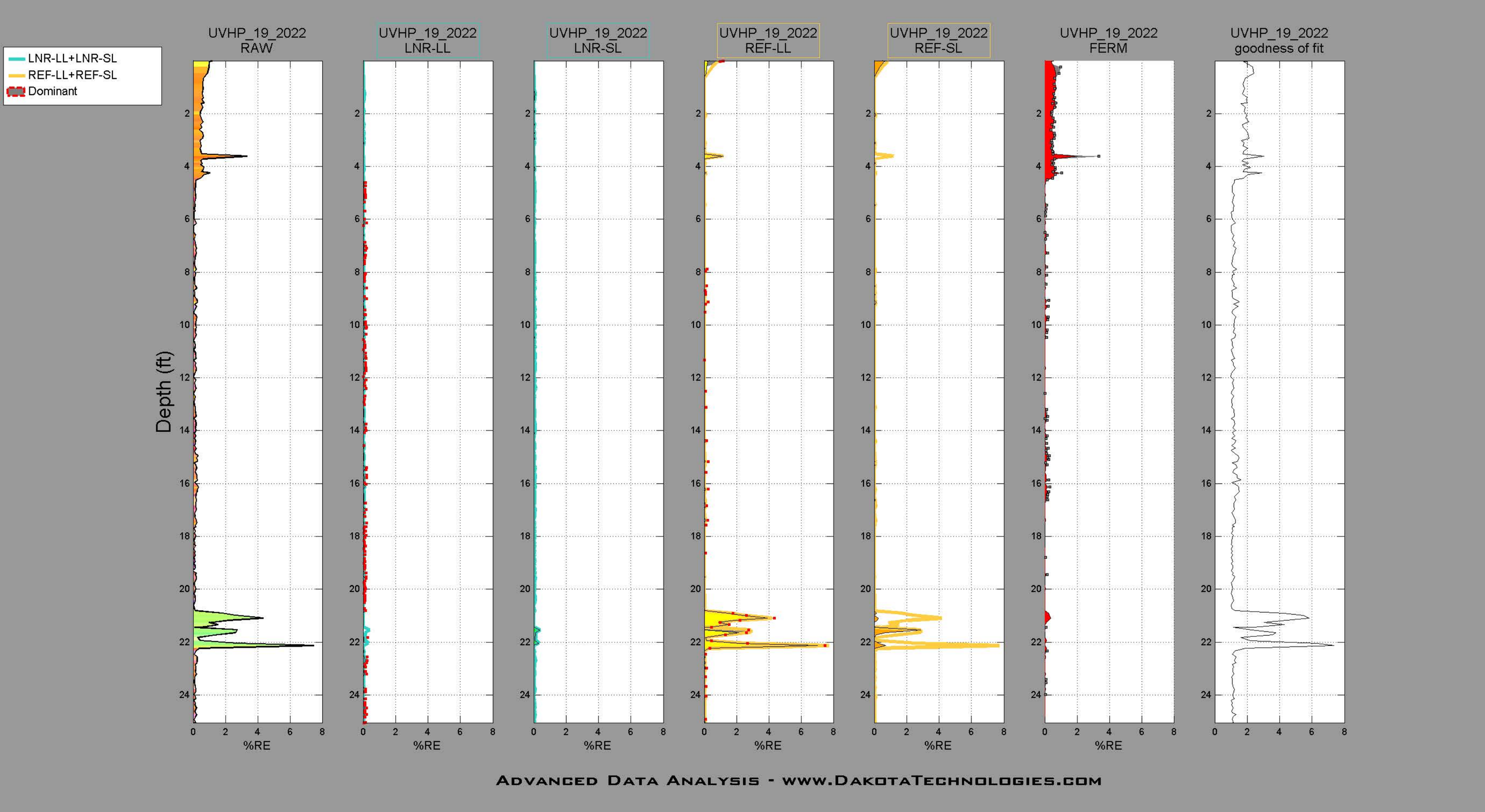


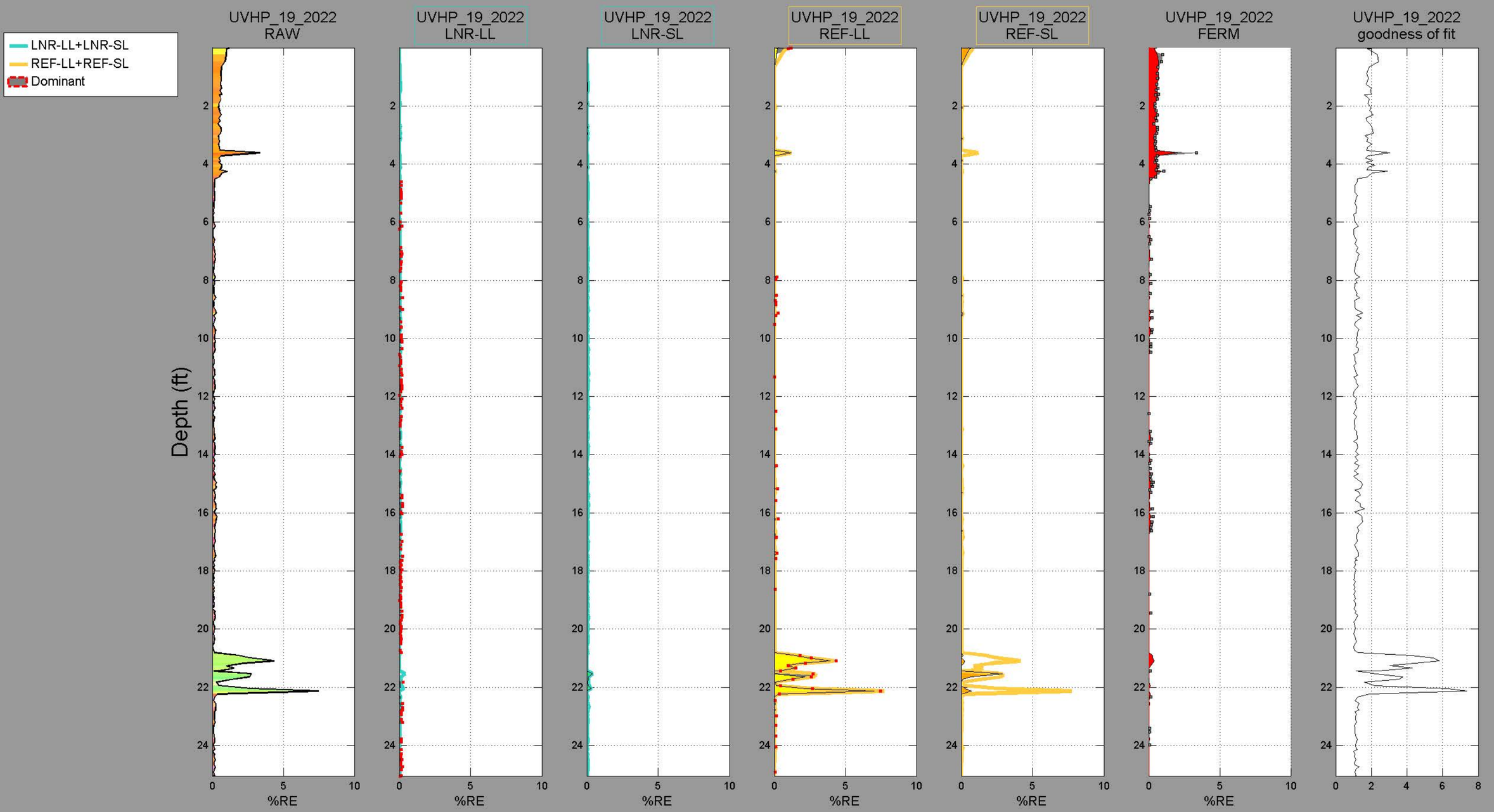


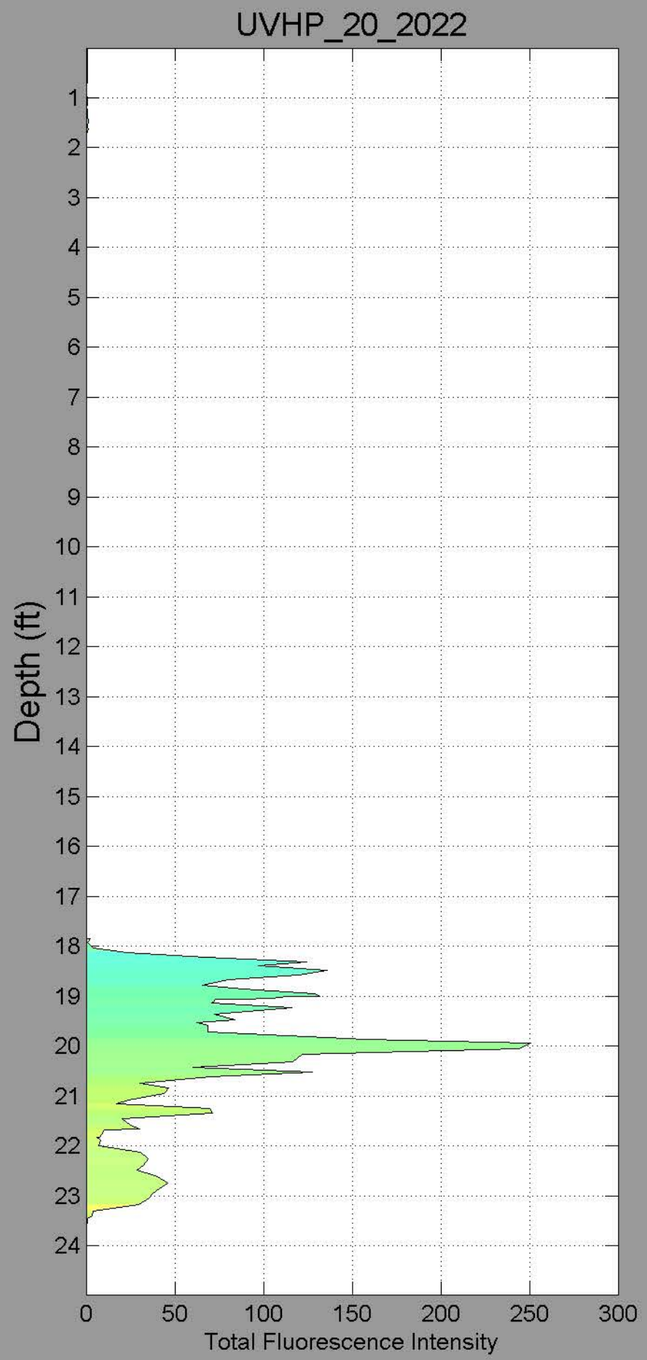




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LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_19_2022
RAW
UVHP_19_2022
LNR-LL
UVHP_19_2022
LNR-SL
UVHP_19_2022
REF-LL
UVHP_19_2022
REF-SL
UVHP_19_2022
FERM
UVHP_19_2022
goodness of fit
Depth (ft)
%RE
Advanced Data Analysis - www.DakotaTechnologies.com

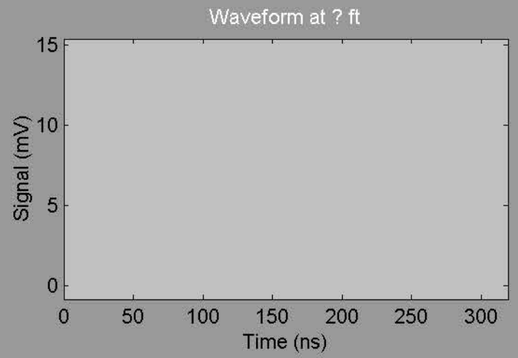

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REF-LL+REF-SL
Dominant
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RAW
UVHP_19_2022
LNR-LL
UVHP_19_2022
LNR-SL
UVHP_19_2022
REF-LL
UVHP_19_2022
REF-SL
UVHP_19_2022
FERM
UVHP_19_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
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%RE
%RE
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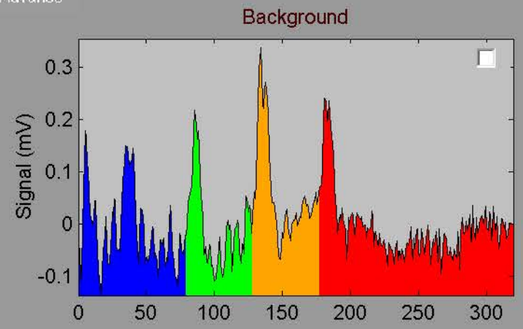
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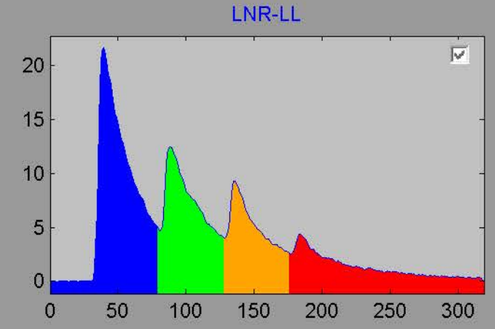
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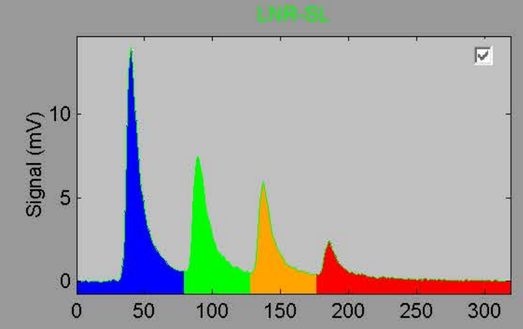
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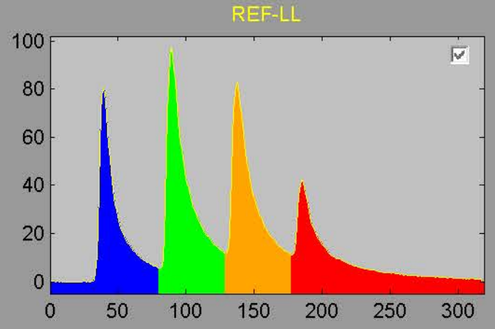


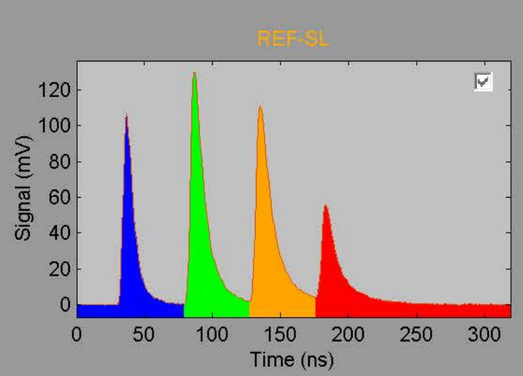


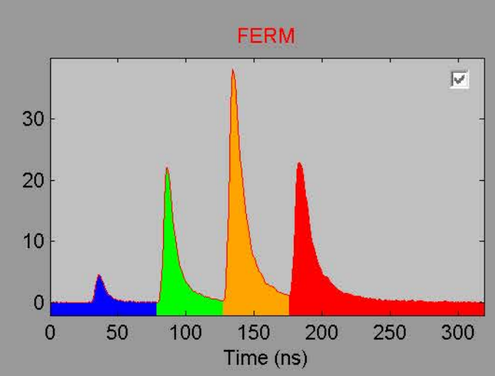




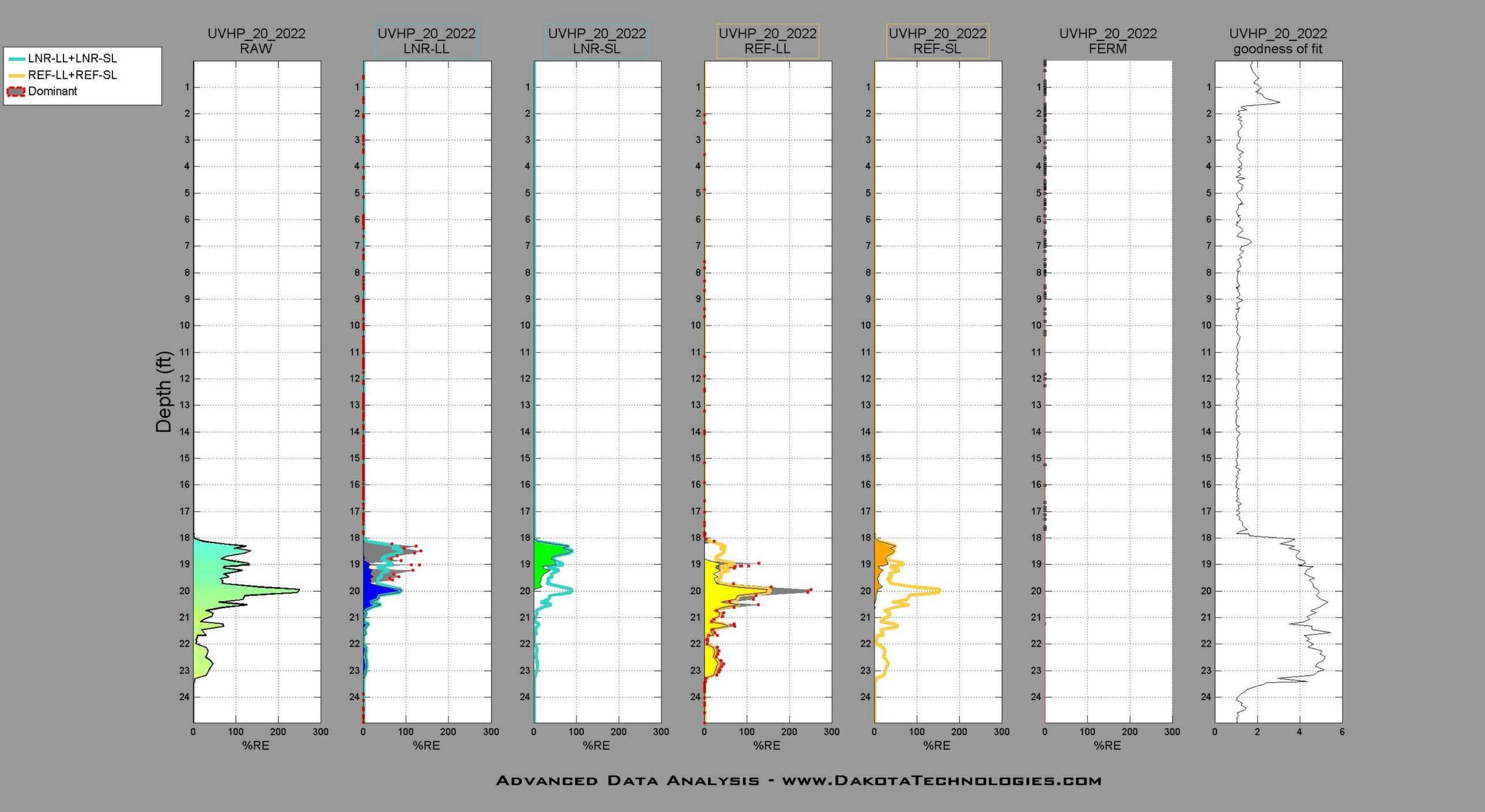


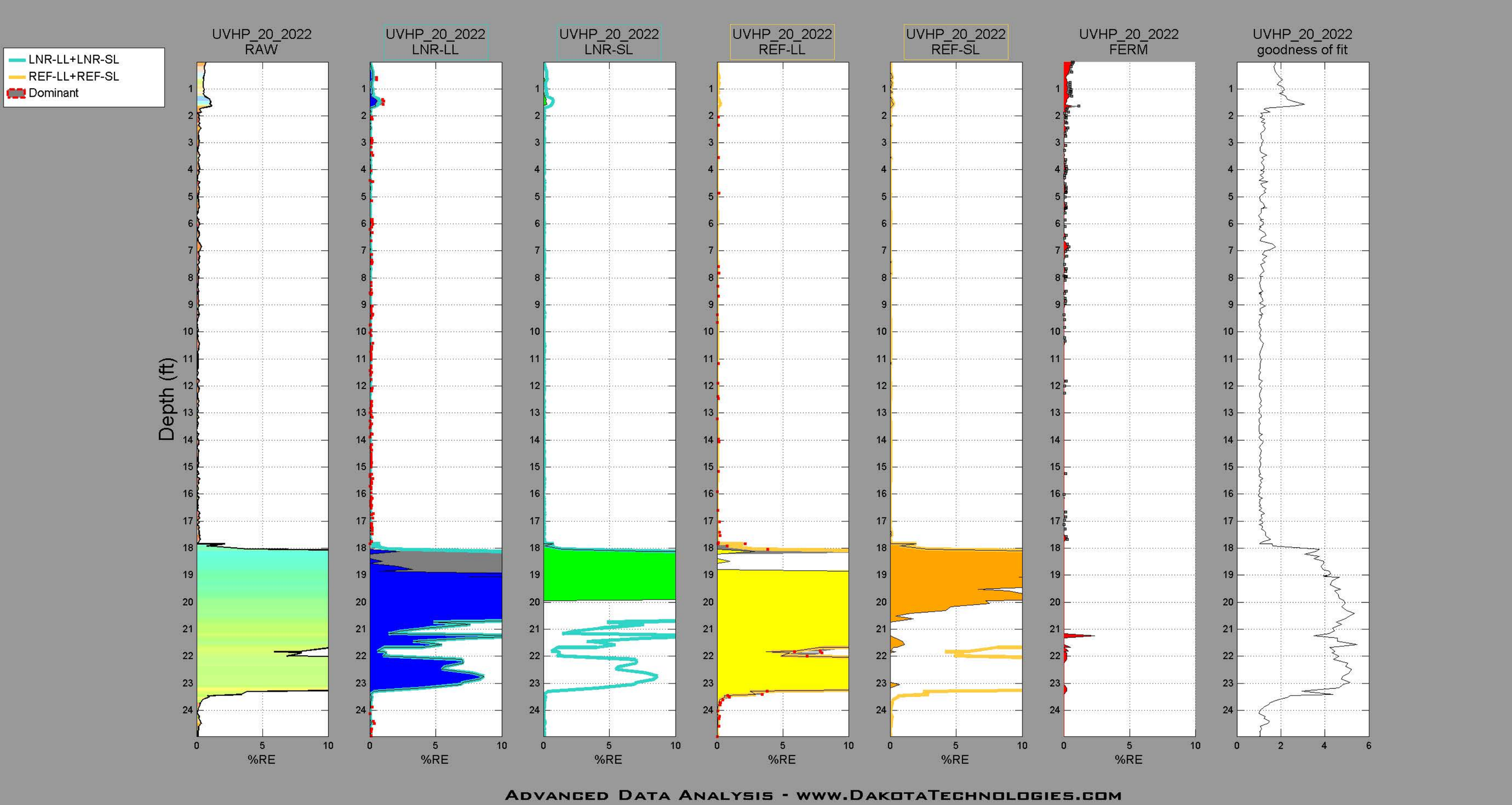


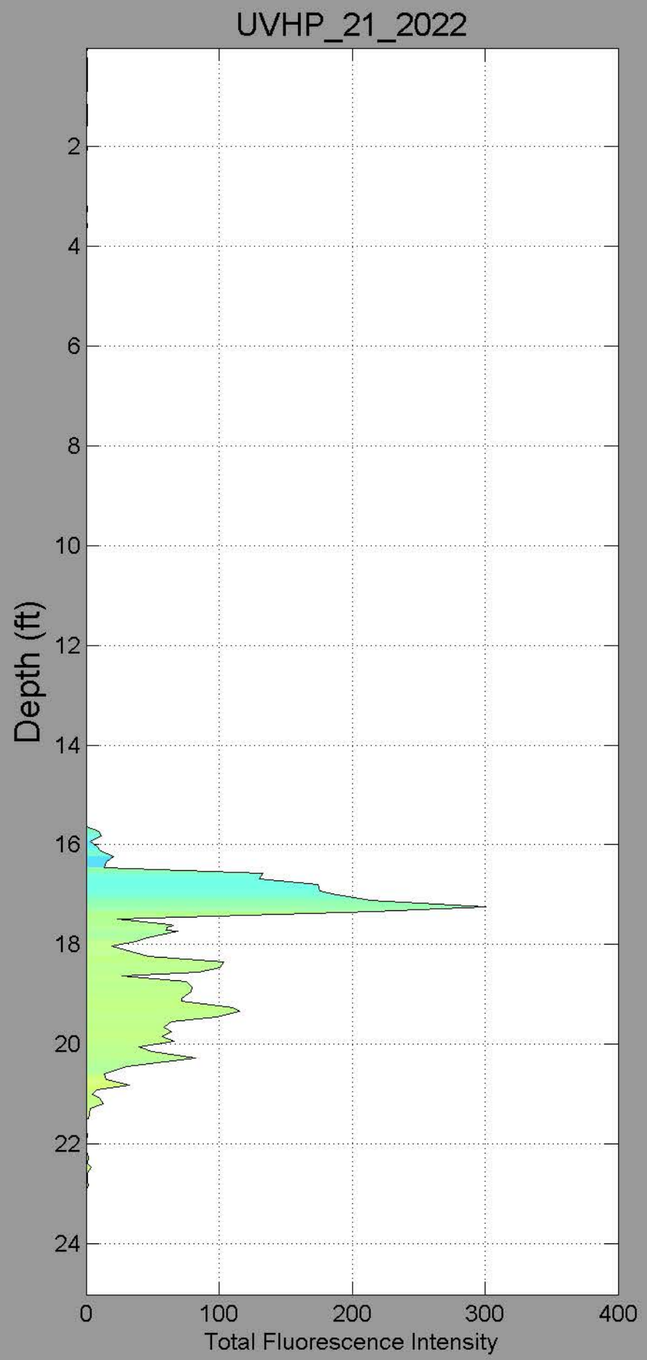




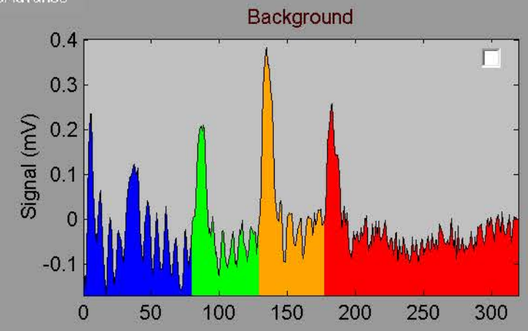
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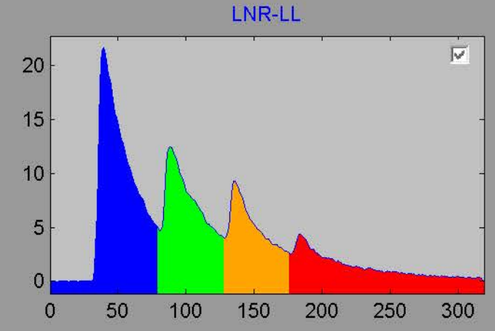

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REF-LL+REF-SL
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RAW
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LNR-LL
UVHP_20_2022
LNR-SL
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UVHP_20_2022
REF-SL
UVHP_20_2022
FERM
UVHP_20_2022
goodness of fit
Depth (ft)
%RE
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LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_20_2022
RAW
UVHP_20_2022
LNR-LL
UVHP_20_2022
LNR-SL
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FERM
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goodness of fit
Depth (ft)
%RE
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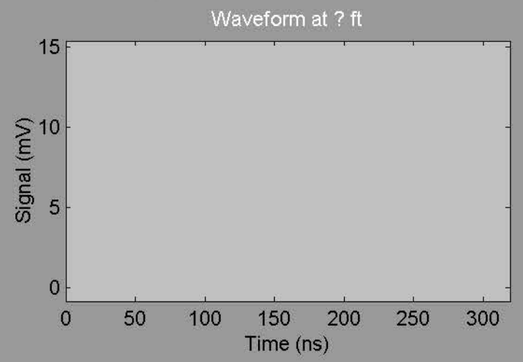


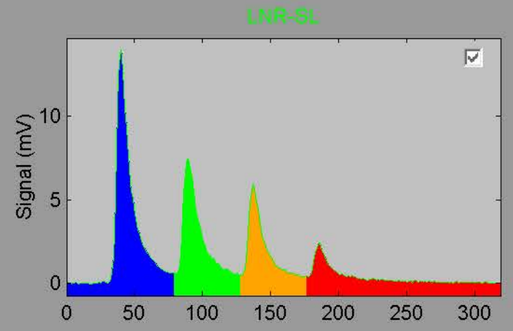
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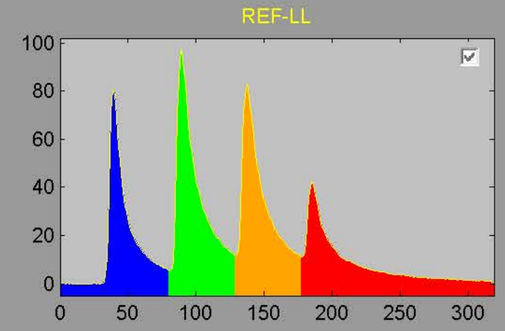




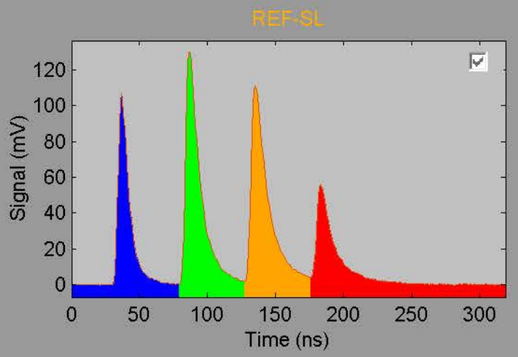
auto bkgd subtract NNLS on load

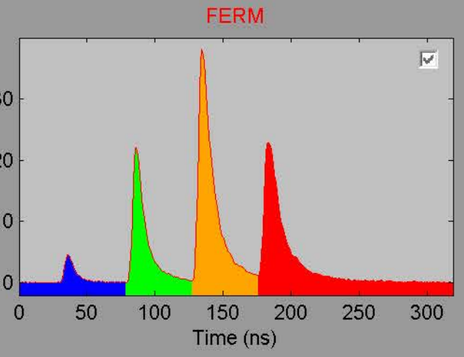




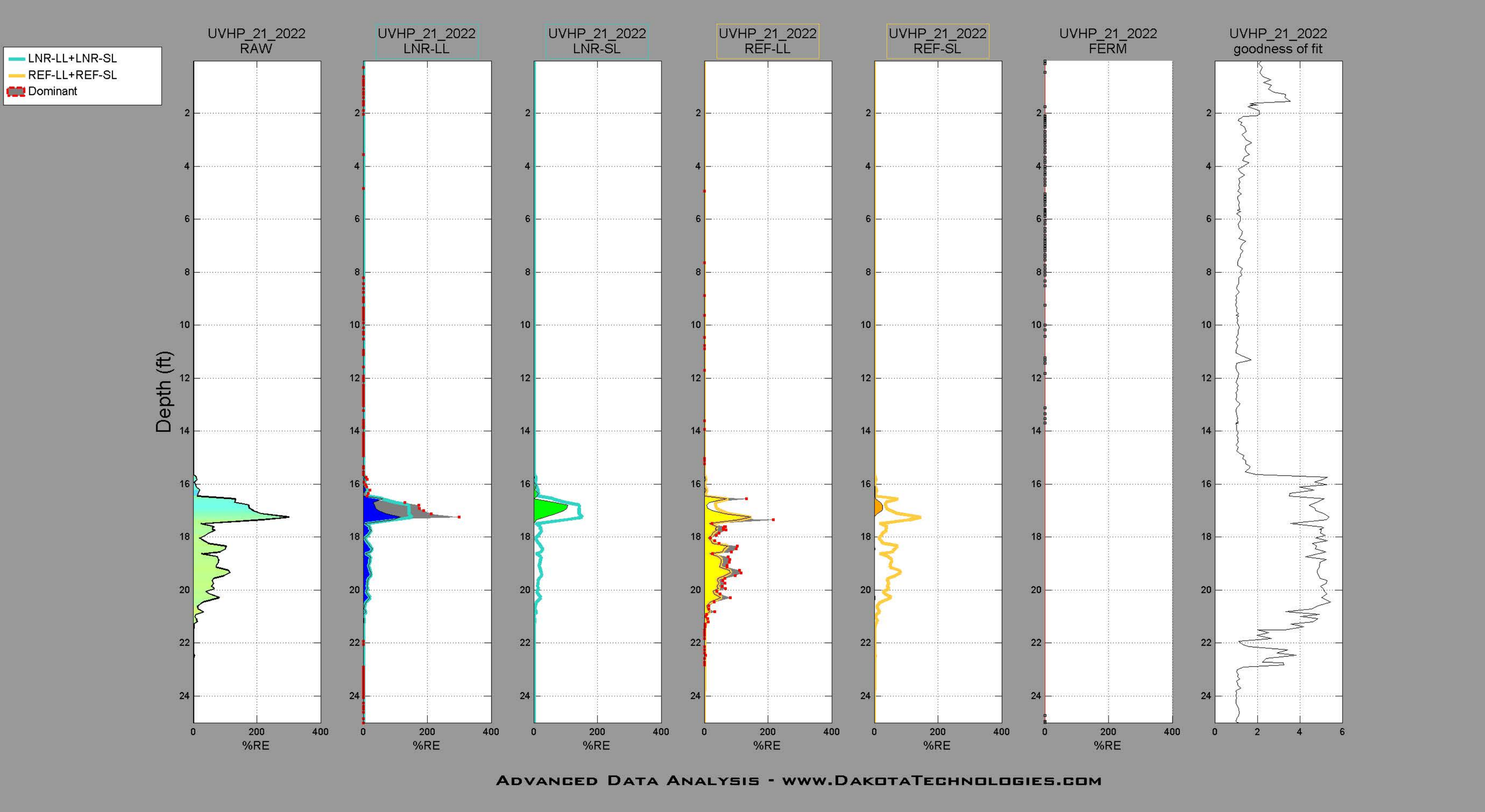


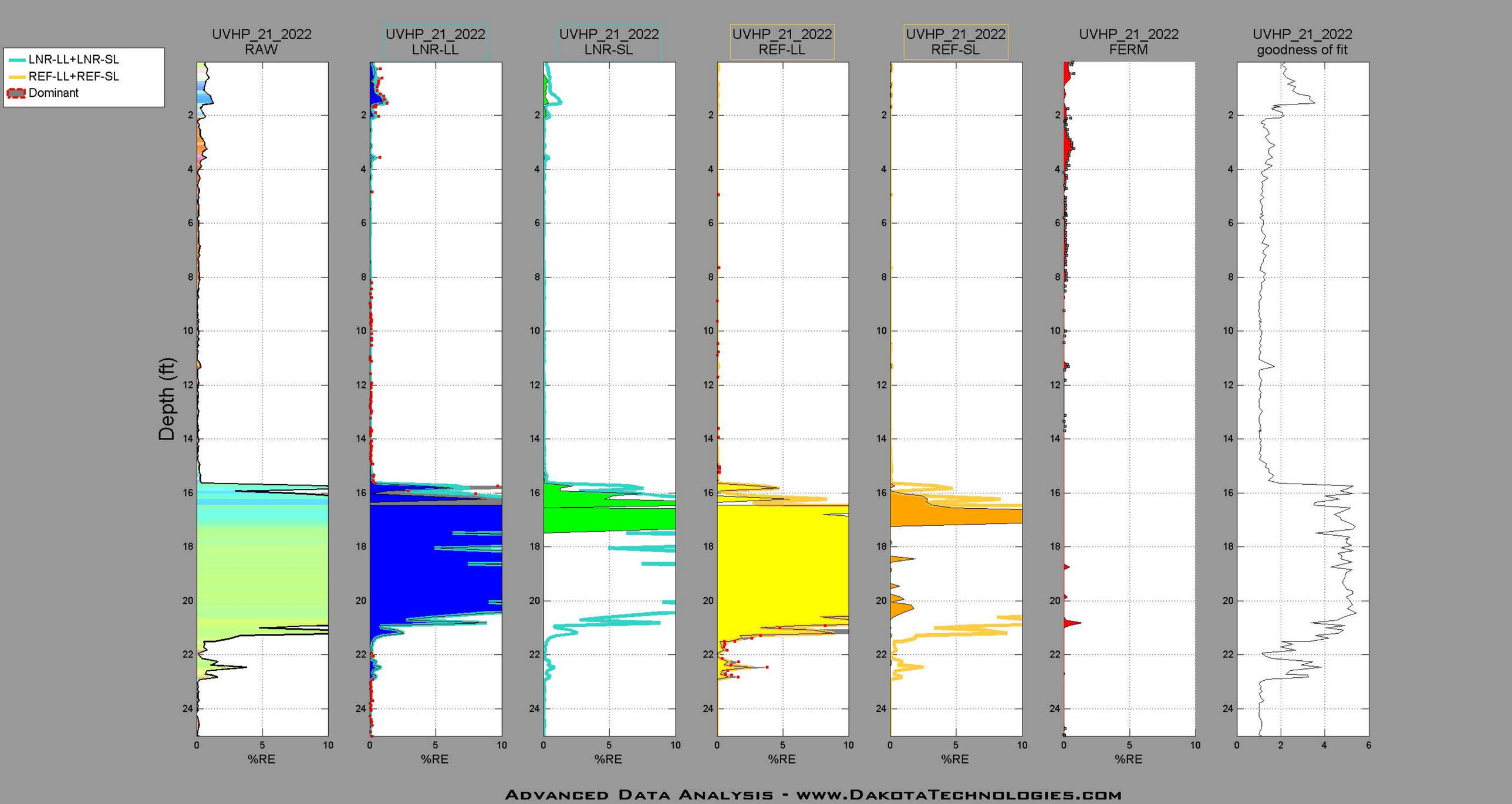


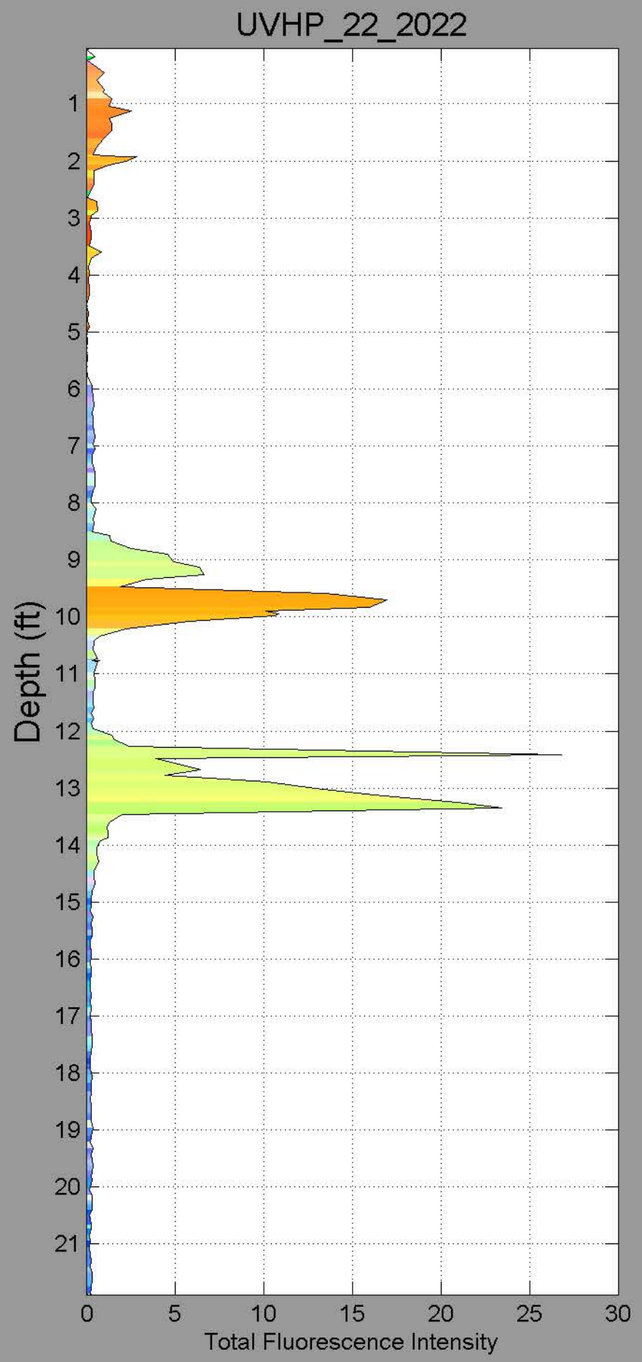




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LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_21_2022
RAW
UVHP_21_2022
LNR-LL
UVHP_21_2022
LNR-SL
UVHP_21_2022
REF-LL
UVHP_21_2022
REF-SL
UVHP_21_2022
FERM
UVHP_21_2022
goodness of fit
Depth (ft)
%RE
Advanced Data Analysis - www.DakotaTechnologies.com

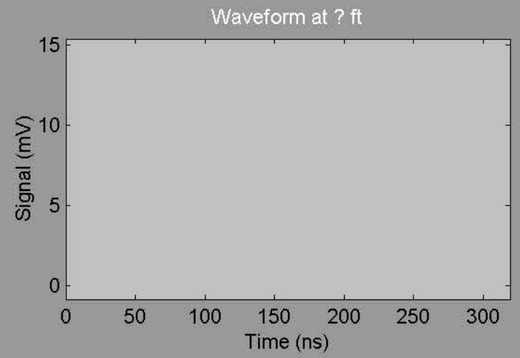

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REF-LL+REF-SL
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UVHP_21_2022
RAW
UVHP_21_2022
LNR-LL
UVHP_21_2022
LNR-SL
UVHP_21_2022
REF-LL
UVHP_21_2022
REF-SL
UVHP_21_2022
FERM
UVHP_21_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
%RE
%RE
Advanced Data Analysis - www.DakotaTechnologies.com



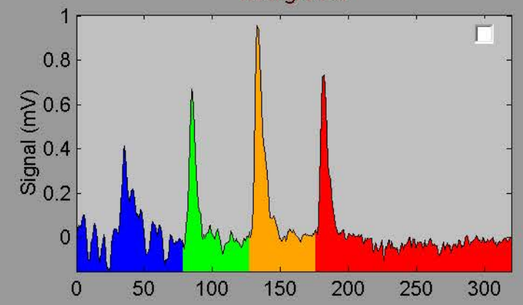
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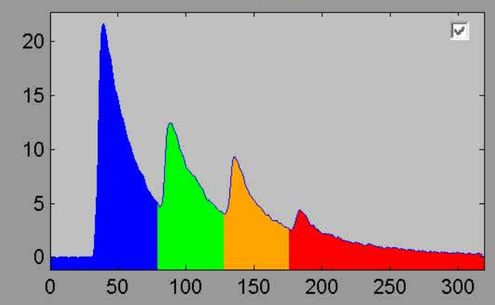
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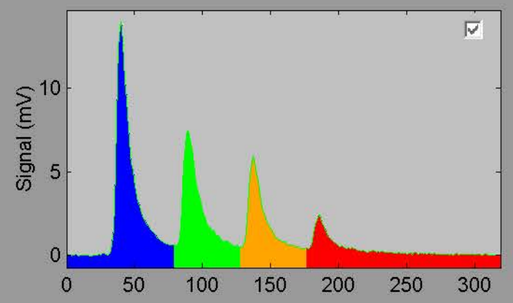
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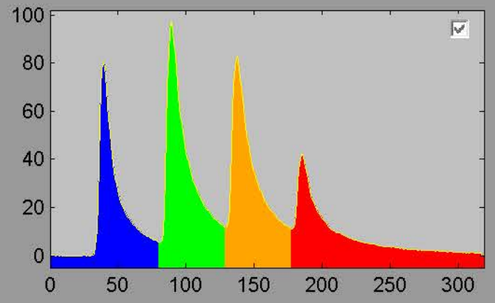


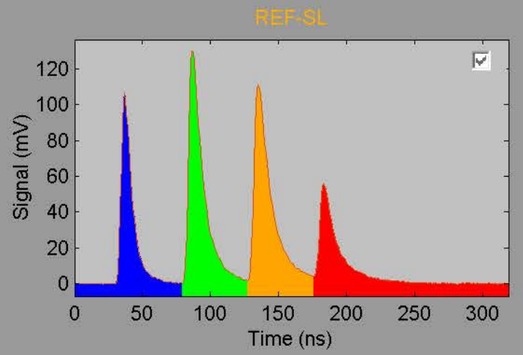


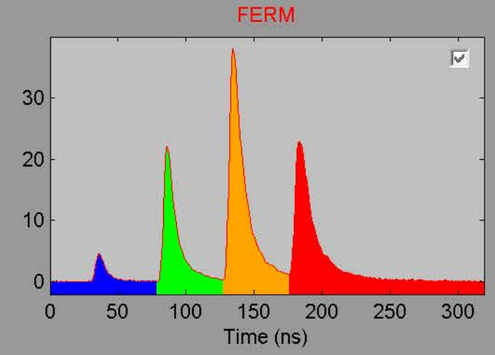




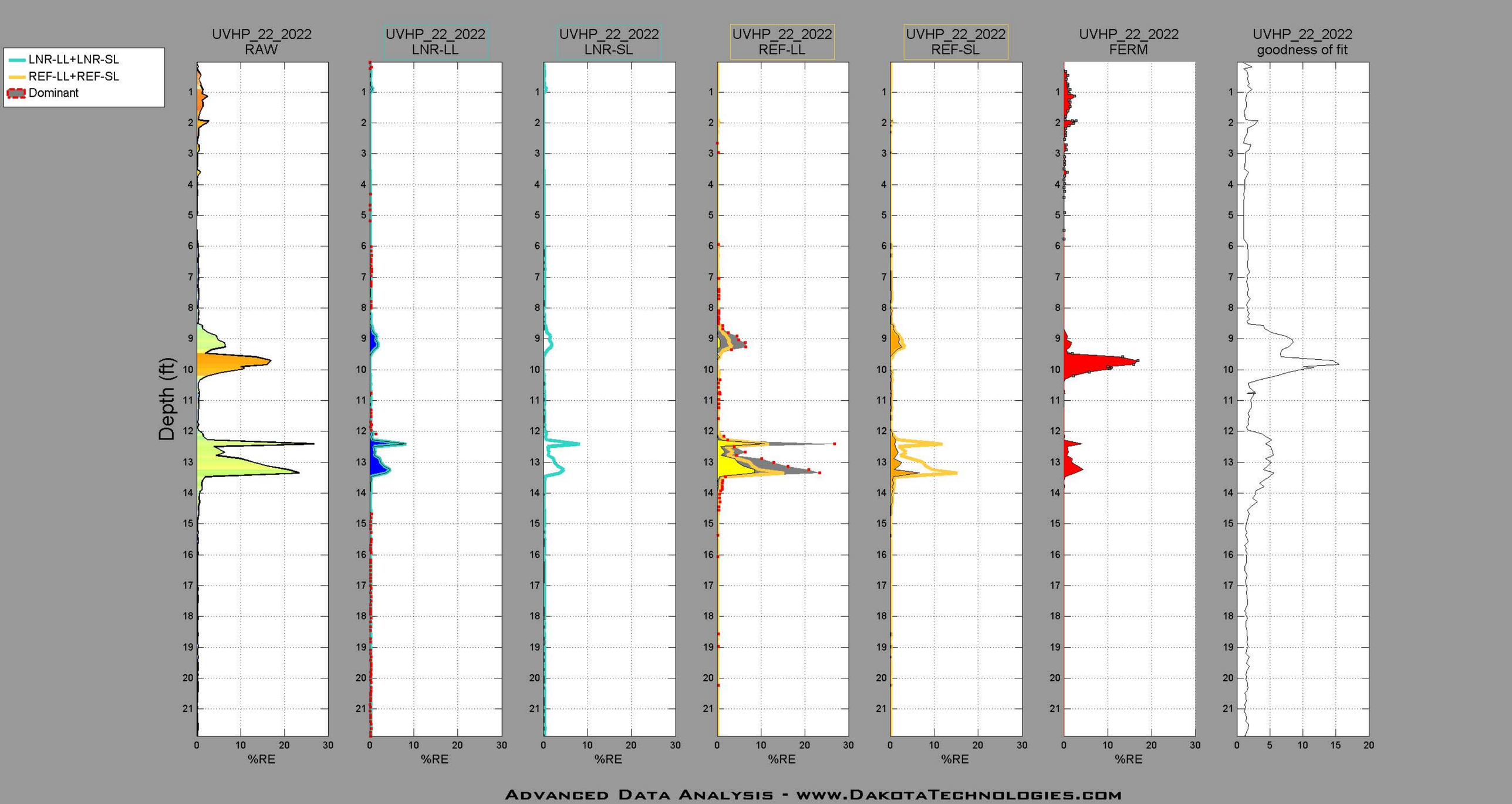


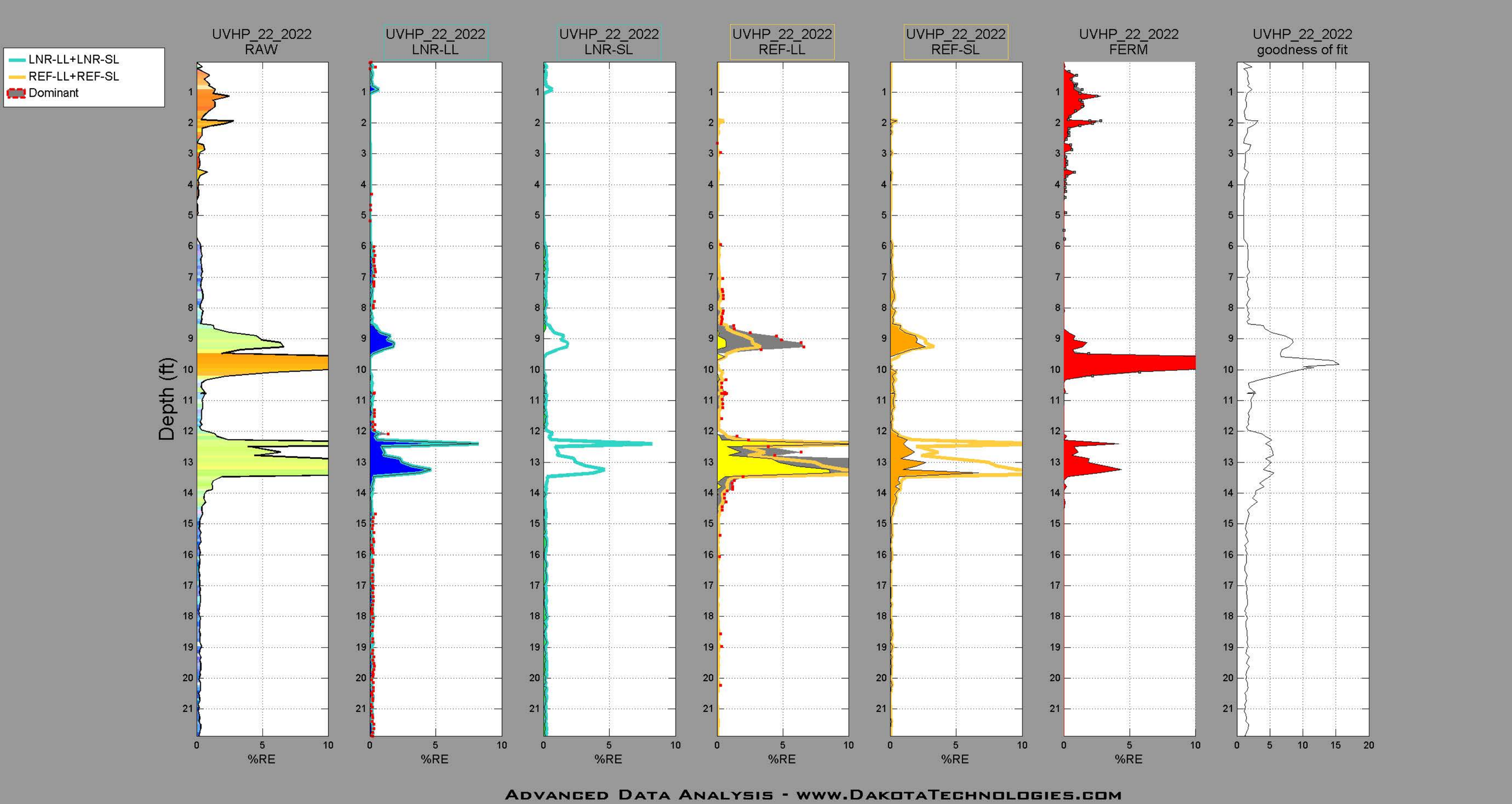


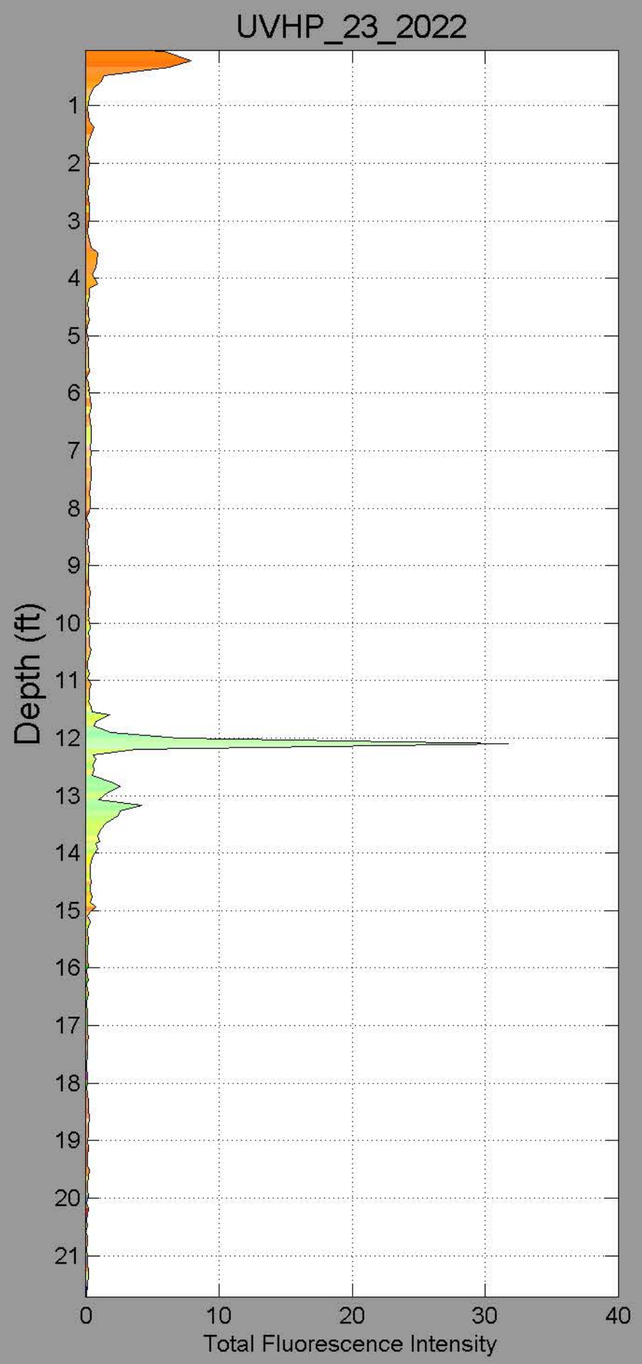




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LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_22_2022
RAW
UVHP_22_2022
LNR-LL
UVHP_22_2022
LNR-SL
UVHP_22_2022
REF-LL
UVHP_22_2022
REF-SL
UVHP_22_2022
FERM
UVHP_22_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
%RE
%RE
%RE
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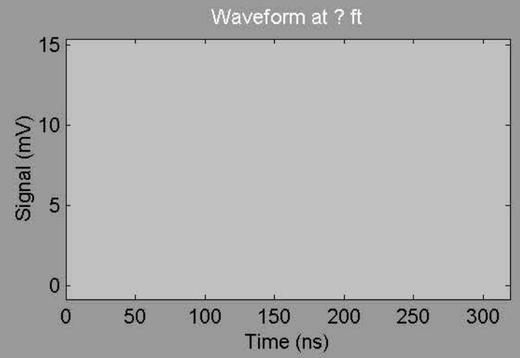

LNR-LL+LNR-SL
REF-LL+REF-SL
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RAW
UVHP_22_2022
LNR-LL
UVHP_22_2022
LNR-SL
UVHP_22_2022
REF-LL
UVHP_22_2022
REF-SL
UVHP_22_2022
FERM
UVHP_22_2022
goodness of fit
Depth (ft)
%RE
Advanced Data Analysis - www.DakotaTechnologies.com



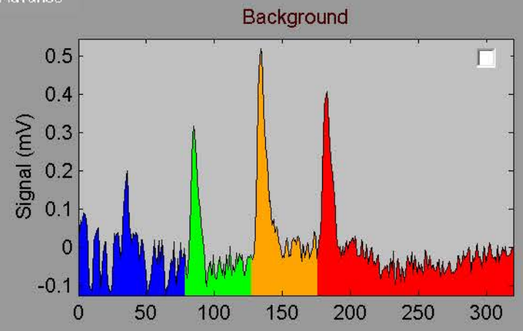
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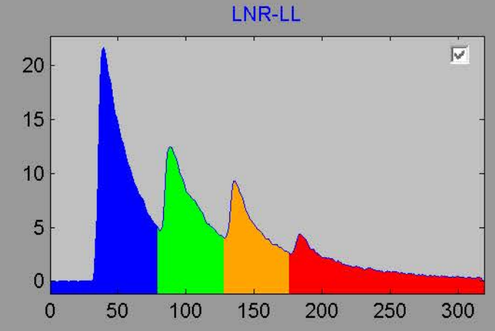
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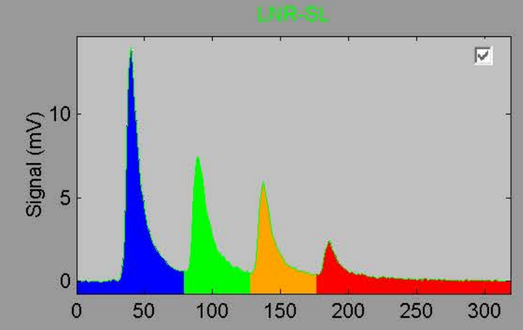
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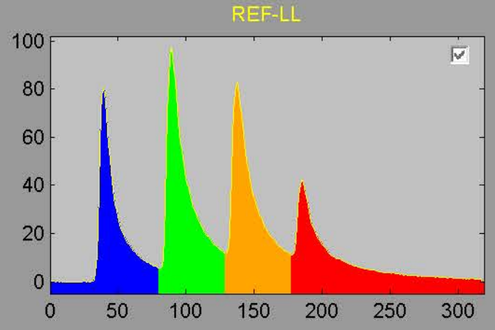


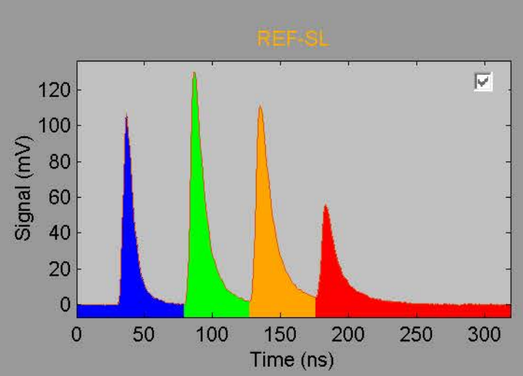


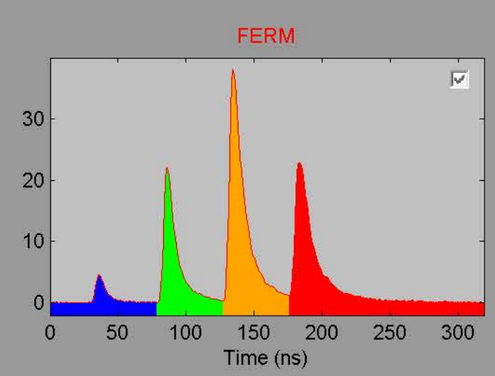




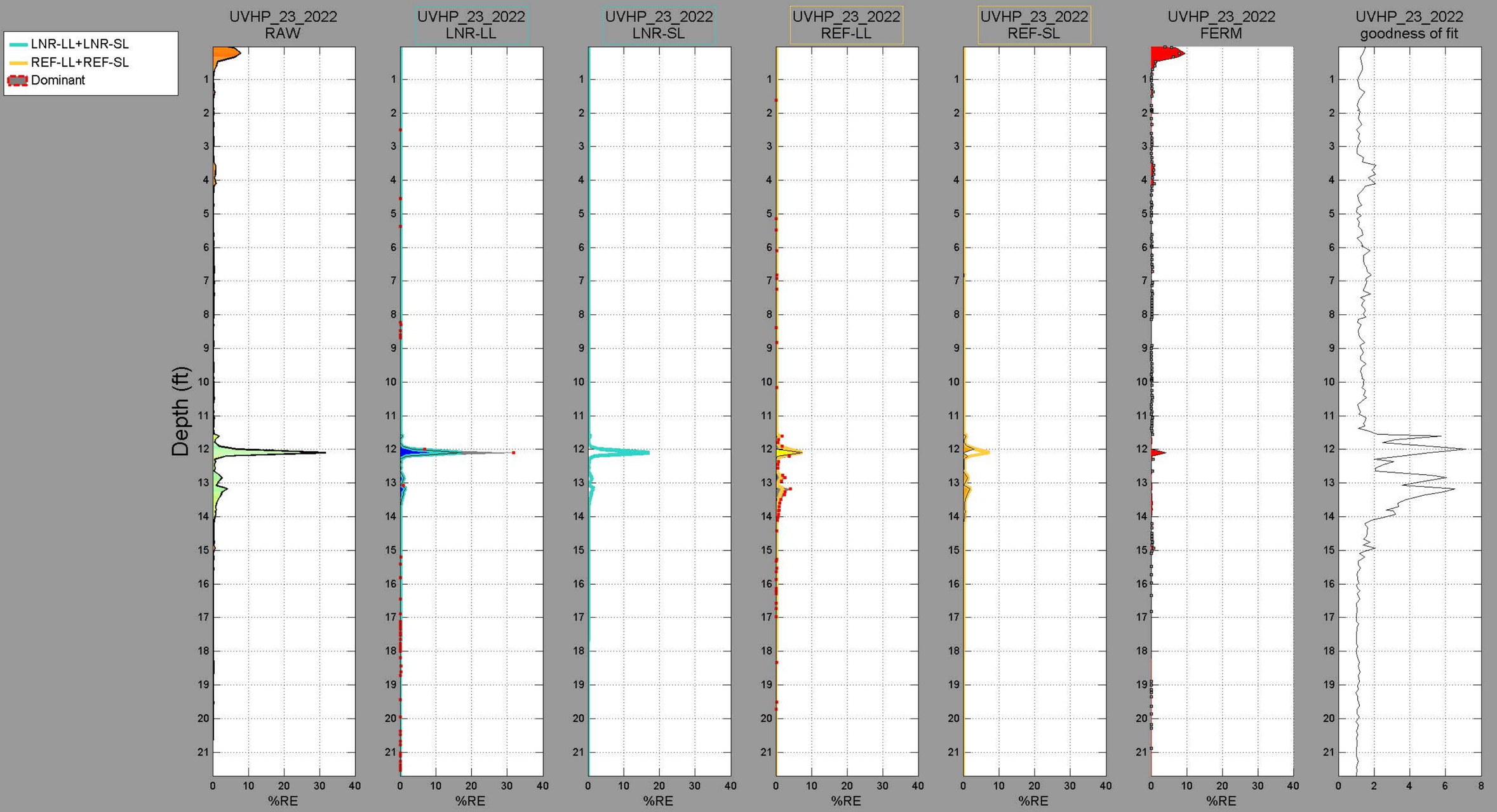


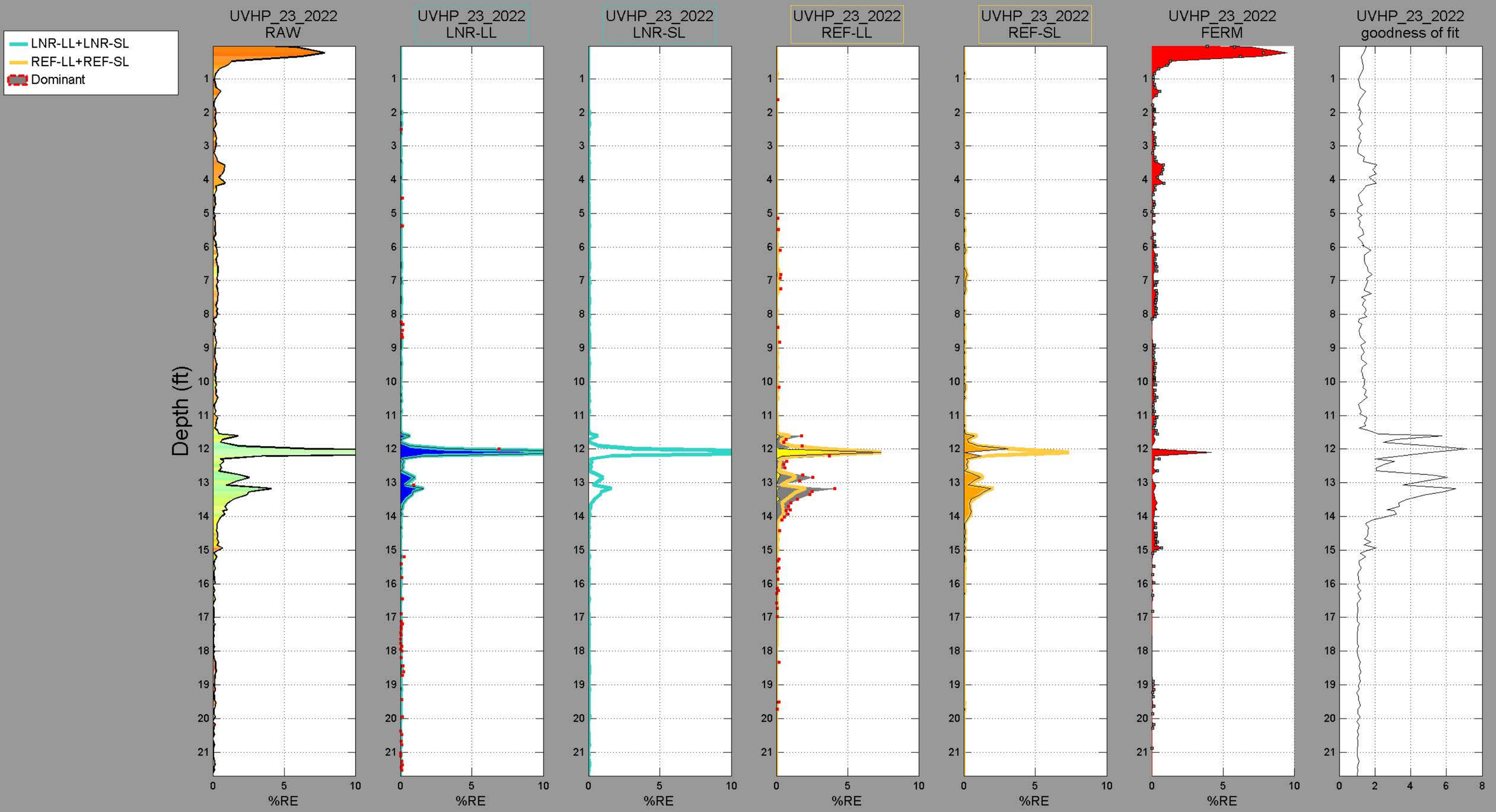


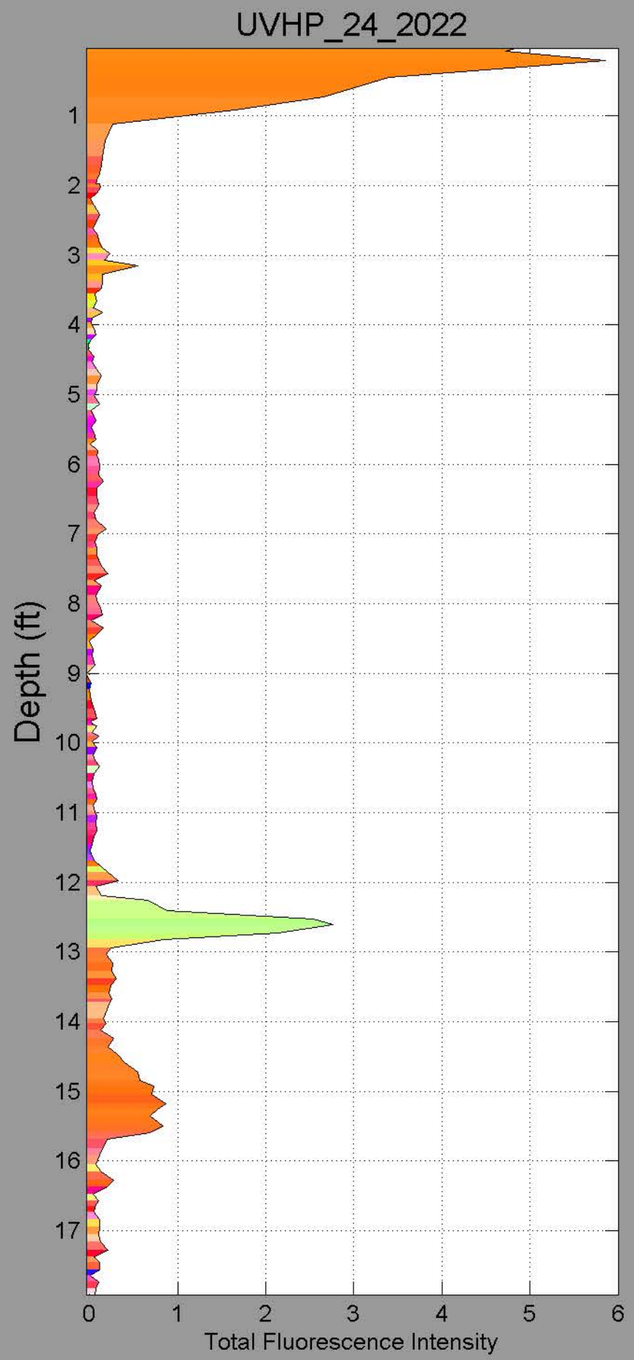




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LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
UVHP_23_2022
RAW
UVHP_23_2022
LNR-LL
UVHP_23_2022
LNR-SL
UVHP_23_2022
REF-LL
UVHP_23_2022
REF-SL
UVHP_23_2022
FERM
UVHP_23_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
%RE
%RE
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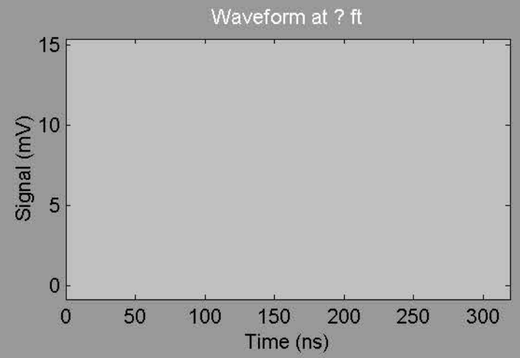

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REF-LL+REF-SL
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RAW
UVHP_23_2022
LNR-LL
UVHP_23_2022
LNR-SL
UVHP_23_2022
REF-LL
UVHP_23_2022
REF-SL
UVHP_23_2022
FERM
UVHP_23_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
%RE
%RE
%RE



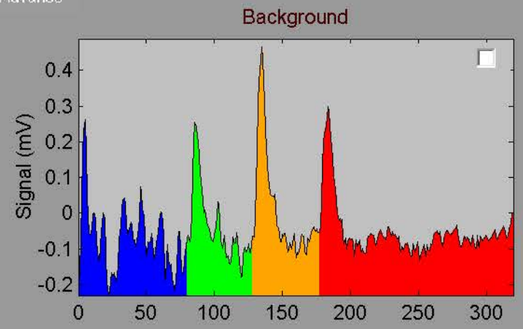
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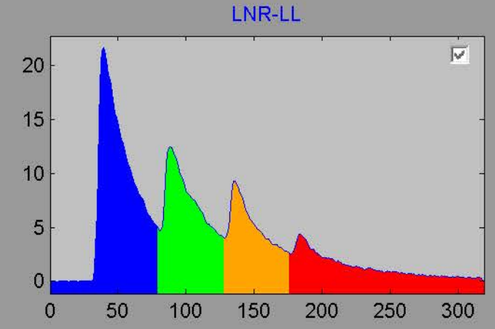
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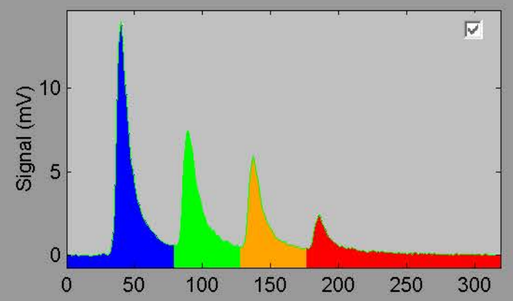
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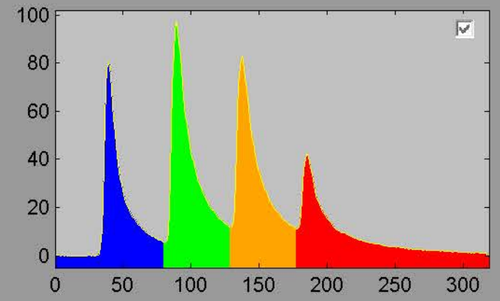


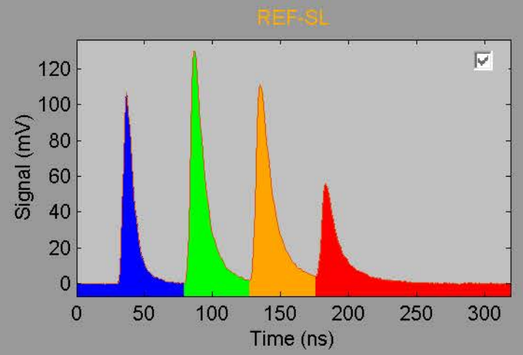


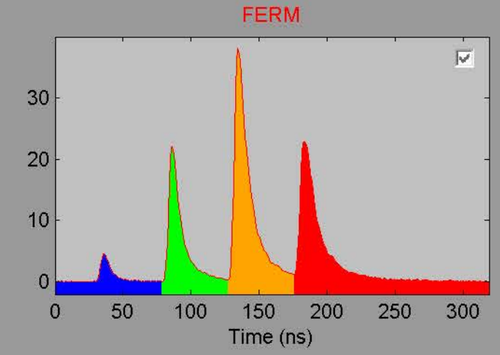




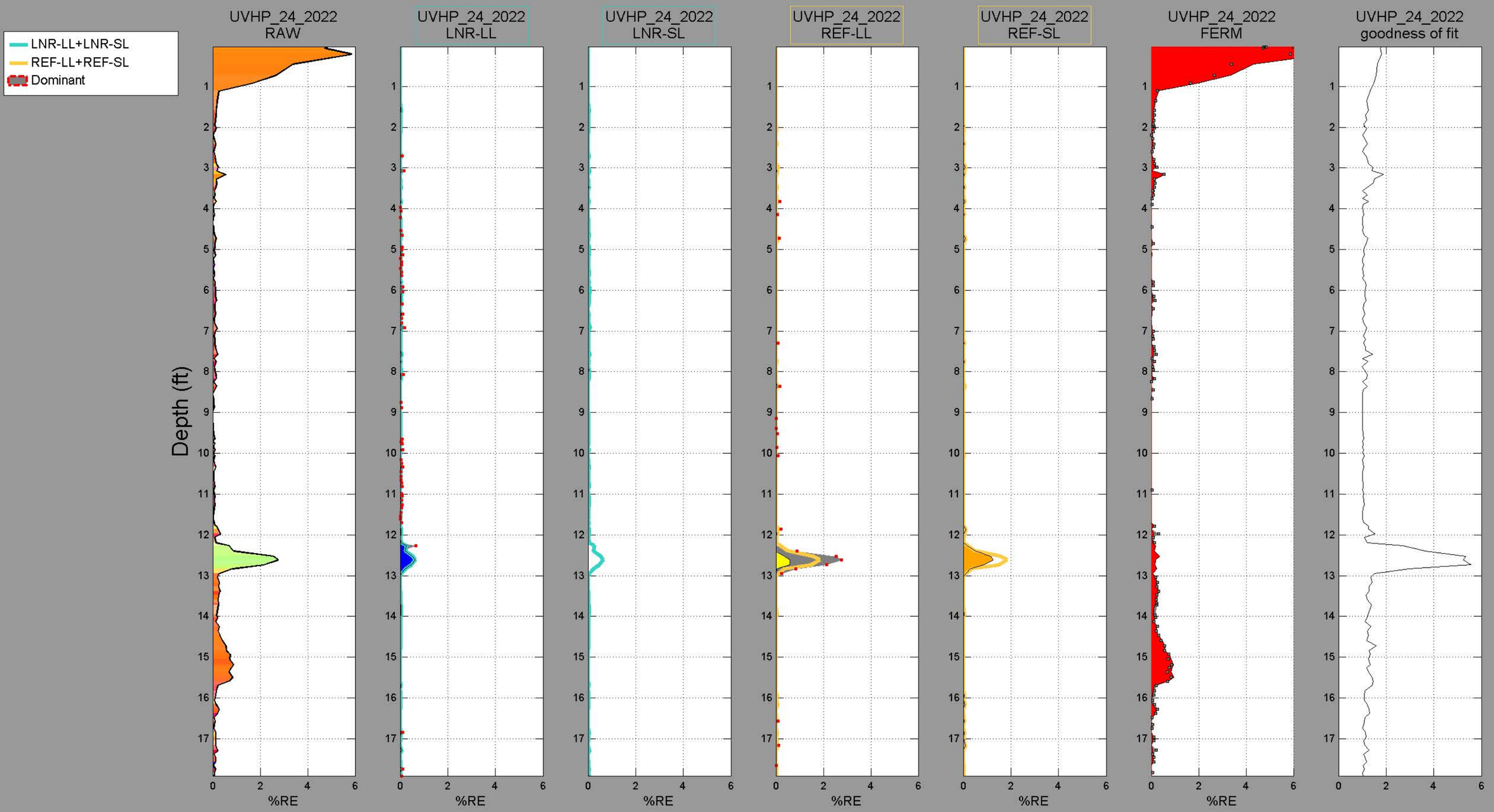


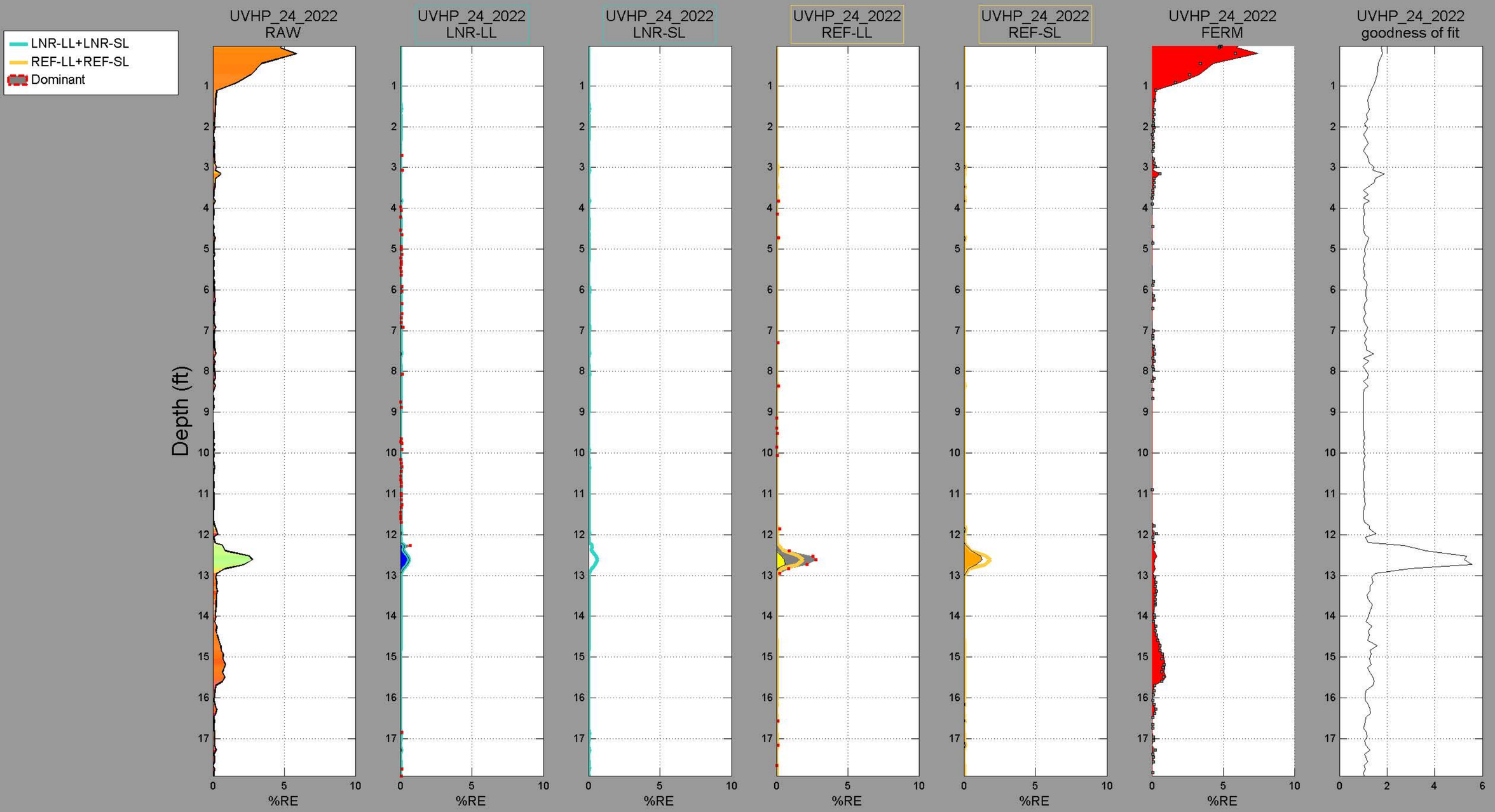




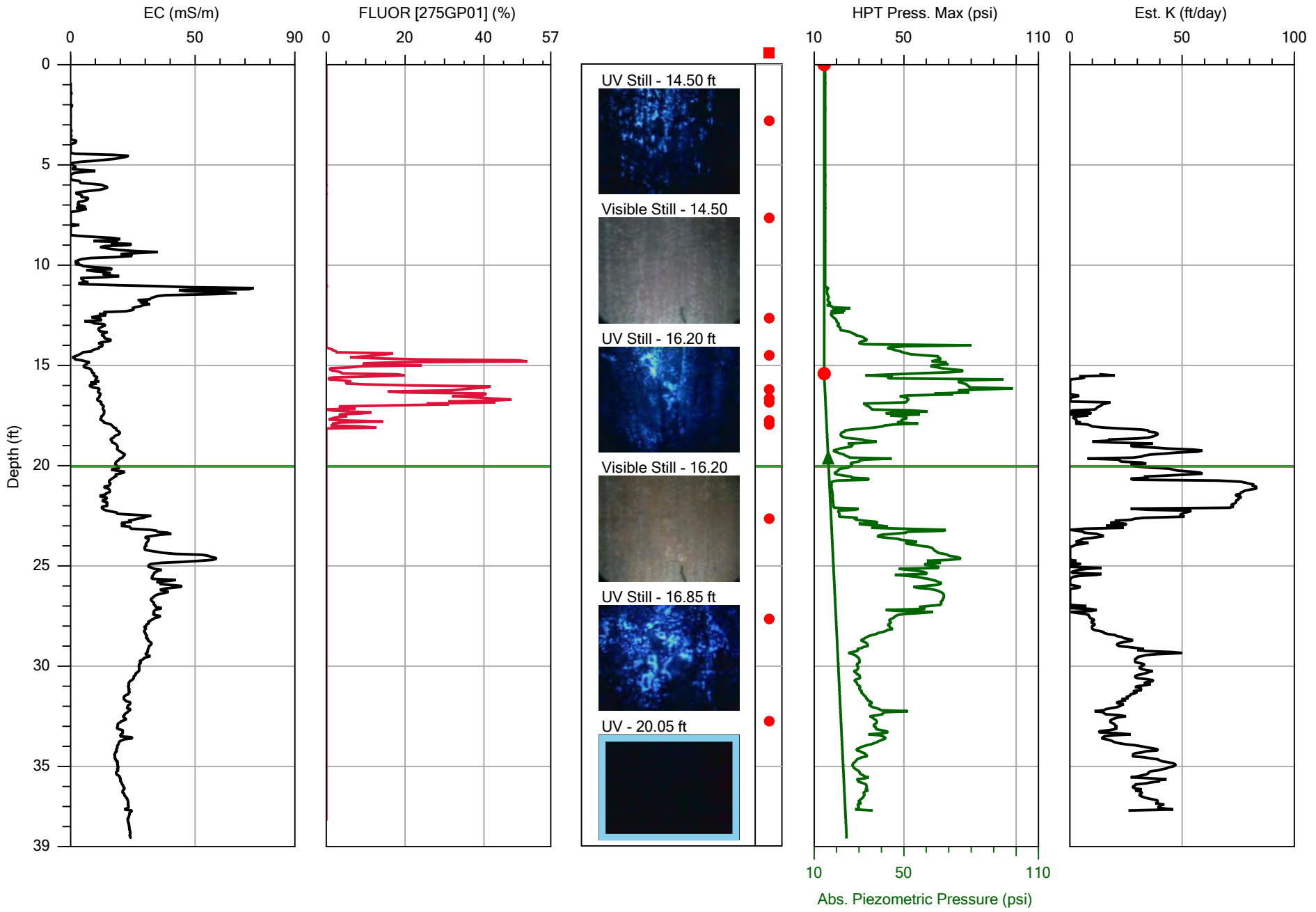


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LNR-LL+LNR-SL
REF-LL+REF-SL
Dominant
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RAW
UVHP_24_2022
LNR-LL
UVHP_24_2022
LNR-SL
UVHP_24_2022
REF-LL
UVHP_24_2022
REF-SL
UVHP_24_2022
FERM
UVHP_24_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
%RE
%RE
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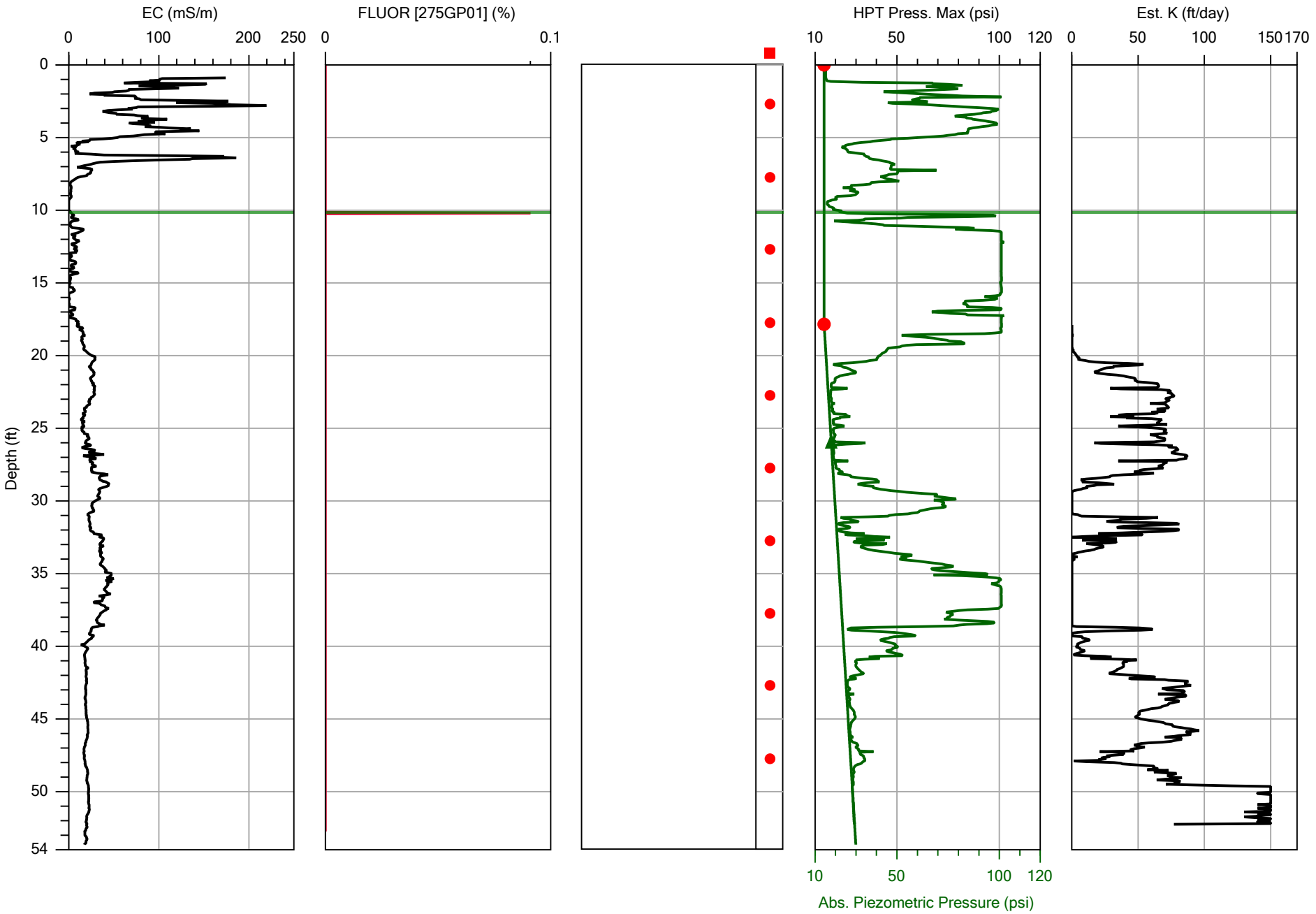

LNR-LL+LNR-SL
REF-LL+REF-SL
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RAW
UVHP_24_2022
LNR-LL
UVHP_24_2022
LNR-SL
UVHP_24_2022
REF-LL
UVHP_24_2022
REF-SL
UVHP_24_2022
FERM
UVHP_24_2022
goodness of fit
Depth (ft)
%RE
%RE
%RE
%RE
%RE
%RE
%RE

Appendix O OiHpt Logs



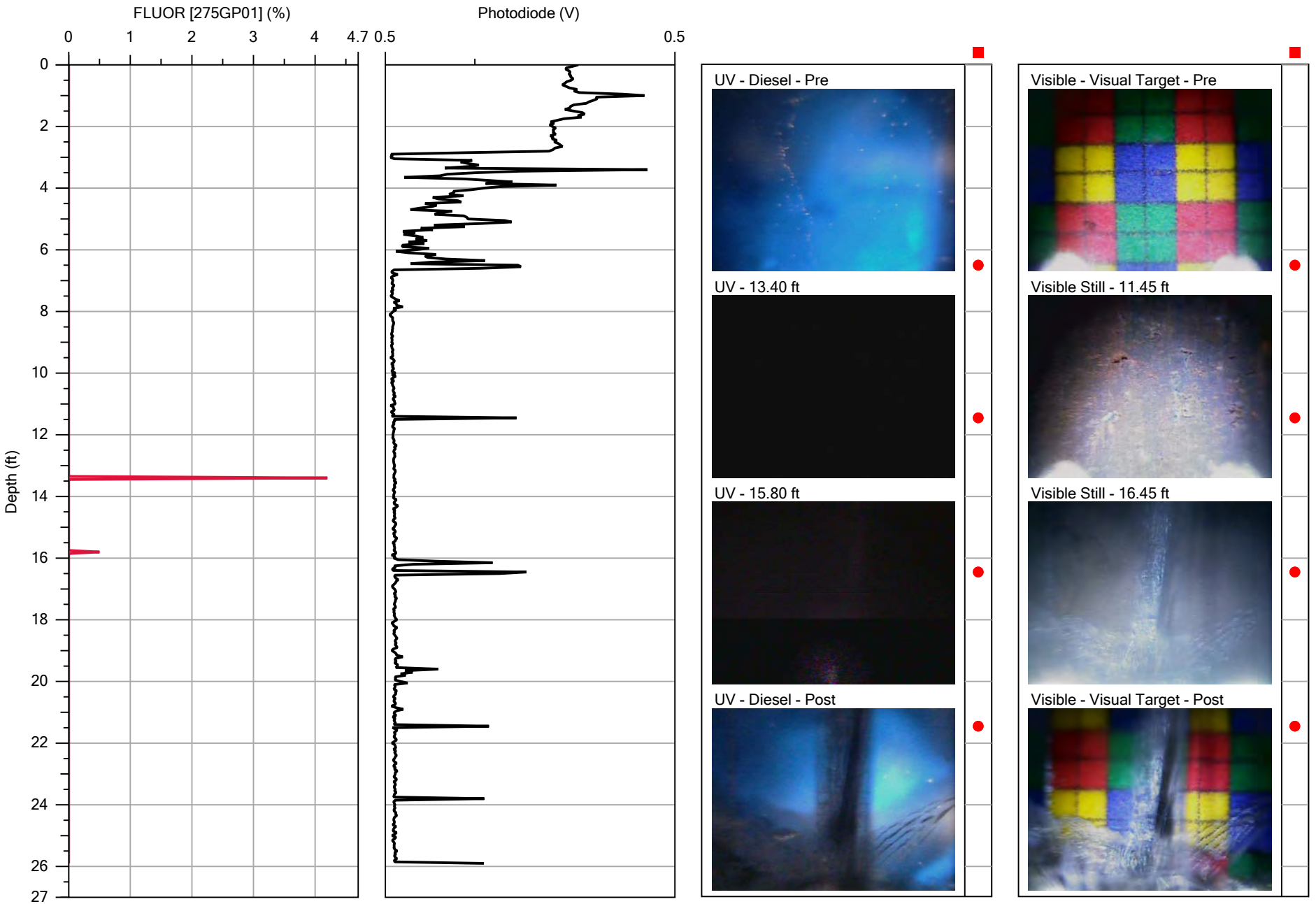
Direct Image® By Geoprobe Systems®

		File: CD-01.OIHP
Company: Parratt-Wolff, Inc.	Operator: CJ	Date: 12/16/2021
Project ID: 21701	Client: Stantec	Location: PES



Direct Image® By Geoprobe Systems®

		File: CD-02A.OIHP
Company: Parratt-Wolff, Inc.	Operator: CJ	Date: 12/8/2021
Project ID: 21701	Client: Stantec	Location: PES



Direct Image® By Geoprobe Systems®

		File: CD-02A-UVR-1.OIHP
Company: Parratt-Wolff	Operator: Cliff Hannan	Date: 1/14/2022
Project ID: 21701	Client: Stantec	Location: PES

CD-02A-UVR-1.zip

SITE INFORMATION -- DIRECT IMAGE OIP+HPT PROBE

Geoprobe DI Acquisition Software for Windows
Version: 3.4   Build: 22011

Pre-Log EC Load Tests

Test	Target (mS/m)	Actual (mS/m)	% Diff	P/F
Low	55.0	59.3	7.9	PASS
High	360.0	356.3	1.0	PASS

COMPANY: Parratt-Wolff
OPERATOR: Cliff Hannan
PROJECT ID: 21701
CLIENT: Stantec
UNITS: ENGLISH
PROBE AND ARRAY: OIHPT-UVR UV275 with Top Dipole
LOCATION: PES
100 INCH STRING POT USED
ROD LENGTH: 5 feet

FILTER SETTINGS
Filter 0:
FILTER NAME: 275GPFilterEF001
FILTER GUID: 539c6c5b-435b-4181-b36d-01535f2f7a4f
T1: H[85-220] S[140-255] V[90-255]
T2: H[85-220] S[0-139] V[150-255]

Filter 1:
FILTER NAME: 275CFCrudeEH001
FILTER GUID: 246cb286-d63d-4bf9-a256-bcd2d80919ca
T1: H[0-145] S[0-127] V[90-255]
T2: H[0-0] S[0-0] V[0-0]

LOGGING MODE: 275

OIP PRE-LOG TEST

Visual Target	Visible	22.4
Black Box	UV	0.1
Diesel UV		81.2
Motor Oil	UV	80.9

Frame grabber settings:
Brightness: 111
Contrast: 140
Hue: 0
Saturation: 200

PRE-LOG HPT REFERENCE TEST VALUES

PRE TEST TIME: Fri Jan 14 2022 11:09:19

TEST	HPT PRESSURE (psi)	FLOW (mL/min)	HPT PRESSURE (kPa)
TOP with FLOW=0	16.036	0.0	110.570
TOP with FLOW>0	16.146	230.9	111.320
BOTTOM with FLOW=0	15.947	0.0	109.950
BOTTOM with FLOW>0	16.068	235.6	110.780

EXPECTED FLOW=0 HPT DIFF.: 0.22 psi (1.5 kPa) +/- 10%
ACTUAL FLOW=0 HPT DIFF.: 0.09 psi (0.6 kPa)

TRANSDUCER TEST FAILED

HPT IDEAL COEFFS: 2.2696e1,-2.2356
HPT SENSOR CAL NUMBERS: DEFAULT, 0.000, 0.000, 0.000, 0.000, 2.587, -25.86
LOG START TIME: Fri Jan 14 2022 11:11:43

LOG END DEPTH: 25.90 ft (7.894 m)
LOG END TIME: Fri Jan 14 2022 11:29:41

LATITUDE: 0.000000000
LONGITUDE: 0.000000000
ELEVATION: 0.000 METERS 0.00 FEET
GPS Quality: None

OIP PRE/POST-LOG TEST RESULTS

Name	Light	Pre	Post	Dif
Visual Target	Visible	22.4	27.8	5.3
Black Box	UV	0.1	0.0	0.1
Diesel	UV	81.2	54.0	27.2
Motor Oil	UV	80.9	52.2	28.6

Frame grabber settings:
Brightness: 111
Contrast: 140
Hue: 0
Saturation: 200

POST-LOG HPT REFERENCE TEST VALUES

POST TEST TIME: Fri Jan 14 2022 11:43:38

TEST	HPT PRESSURE (psi)	FLOW (mL/min)	HPT PRESSURE (kPa)
TOP with FLOW=0	16.031	0.0	110.530
TOP with FLOW>0	16.130	232.2	111.210
BOTTOM with FLOW=0	15.947	0.0	109.950
BOTTOM with FLOW>0	16.062	236.3	110.750

EXPECTED FLOW=0 HPT DIFF.: 0.22 psi (1.5 kPa) +/- 10%
ACTUAL FLOW=0 HPT DIFF.: 0.08 psi (0.6 kPa)

TRANSDUCER TEST FAILED

Post-Log EC Load Tests

Test	Target (mS/m)	Actual (mS/m)	% Diff	P/F
Low	55.0	56.0	1.7	PASS
High	360.0	295.3	18.0	FAIL

Post-Log EC Troubleshooting Tests

Test	Value	P/F
Instrument Calibration Tests		
10 Ohms:	10.4 Ohms	PASS
100 Ohms:	100.3 Ohms	PASS
1000 Ohms:	1008.3 Ohms	PASS

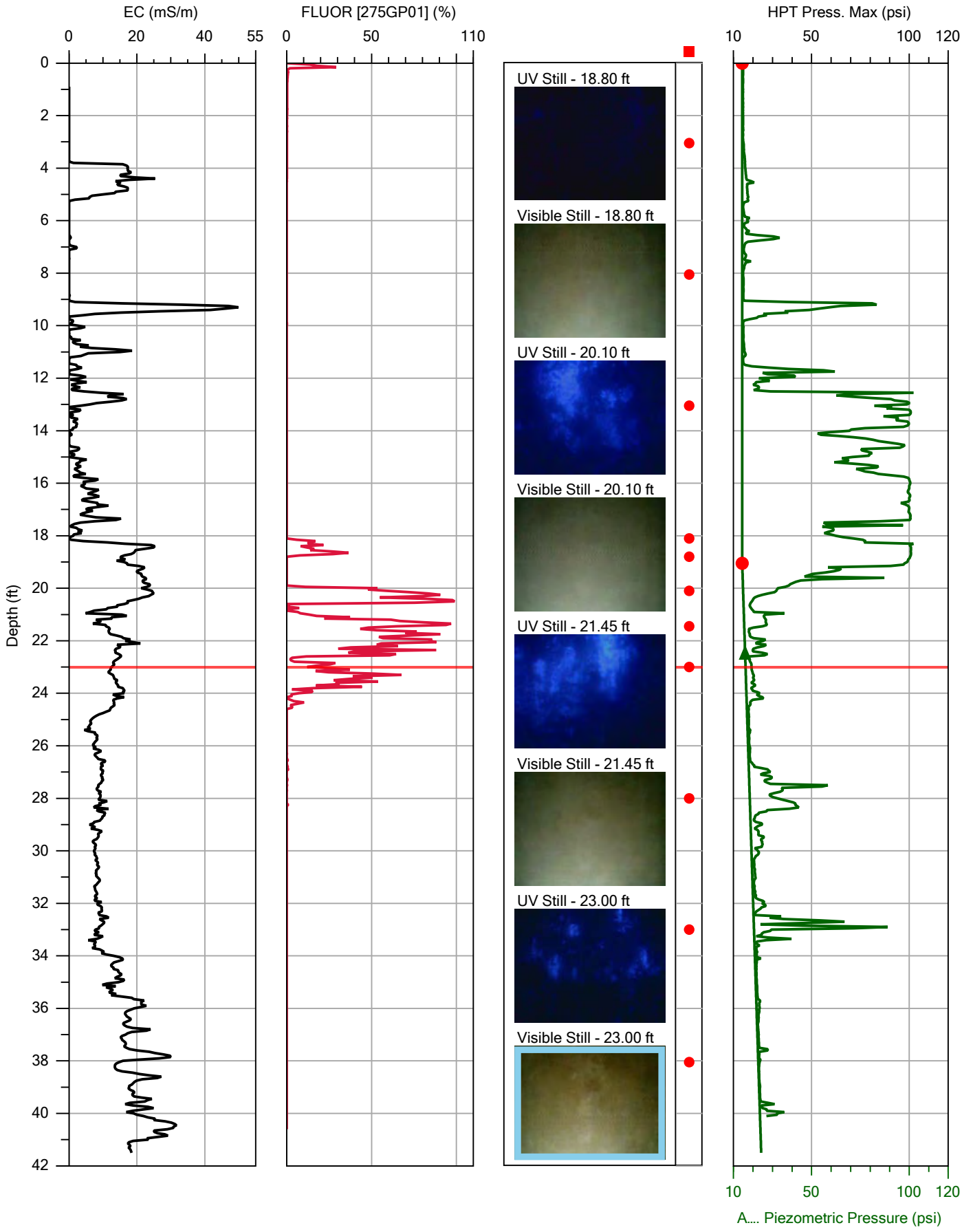
WARNING: ONE OR MORE EC TESTS FAILED, SO EC DATA FOR THIS LOG MAY BE UNRELIABLE

********** USER NOTES **********

OIP Window cracked in log. Post log OIP QA/QC run with cracked window.

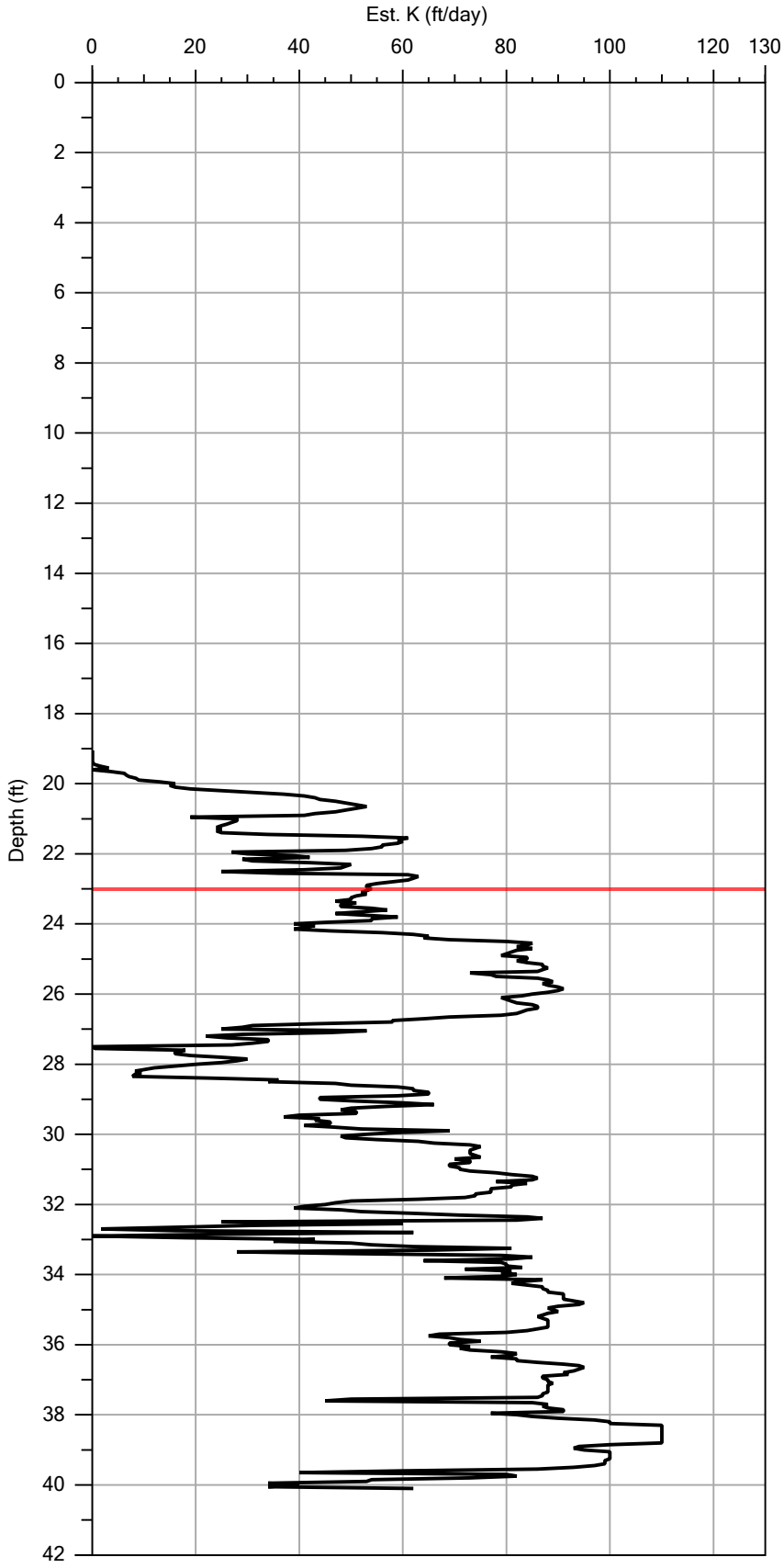
Pre Log Photodiode (V):
Black Box: .55394
Diesel:1.90064
Motor Oil: 2.36275

Post Log Photodiode (V):
Black Box: .51875
Diesel: .79074
Motor Oil: 1.06856



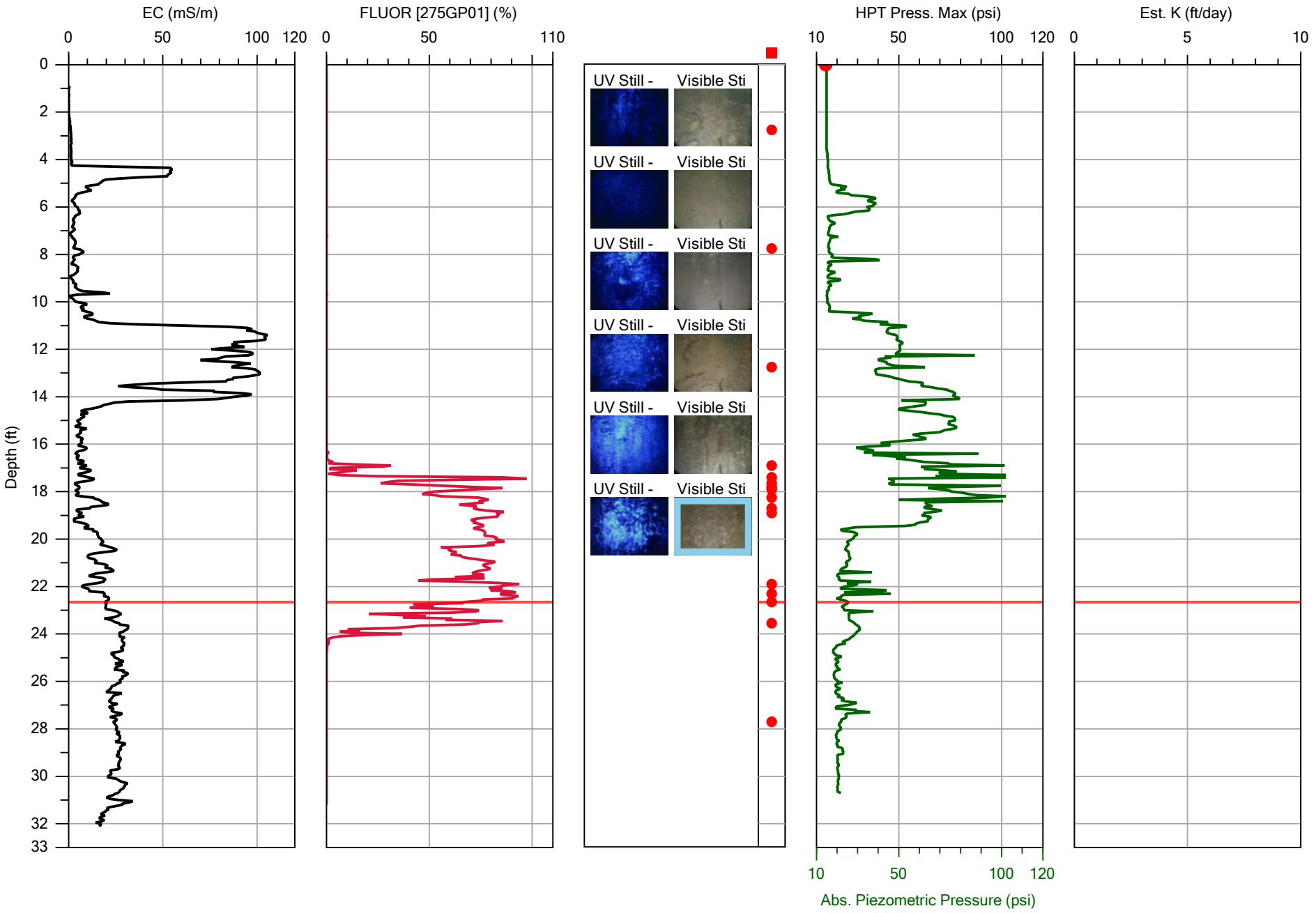
Direct Image® By Geoprobe Systems®

		File: CD-2B.OIHP
Company: Parratt-Wolff, Inc.	Operator: CJ	Date: 12/7/2021
Project ID: 21701	Client: Stantec	Location: PES



Direct Image® By Geoprobe Systems®

			File: CD-2B.OIHP
Company: Parratt-Wolff, Inc.		Operator: CJ	Date: 12/7/2021
Project ID: 21701		Client: Stantec	Location: PES



Direct Image® By Geoprobe Systems®

		File: CD-03 OFFSET.OIHP
Company: Parratt-Wolff, Inc.	Operator: CJ	Date: 12/16/2021
Project ID: 21701	Client: Stantec	Location: PES

CD-03 offset.zip

SITE INFORMATION -- DIRECT IMAGE OIP+HPT PROBE

Geoprobe DI Acquisition Software for Windows
Version: 3.3 Build: 19087

Pre-Log EC Load Tests

Test	Target (mS/m)	Actual (mS/m)	% Diff	P/F
Low	55.0	57.6	4.6	PASS
High	360.0	339.3	5.7	PASS

COMPANY: Parratt-Wolff, Inc.
OPERATOR: CJ
PROJECT ID: 21701
CLIENT: Stantec
UNITS: ENGLISH
PROBE AND ARRAY: OH6570 OIHPT UV275 VIS with Top Dipole
PROBE SERIAL NUMBER: OIP-2
LOCATION: PES
100 INCH STRING POT USED
ROD LENGTH: 5 feet

FILTER SETTINGS
Filter:
FILTER NAME: 275GPFilterEF001
FILTER GUID: 539c6c5b-435b-4181-b36d-01535f2f7a4f
T1: H[85-220] S[140-255] V[90-255]
T2: H[85-220] S[0-139] V[150-255]

LOGGING MODE: 275

OIP PRE-LOG TEST

Visual Target	Visible	12.2
Black Box	UV	0.0
Diesel UV		92.7
Motor Oil	UV	94.2

Frame grabber settings:
Brightness: 111
Contrast: 140
Hue: 0

Saturation: 200

PRE-LOG HPT REFERENCE TEST VALUES

PRE TEST TIME: Thu Dec 16 2021 10:23:39

TEST	HPT PRESSURE (psi)	FLOW (mL/min)	HPT PRESSURE (kPa)
TOP with FLOW=0	14.795	0.0	102.010
TOP with FLOW>0	15.250	268.7	105.140
BOTTOM with FLOW=0	14.569	0.0	100.450
BOTTOM with FLOW>0	15.031	270.2	103.640

EXPECTED FLOW=0 HPT DIFF.: 0.22 psi (1.5 kPa) +/- 10%
ACTUAL FLOW=0 HPT DIFF.: 0.23 psi (1.6 kPa)

TRANSDUCER TEST PASSED

HPT IDEAL COEFFS: 2.2696e1,-2.2356
HPT SENSOR CAL NUMBERS: F248OH,0.0000,0.0000,0.0000,0.0000,2.5440,-2.5760e1
LOG START TIME: Thu Dec 16 2021 10:32:33

LOG END DEPTH: 31.20 ft (9.510 m)
LOG END TIME: Thu Dec 16 2021 11:00:25

LATITUDE: 0.000000000
LONGITUDE: 0.000000000
ELEVATION: 0.000 METERS 0.00 FEET
GPS Quality: None

OIP PRE/POST-LOG TEST RESULTS

Name	Light	Pre	Post	Dif
Visual Target	Visible	12.2	8.3	3.9
Black Box	UV	0.0	0.0	0.0
Diesel	UV	92.7	90.2	2.5
Motor Oil	UV	94.2	86.8	7.5

Frame grabber settings:
Brightness: 111
Contrast: 140
Hue: 0
Saturation: 200

POST-LOG HPT REFERENCE TEST VALUES

POST TEST TIME: Thu Dec 16 2021 11:24:14

TEST	HPT PRESSURE (psi)	FLOW (mL/min)	HPT PRESSURE (kPa)
TOP with FLOW=0	14.757	0.0	101.750
TOP with FLOW>0	15.208	272.6	104.850
BOTTOM with FLOW=0	14.546	0.0	100.290
BOTTOM with FLOW>0	14.984	272.5	103.310

EXPECTED FLOW=0 HPT DIFF.: 0.22 psi (1.5 kPa) +/- 10%
ACTUAL FLOW=0 HPT DIFF.: 0.21 psi (1.5 kPa)

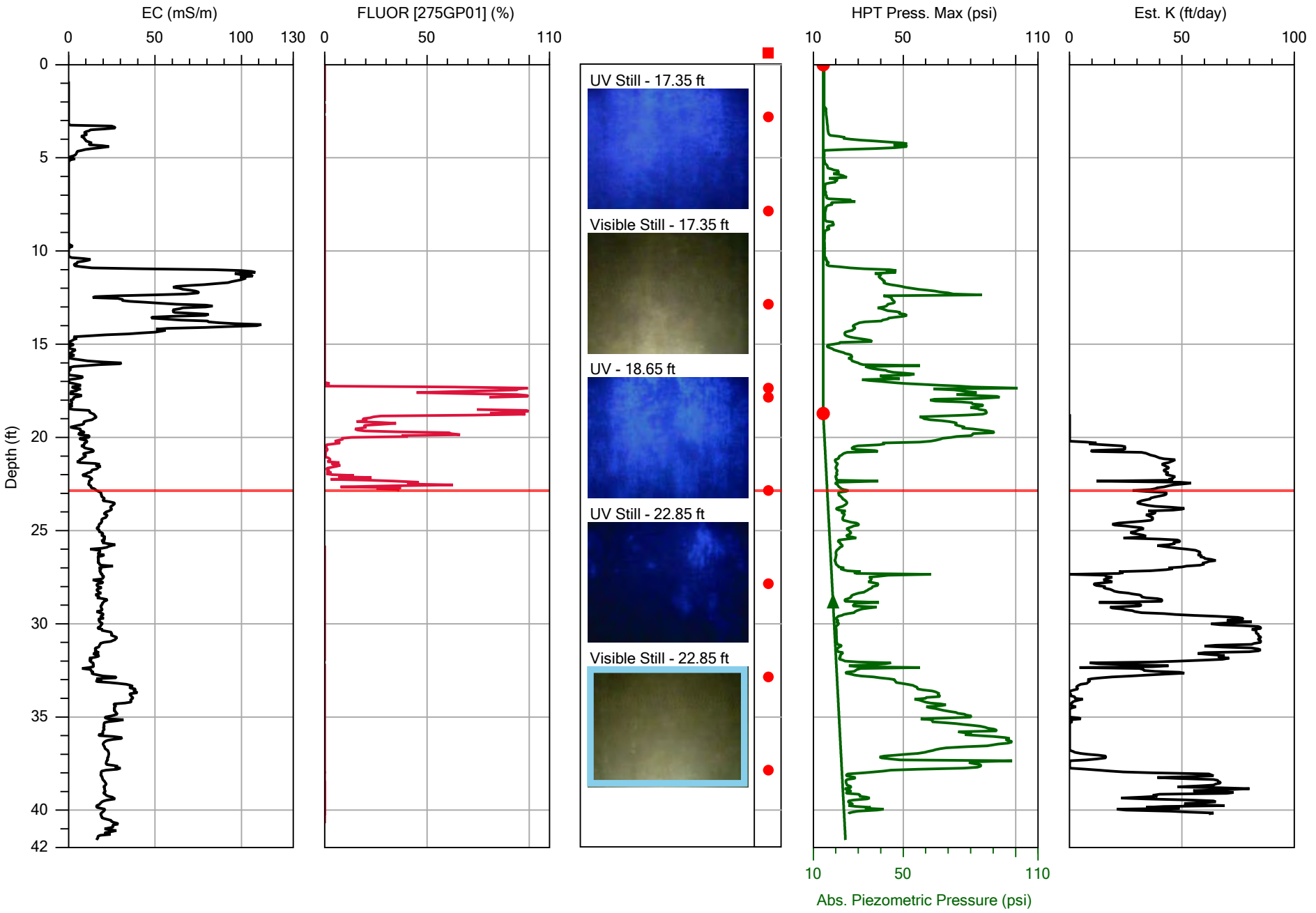
TRANSDUCER TEST PASSED

Post-Log EC Load Tests

Test	Target (mS/m)	Actual (mS/m)	% Diff	P/F
Low	55.0	60.1	9.2	PASS
High	360.0	351.1	2.5	PASS

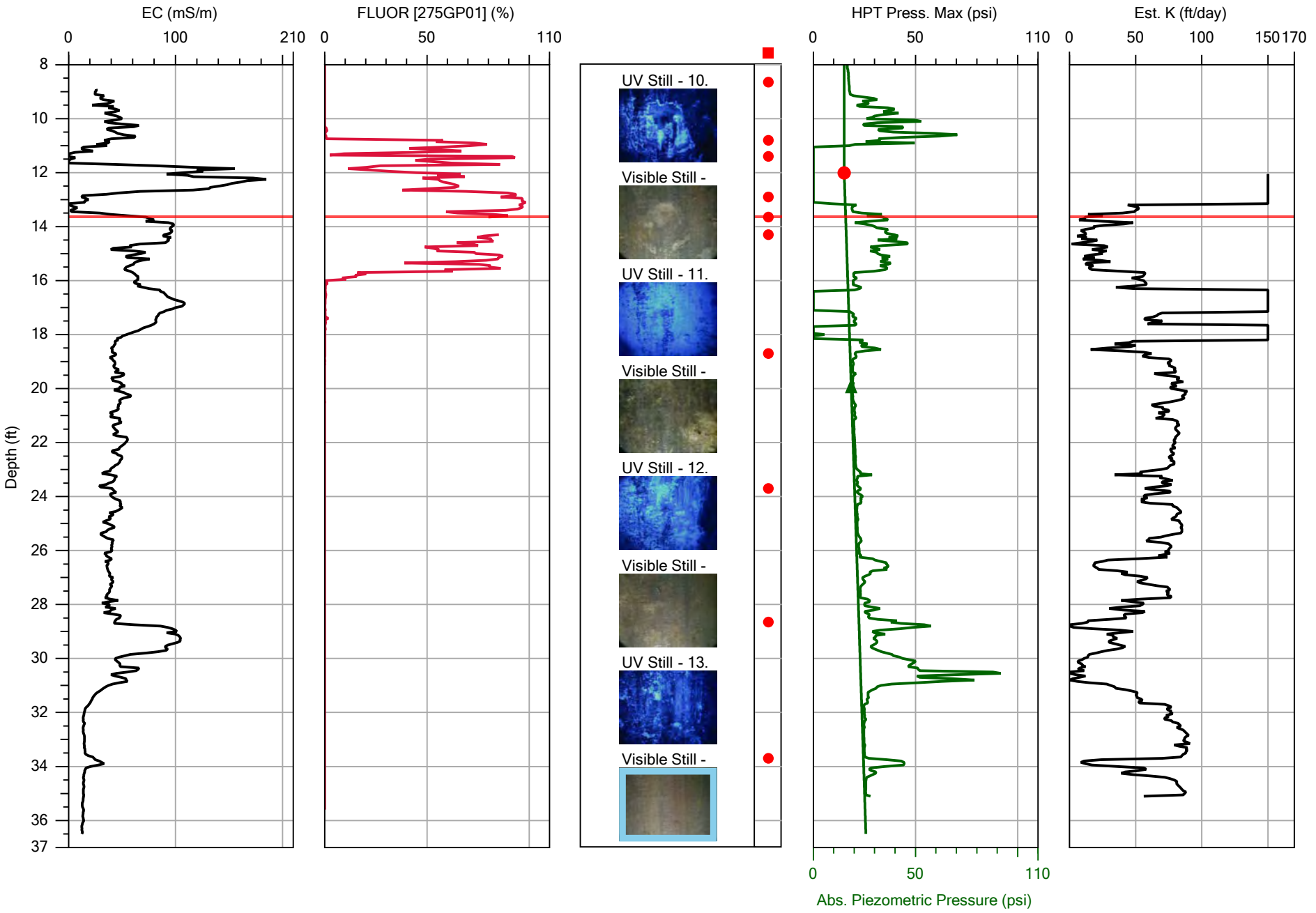
********** USER NOTES **********

Preprobe to 5ft



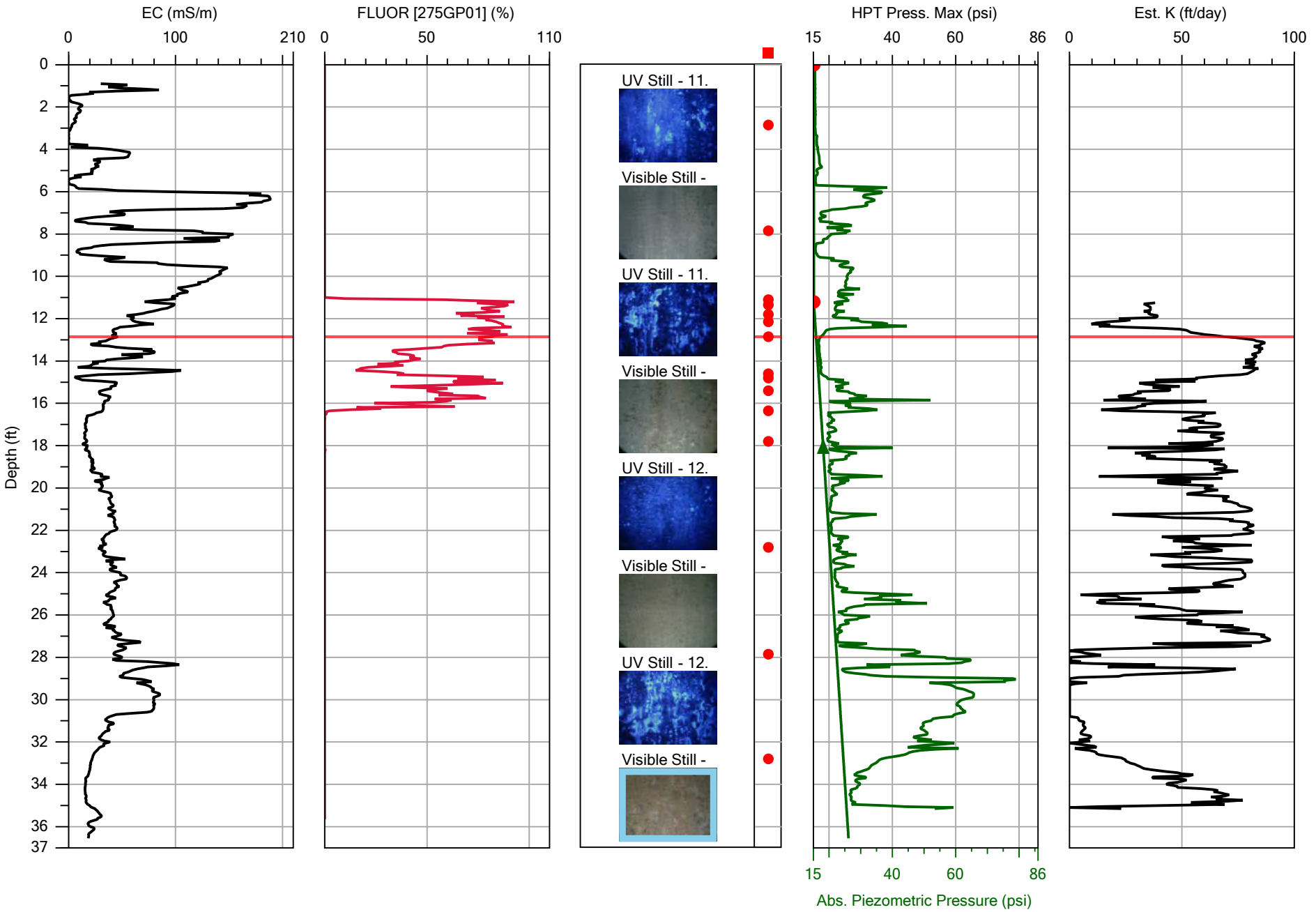
Direct Image® By Geoprobe Systems®

		File: CD-03.OIHP
Company: Parratt-Wolff, Inc.	Operator: CJ	Date: 12/8/2021
Project ID: 21701	Client: Stantec	Location: PES



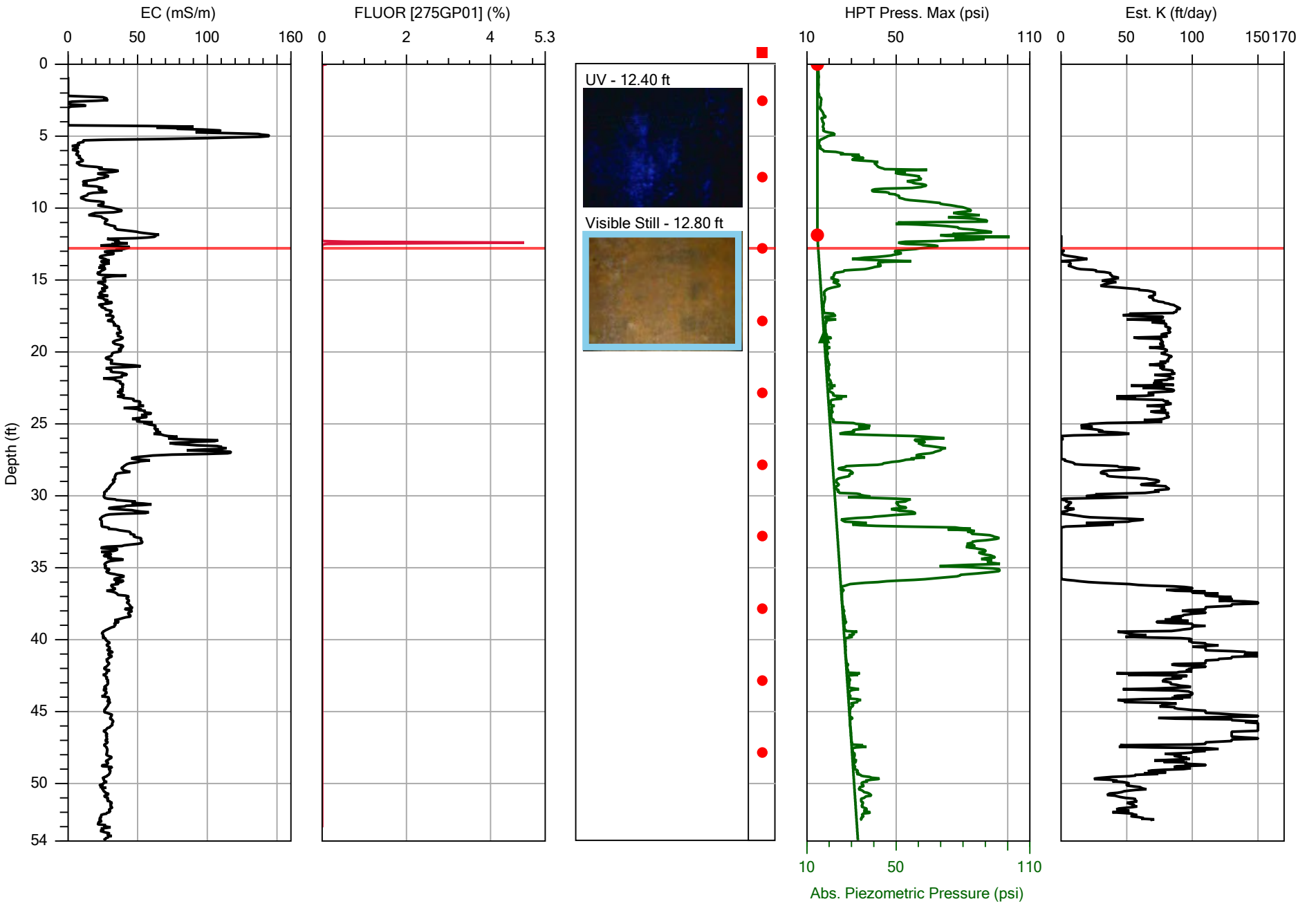
Direct Image® By Geoprobe Systems®

		File: CD-05A.OIHP
Company: Parratt-Wolff, Inc.	Operator: CJ	Date: 12/10/2021
Project ID: 21701	Client: Stantec	Location: PES



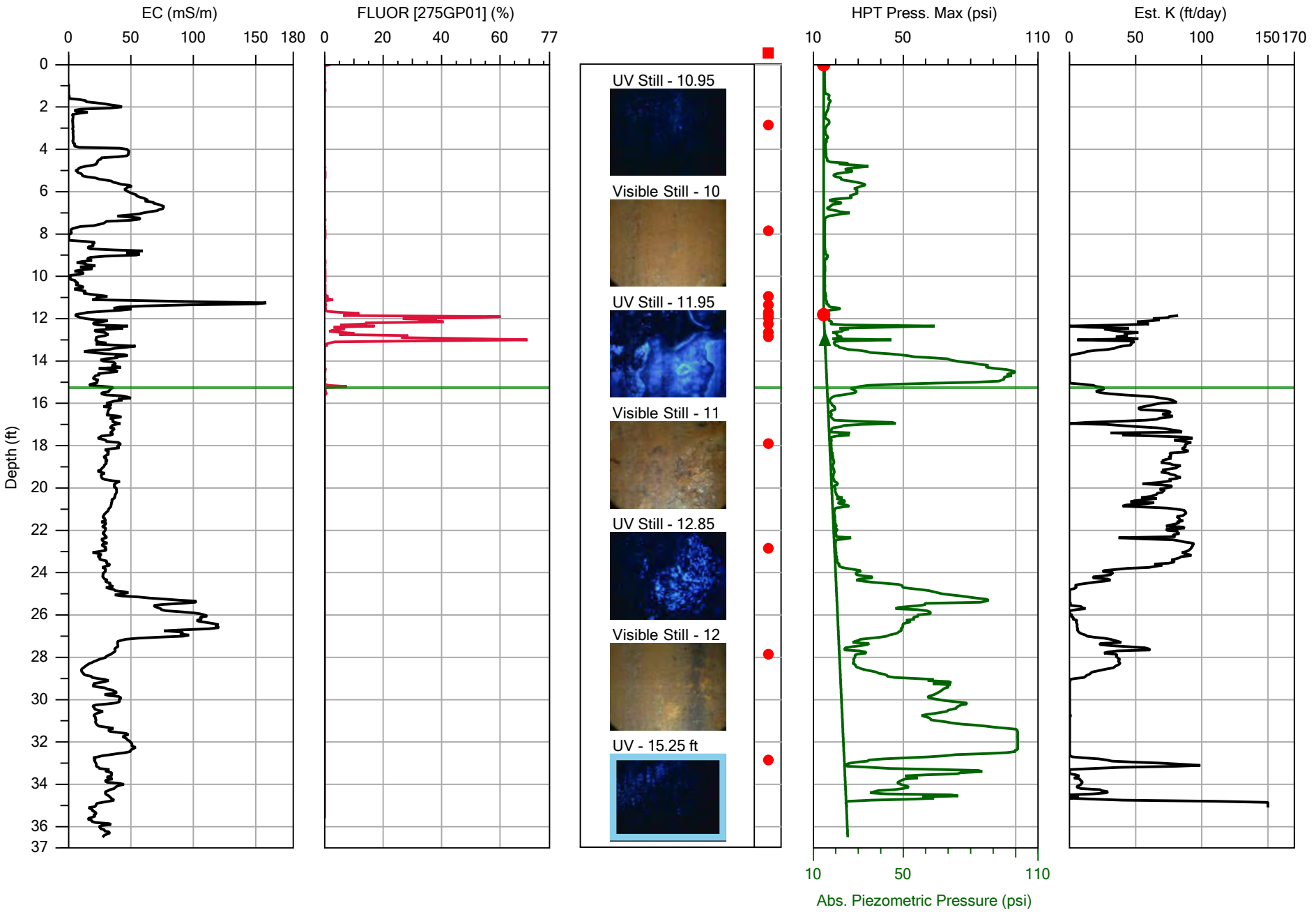
Direct Image® By Geoprobe Systems®

		File: CD-05B.OIHP
Company: Parratt-Wolff, Inc.	Operator: CJ	Date: 12/10/2021
Project ID: 21701	Client: Stantec	Location: PES

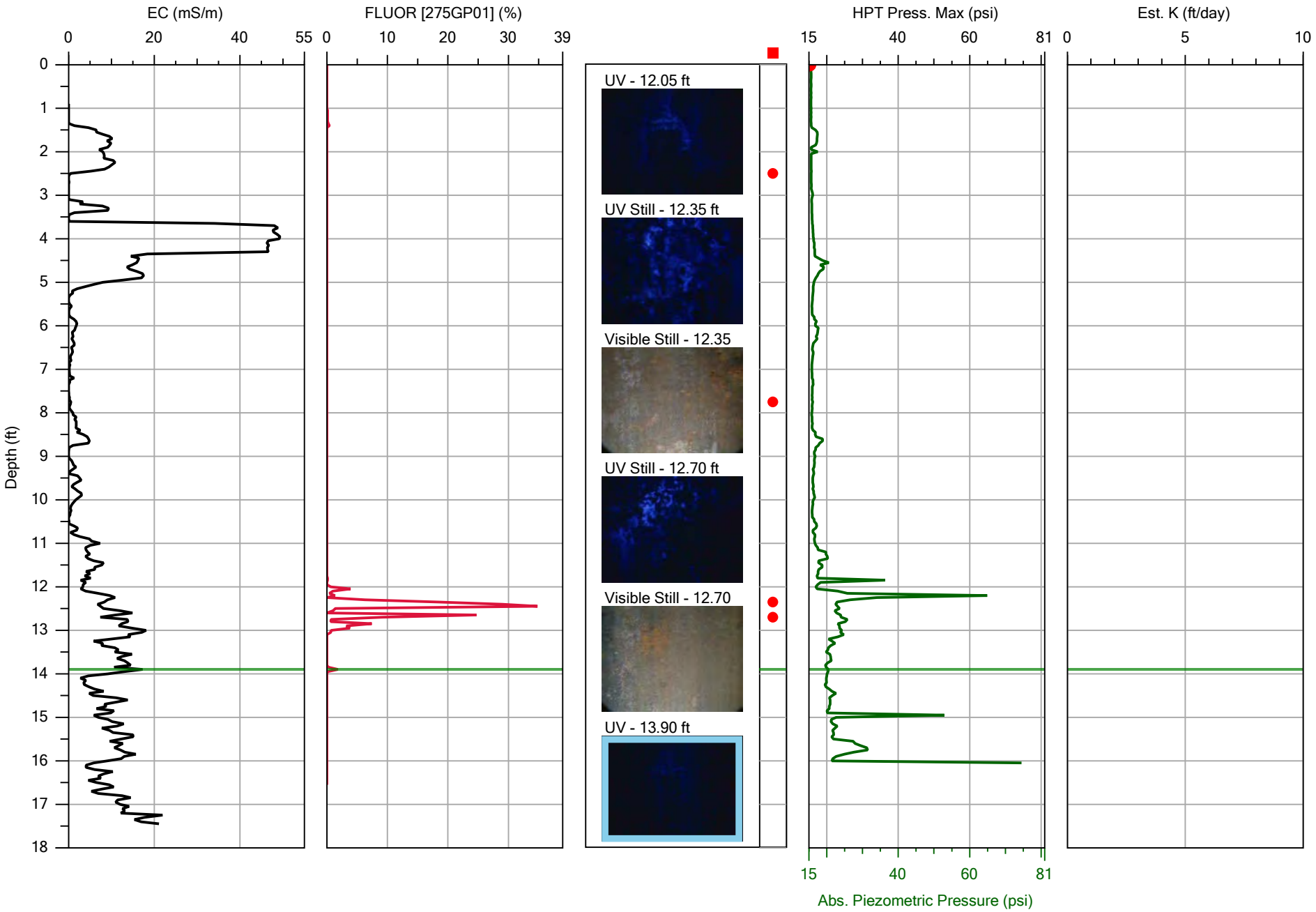


Direct Image® By Geoprobe Systems®

		File: CD-06.OIHP
Company: Parratt-Wolff, Inc.	Operator: CJ	Date: 12/14/2021
Project ID: 21701	Client: Stantec	Location: PES

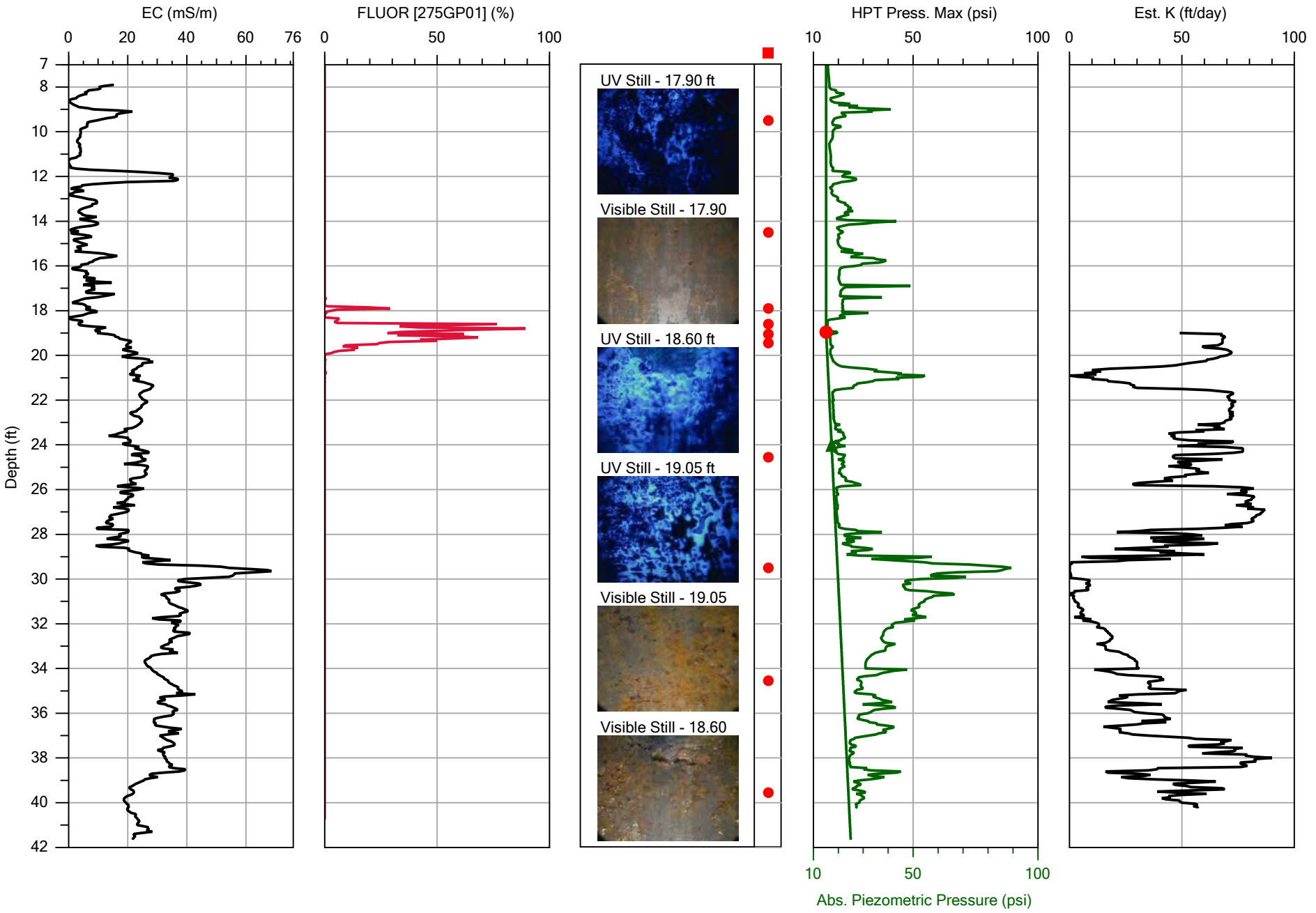


			File: CD-07A.OIHP
Company: Parratt-Wolff, Inc.		Operator: CJ	Date: 12/14/2021
Project ID: 21701		Client: Stantec	Location: PES



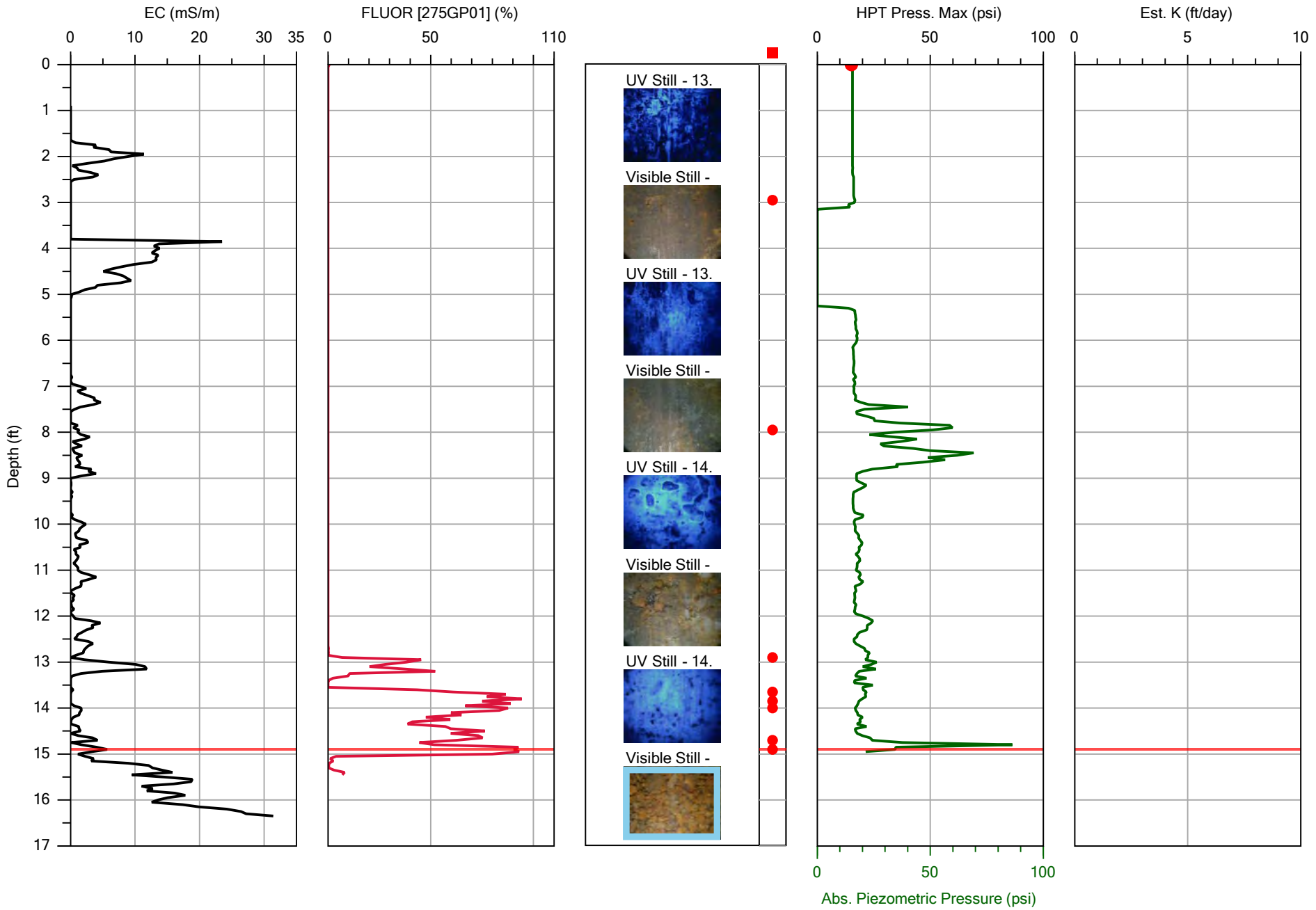
Direct Image® By Geoprobe Systems®

		File: CD-07B.OIHP
Company: Parratt-Wolff, Inc.	Operator: CJ	Date: 12/13/2021
Project ID: 21701	Client: Stantec	Location: PES



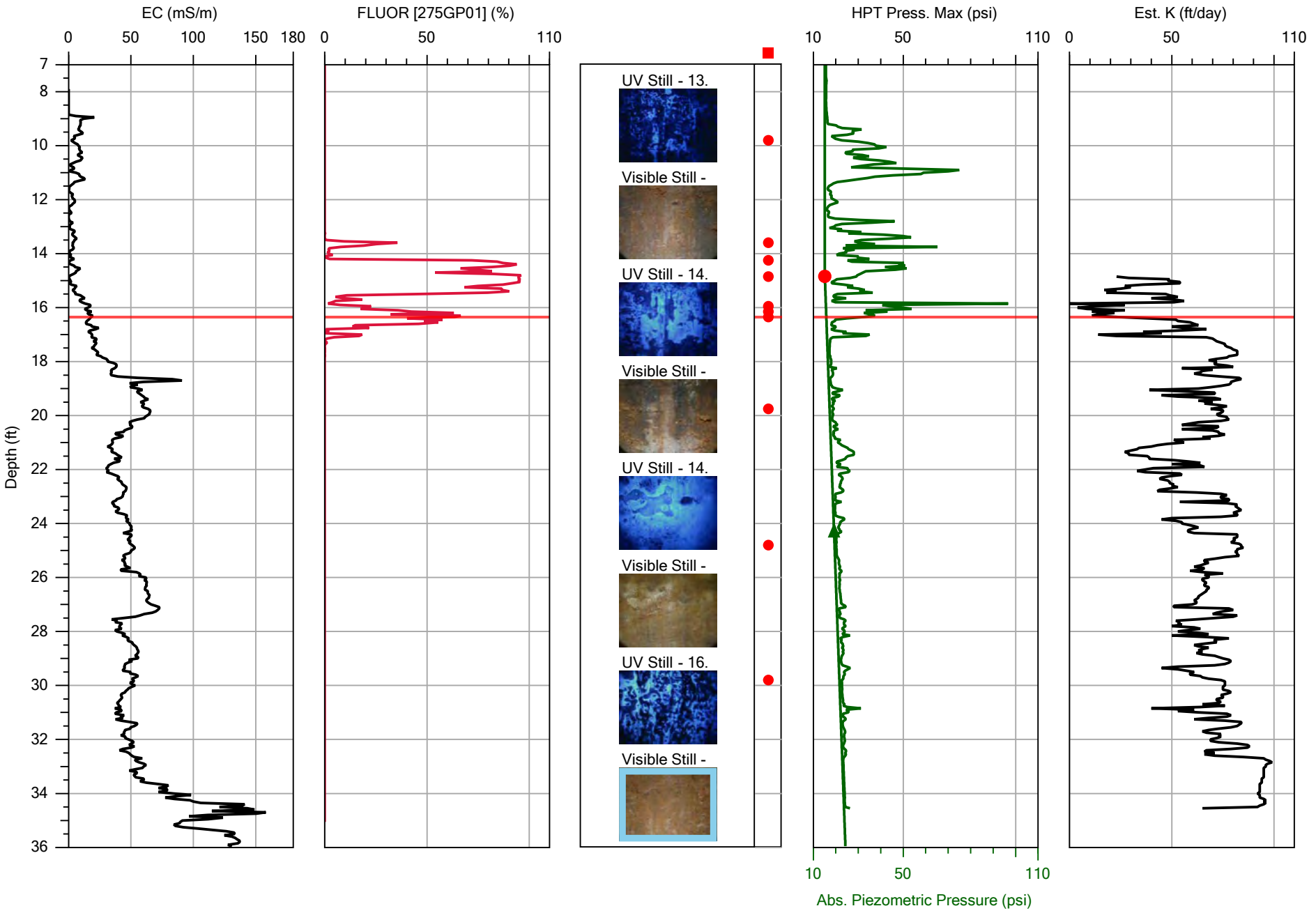
Direct Image® By Geoprobe Systems®

		File: CD-08A.OIHP
Company: Parratt-Wolff, Inc.	Operator: CJ	Date: 12/9/2021
Project ID: 21701	Client: Stantec	Location: PES



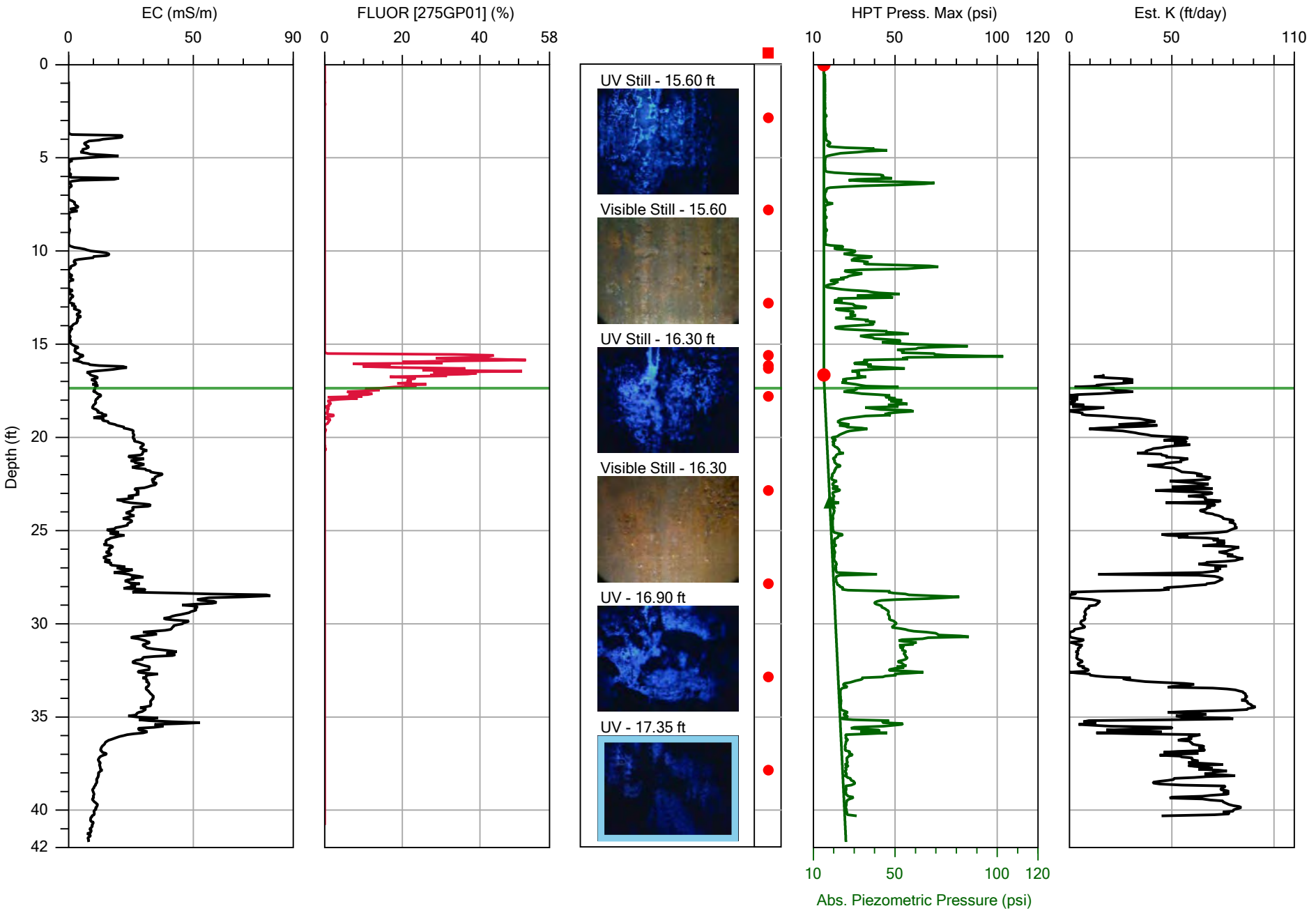
Direct Image® By Geoprobe Systems®

		File: CD-08B.OIHP
Company: Parratt-Wolff, Inc.	Operator: CJ	Date: 12/9/2021
Project ID: 21701	Client: Stantec	Location: PES

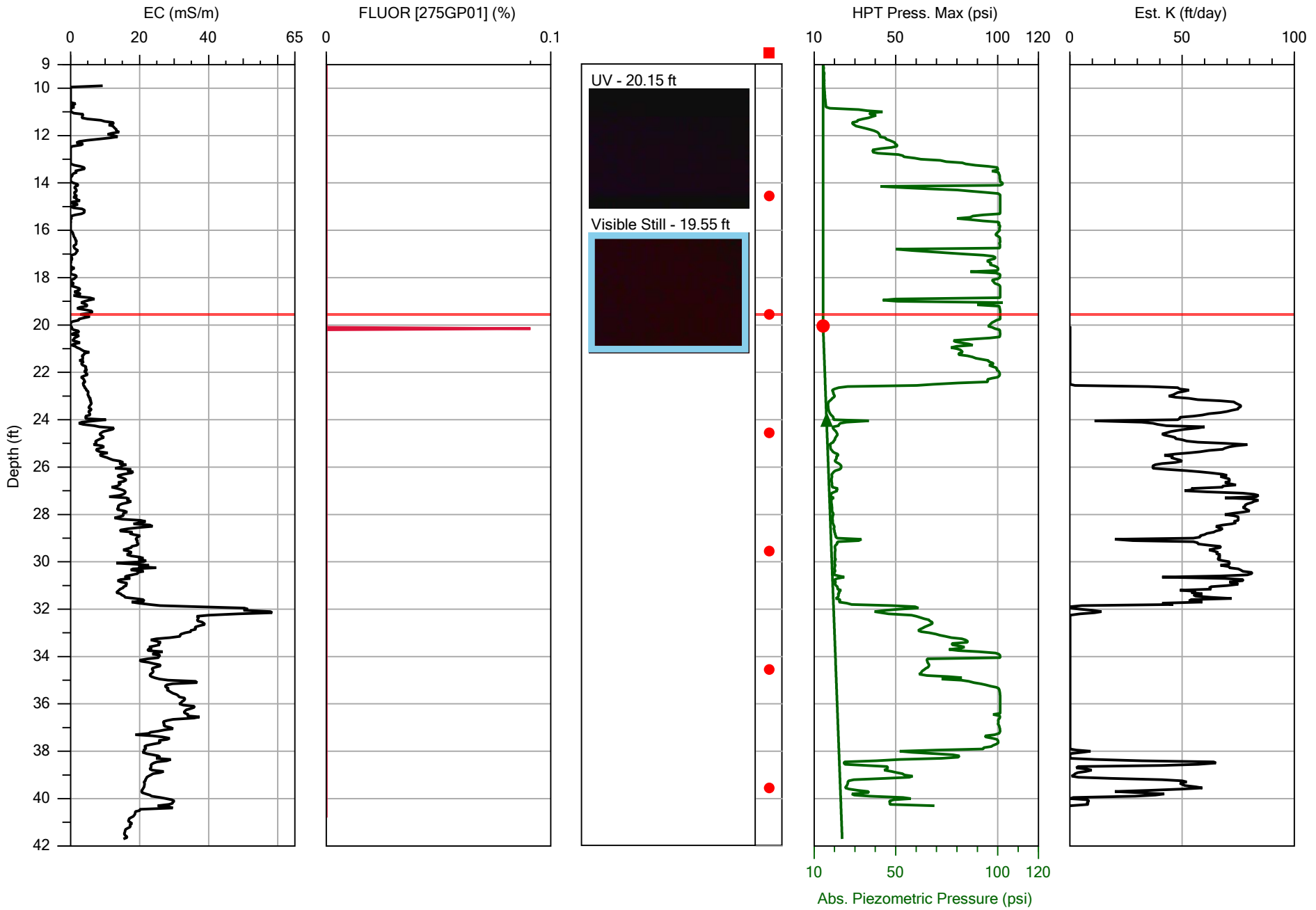


Direct Image® By Geoprobe Systems®

			File: CD-08C.OIHP
Company: Parratt-Wolff, Inc.		Operator: CJ	Date: 12/9/2021
Project ID: 21701		Client: Stantec	Location: PES

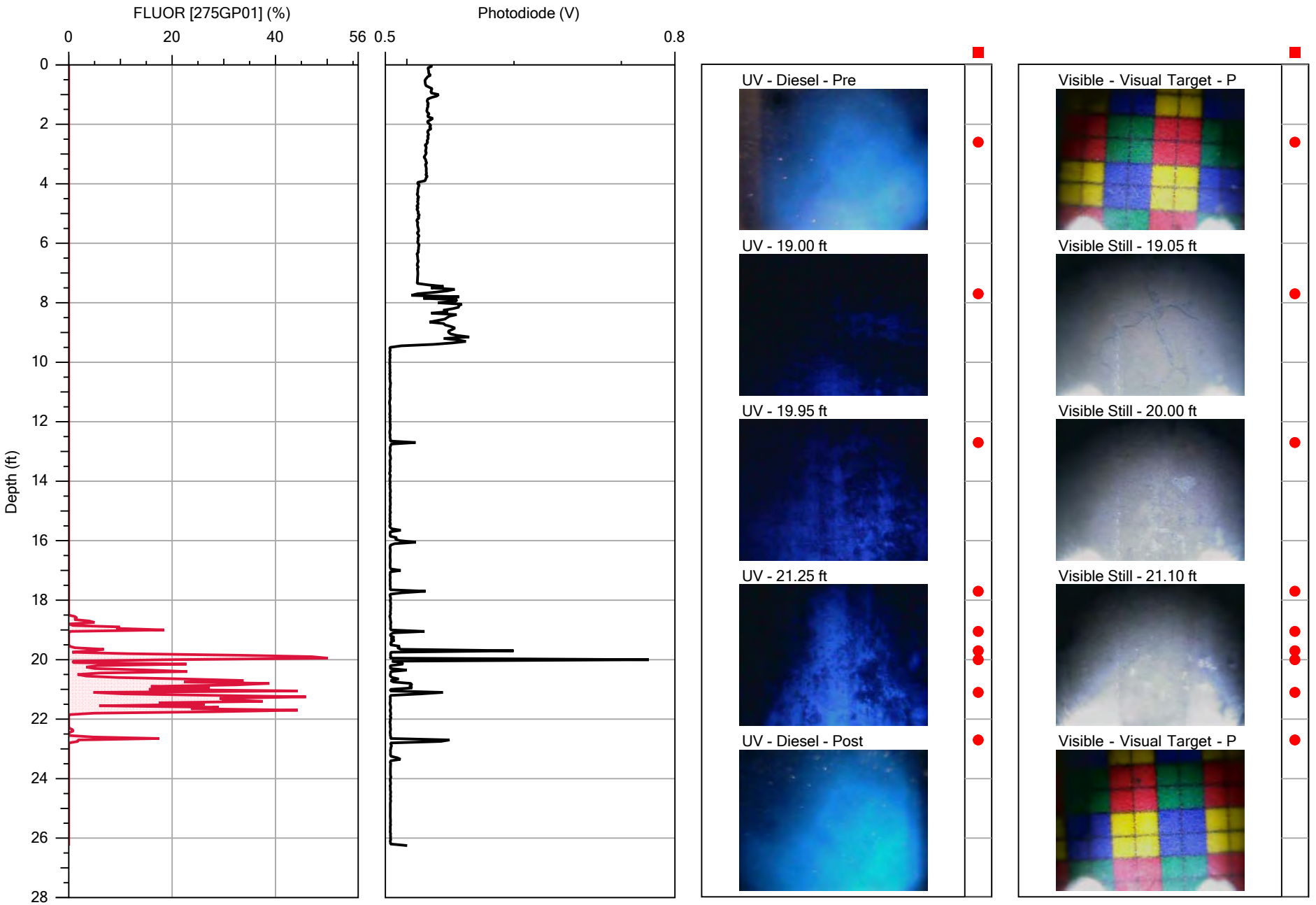


			File: CD-08D.OIHP
Company: Parratt-Wolff, Inc.	Operator: CJ		Date: 12/9/2021
Project ID: 21701	Client: Stantec		Location: PES



Direct Image® By Geoprobe Systems®

		File: CD-09A.OIHP
Company: Parratt-Wolff, Inc.	Operator: CJ	Date: 12/8/2021
Project ID: 21701	Client: Stantec	Location: PES



Direct Image® By Geoprobe Systems®

		File: CD-09A-UVR-1.OIHP
Company: Parratt-Wolff	Operator: Cliff Hannan	Date: 1/14/2022
Project ID: 21701	Client: Stantec	Location: PES

CD-09A-UVR-1.zip

SITE INFORMATION -- DIRECT IMAGE OIP+HPT PROBE

Geoprobe DI Acquisition Software for Windows
Version: 3.4   Build: 22011

Pre-Log EC Load Tests

Test	Target (mS/m)	Actual (mS/m)	% Diff	P/F
Low	55.0	55.2	0.3	PASS
High	360.0	332.4	7.7	PASS

COMPANY: Parratt-Wolff
OPERATOR: Cliff Hannan
PROJECT ID: 21701
CLIENT: Stantec
UNITS: ENGLISH
PROBE AND ARRAY: OIHPT-UVR UV275 with Top Dipole
LOCATION: PES
100 INCH STRING POT USED
ROD LENGTH: 5 feet

FILTER SETTINGS
Filter 0:
FILTER NAME: 275GPFilterEF001
FILTER GUID: 539c6c5b-435b-4181-b36d-01535f2f7a4f
T1: H[85-220] S[140-255] V[90-255]
T2: H[85-220] S[0-139] V[150-255]

Filter 1:
FILTER NAME: 275CFCrudeEH001
FILTER GUID: 246cb286-d63d-4bf9-a256-bcd2d80919ca
T1: H[0-145] S[0-127] V[90-255]
T2: H[0-0] S[0-0] V[0-0]

LOGGING MODE: 275

OIP PRE-LOG TEST

Visual Target	Visible	25.7
Black Box	UV	0.1
Diesel	UV	78.3
Motor Oil	UV	85.7

Frame grabber settings:
Brightness: 111
Contrast: 140
Hue: 0
Saturation: 200

PRE-LOG HPT REFERENCE TEST VALUES

PRE TEST TIME: Fri Jan 14 2022 09:47:06

TEST	HPT PRESSURE (psi)	FLOW (mL/min)	HPT PRESSURE (kPa)
TOP with FLOW=0	16.170	0.0	111.490
TOP with FLOW>0	16.175	251.7	111.520
BOTTOM with FLOW=0	15.948	0.0	109.960
BOTTOM with FLOW>0	16.089	250.0	110.930

EXPECTED FLOW=0 HPT DIFF.: 0.22 psi (1.5 kPa) +/- 10%
ACTUAL FLOW=0 HPT DIFF.: 0.22 psi (1.5 kPa)

TRANSDUCER TEST PASSED

HPT IDEAL COEFFS: 2.2696e1,-2.2356
HPT SENSOR CAL NUMBERS: DEFAULT, 0.000, 0.000, 0.000, 0.000, 2.587, -25.86
Probe advancement with HPT flow valve and/or pump switch turned off at 0.05 ft (0.015 m).
LOG START TIME: Fri Jan 14 2022 10:00:48

LOG END DEPTH: 26.25 ft (8.001 m)
LOG END TIME: Fri Jan 14 2022 10:18:20

LATITUDE: 0.000000000
LONGITUDE: 0.000000000
ELEVATION: 0.000 METERS 0.00 FEET
GPS Quality: None

OIP PRE/POST-LOG TEST RESULTS

Name	Light	Pre	Post	Dif
Visual Target	Visible	25.7	24.6	1.1
Black Box	UV	0.1	0.0	0.0
Diesel	UV	78.3	84.1	5.8
Motor Oil	UV	85.7	92.9	7.2

Frame grabber settings:
Brightness: 111
Contrast: 140
Hue: 0
Saturation: 200

POST-LOG HPT REFERENCE TEST VALUES

POST TEST TIME: Fri Jan 14 2022 10:47:20

TEST	HPT PRESSURE (psi)	FLOW (mL/min)	HPT PRESSURE (kPa)
TOP with FLOW=0	16.040	0.0	110.590
TOP with FLOW>0	16.162	232.1	111.430
BOTTOM with FLOW=0	15.949	0.0	109.970
BOTTOM with FLOW>0	16.069	239.2	110.790

EXPECTED FLOW=0 HPT DIFF.: 0.22 psi (1.5 kPa) +/- 10%
ACTUAL FLOW=0 HPT DIFF.: 0.09 psi (0.6 kPa)

TRANSDUCER TEST FAILED

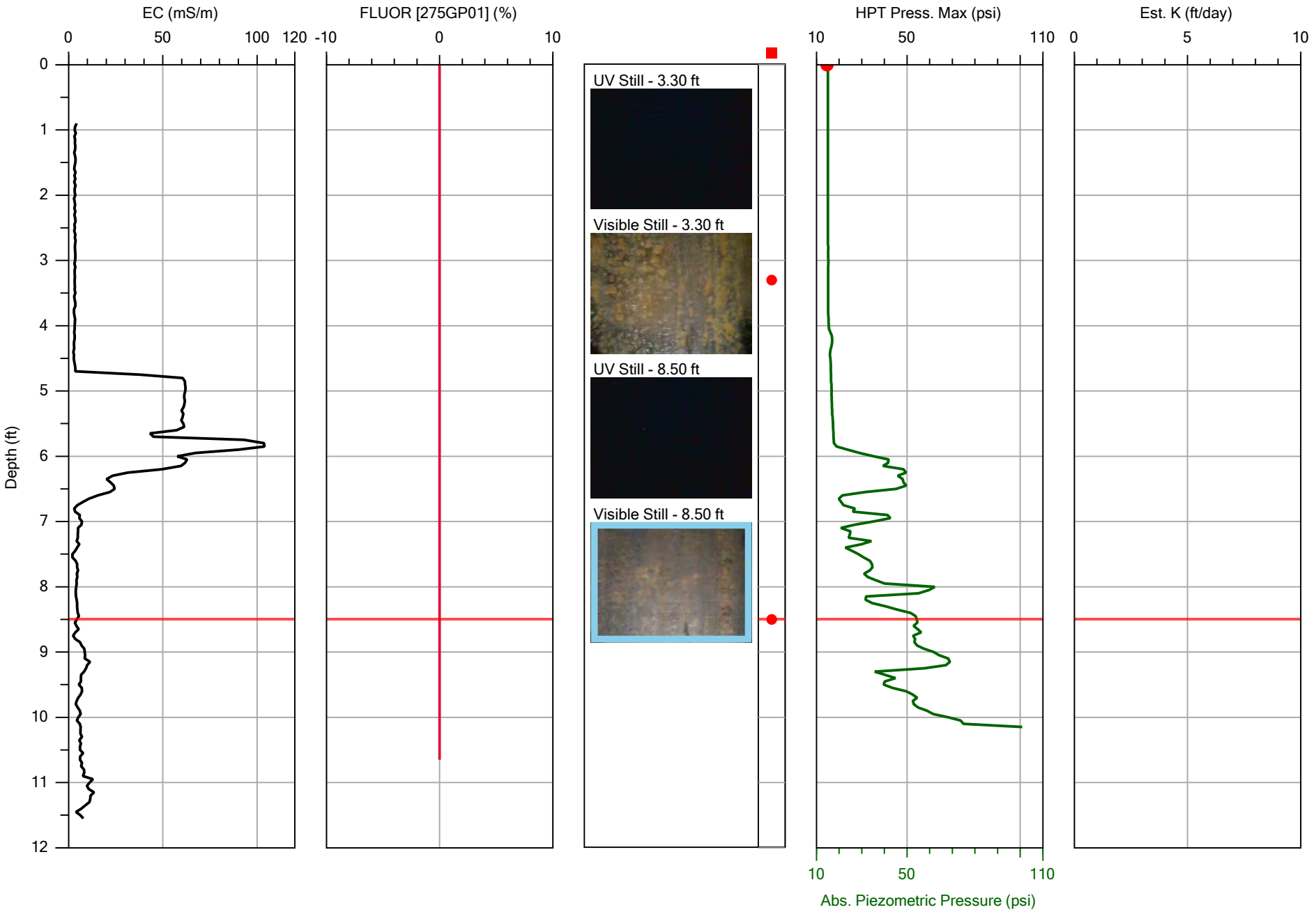
Post-Log EC Load Tests

Test	Target (mS/m)	Actual (mS/m)	% Diff	P/F
Low	55.0	56.5	2.8	PASS
High	360.0	343.6	4.6	PASS

********** USER NOTES **********

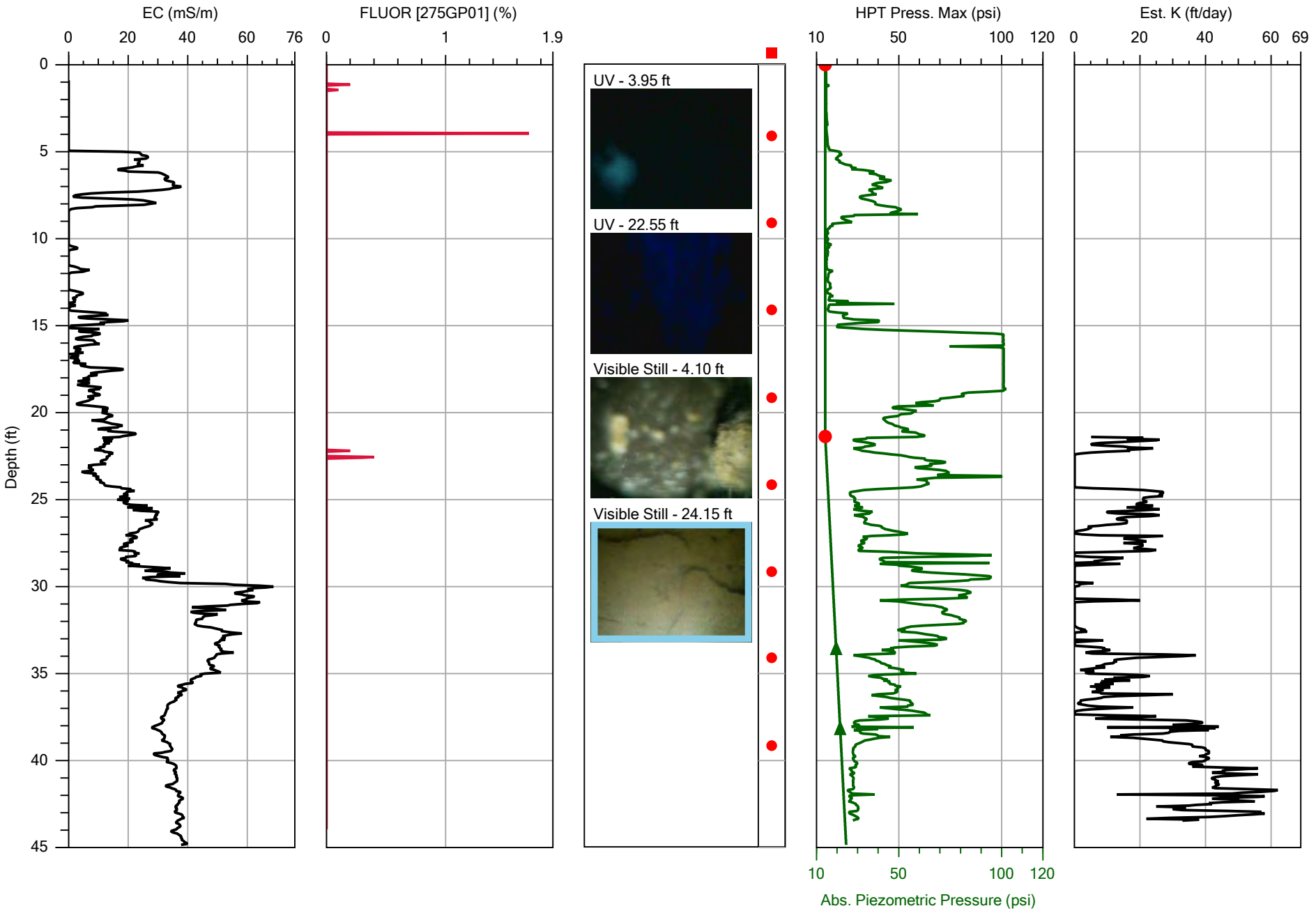
Pre Log Photodiode (V):
Black Box: .52279
Diesel: 1.476
Motor Oil: 2.716

Post Log Photodiode (V):
Black Box: .55076
Diesel: 1.74655
Motor Oil: 3.00393



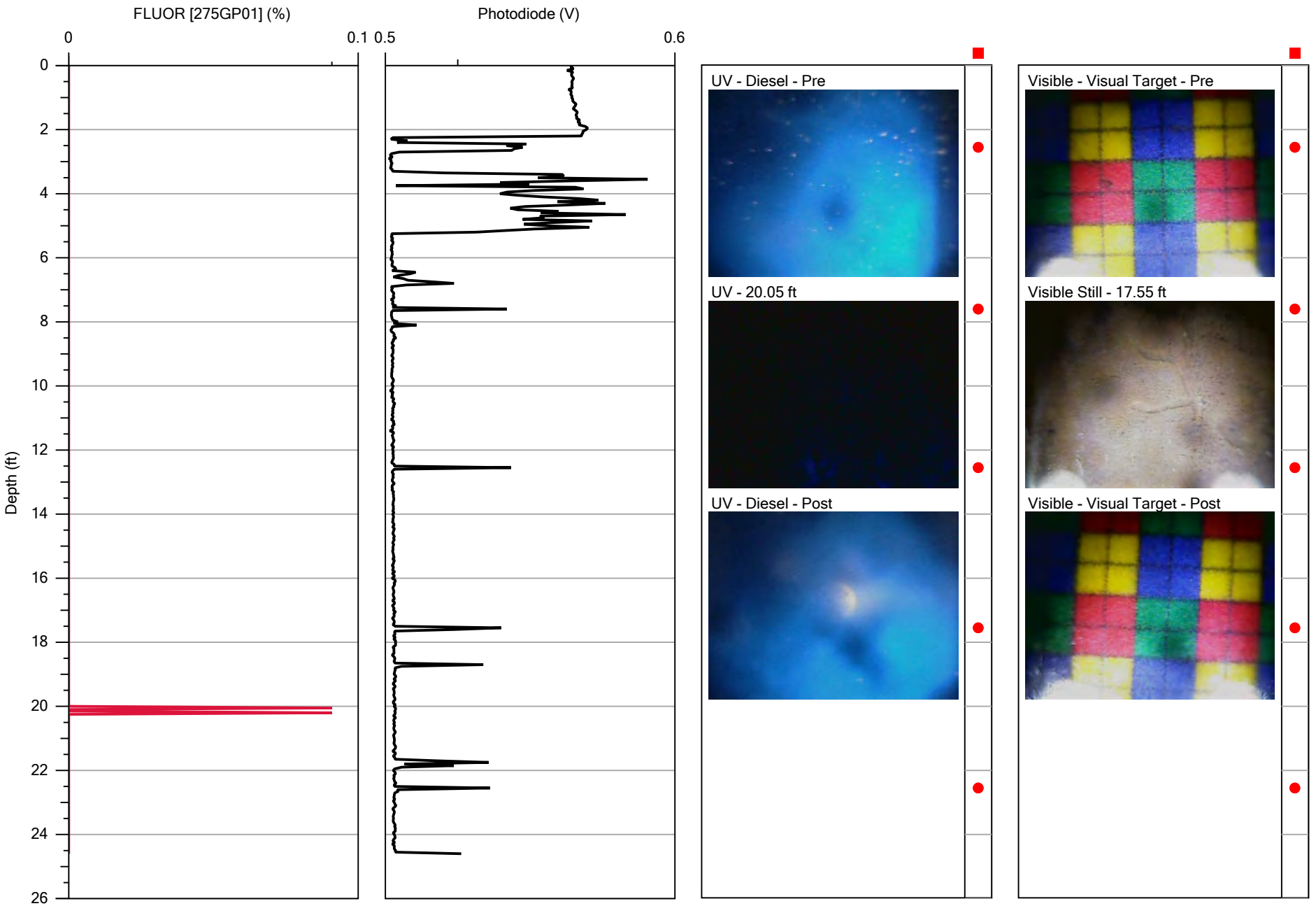
Direct Image® By Geoprobe Systems®

		File: CD-09B.OIHP
Company: Parratt-Wolff, Inc.	Operator: CJ	Date: 12/15/2021
Project ID: 21701	Client: Stantec	Location: PES



Direct Image® By Geoprobe Systems®

		File: CD-11A.OIHP
Company: Parratt-Wolff, Inc.	Operator: CJ	Date: 12/6/2021
Project ID: 21701	Client: Stantec	Location: PES



Direct Image® By Geoprobe Systems®

		File: CD-11A-UVR-1.OIHP
Company: Parratt-Wolff	Operator: Cliff Hannan	Date: 1/14/2022
Project ID: 21701	Client: Stantec	Location: PES

CD-11A-UVR-1.zip

SITE INFORMATION -- DIRECT IMAGE OIP+HPT PROBE

Geoprobe DI Acquisition Software for Windows
Version: 3.4   Build: 22011

Pre-Log EC Load Tests

Test	Target (mS/m)	Actual (mS/m)	% Diff	P/F
Low	55.0	53.0	3.6	PASS
High	360.0	336.7	6.5	PASS

COMPANY: Parratt-Wolff
OPERATOR: Cliff Hannan
PROJECT ID: 21701
CLIENT: Stantec
UNITS: ENGLISH
PROBE AND ARRAY: OIHPT-UVR UV275 with Top Dipole
LOCATION: PES
100 INCH STRING POT USED
ROD LENGTH: 5 feet

FILTER SETTINGS
Filter 0:
FILTER NAME: 275GPFilterEF001
FILTER GUID: 539c6c5b-435b-4181-b36d-01535f2f7a4f
T1: H[85-220] S[140-255] V[90-255]
T2: H[85-220] S[0-139] V[150-255]

Filter 1:
FILTER NAME: 275CFCrudeEH001
FILTER GUID: 246cb286-d63d-4bf9-a256-bcd2d80919ca
T1: H[0-145] S[0-127] V[90-255]
T2: H[0-0] S[0-0] V[0-0]

LOGGING MODE: 275

OIP PRE-LOG TEST

Visual Target	Visible	25.7
Black Box	UV	0.0
Diesel	UV	85.0
Motor Oil	UV	94.3

Frame grabber settings:
Brightness: 111
Contrast: 140
Hue: 0
Saturation: 200

PRE-LOG HPT REFERENCE TEST VALUES

PRE TEST TIME: Fri Jan 14 2022 12:07:22

TEST	HPT PRESSURE (psi)	FLOW (mL/min)	HPT PRESSURE (kPa)
TOP with FLOW=0	16.036	0.0	110.560
TOP with FLOW>0	16.143	234.1	111.300
BOTTOM with FLOW=0	15.950	0.0	109.970
BOTTOM with FLOW>0	16.063	237.2	110.750

EXPECTED FLOW=0 HPT DIFF.: 0.22 psi (1.5 kPa) +/- 10%
ACTUAL FLOW=0 HPT DIFF.: 0.09 psi (0.6 kPa)

TRANSDUCER TEST FAILED

HPT IDEAL COEFFS: 2.2696e1,-2.2356
HPT SENSOR CAL NUMBERS: DEFAULT, 0.000, 0.000, 0.000, 0.000, 2.587, -25.86
LOG START TIME: Fri Jan 14 2022 12:10:03

LOG END DEPTH: 24.60 ft (7.498 m)
LOG END TIME: Fri Jan 14 2022 12:25:46

LATITUDE: 0.000000000
LONGITUDE: 0.000000000
ELEVATION: 0.000 METERS 0.00 FEET
GPS Quality: None

OIP PRE/POST-LOG TEST RESULTS

Name	Light	Pre	Post	Dif
Visual Target	Visible	25.7	24.6	1.1
Black Box	UV	0.0	80.3	80.3
Diesel	UV	85.0	83.5	1.5
Motor Oil	UV	94.3	93.6	0.6

Frame grabber settings:
Brightness: 111
Contrast: 140
Hue: 0
Saturation: 200

POST-LOG HPT REFERENCE TEST VALUES

POST TEST TIME: Fri Jan 14 2022 12:38:17

TEST	HPT PRESSURE (psi)	FLOW (mL/min)	HPT PRESSURE (kPa)
TOP with FLOW=0	16.037	0.0	110.570
TOP with FLOW>0	16.135	233.4	111.250
BOTTOM with FLOW=0	15.962	0.0	110.060
BOTTOM with FLOW>0	16.051	233.0	110.670

EXPECTED FLOW=0 HPT DIFF.: 0.22 psi (1.5 kPa) +/- 10%
ACTUAL FLOW=0 HPT DIFF.: 0.08 psi (0.5 kPa)

TRANSDUCER TEST FAILED

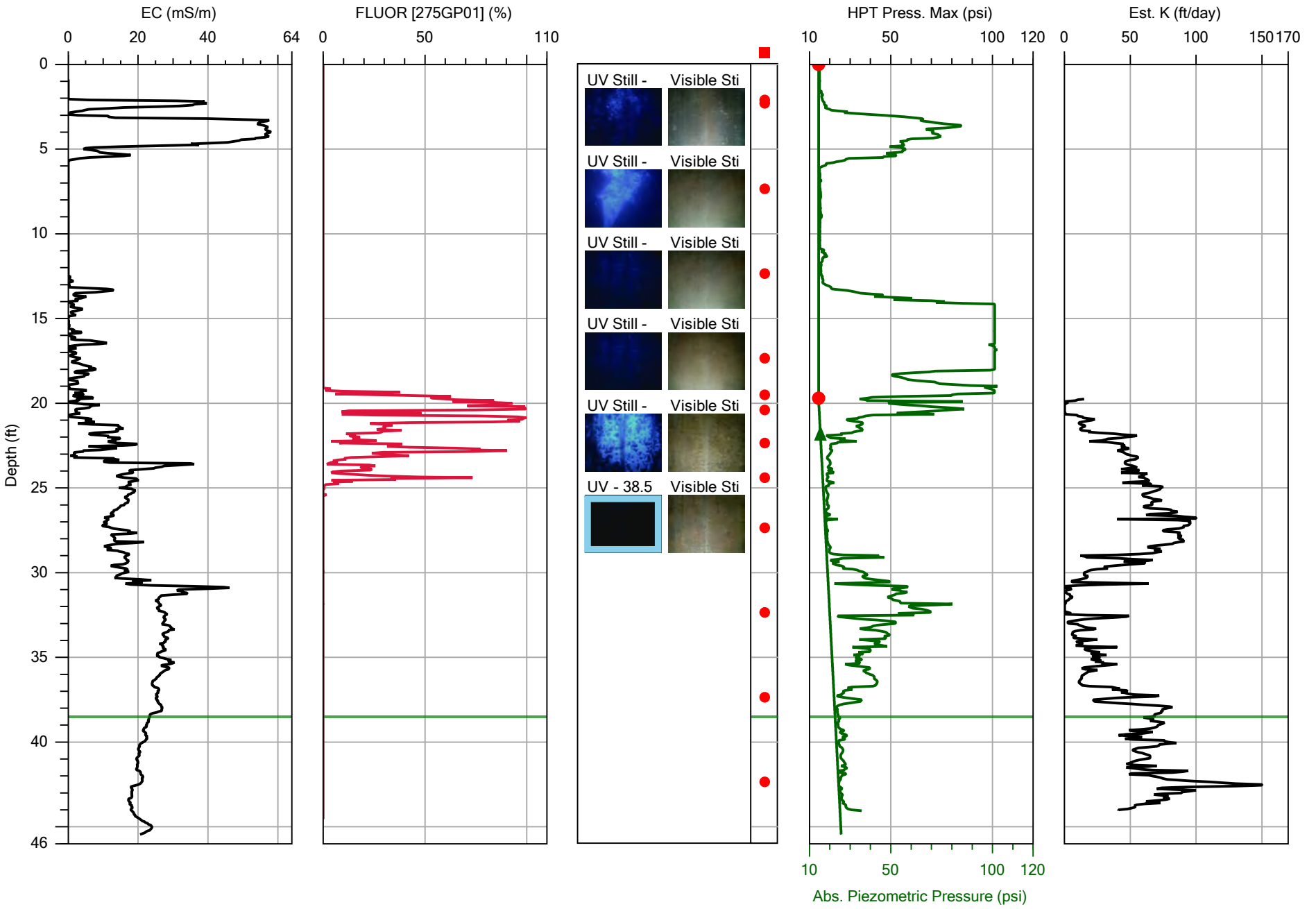
Post-Log EC Load Tests

Test	Target (mS/m)	Actual (mS/m)	% Diff	P/F
Low	55.0	58.7	6.7	PASS
High	360.0	338.2	6.1	PASS

********** USER NOTES **********

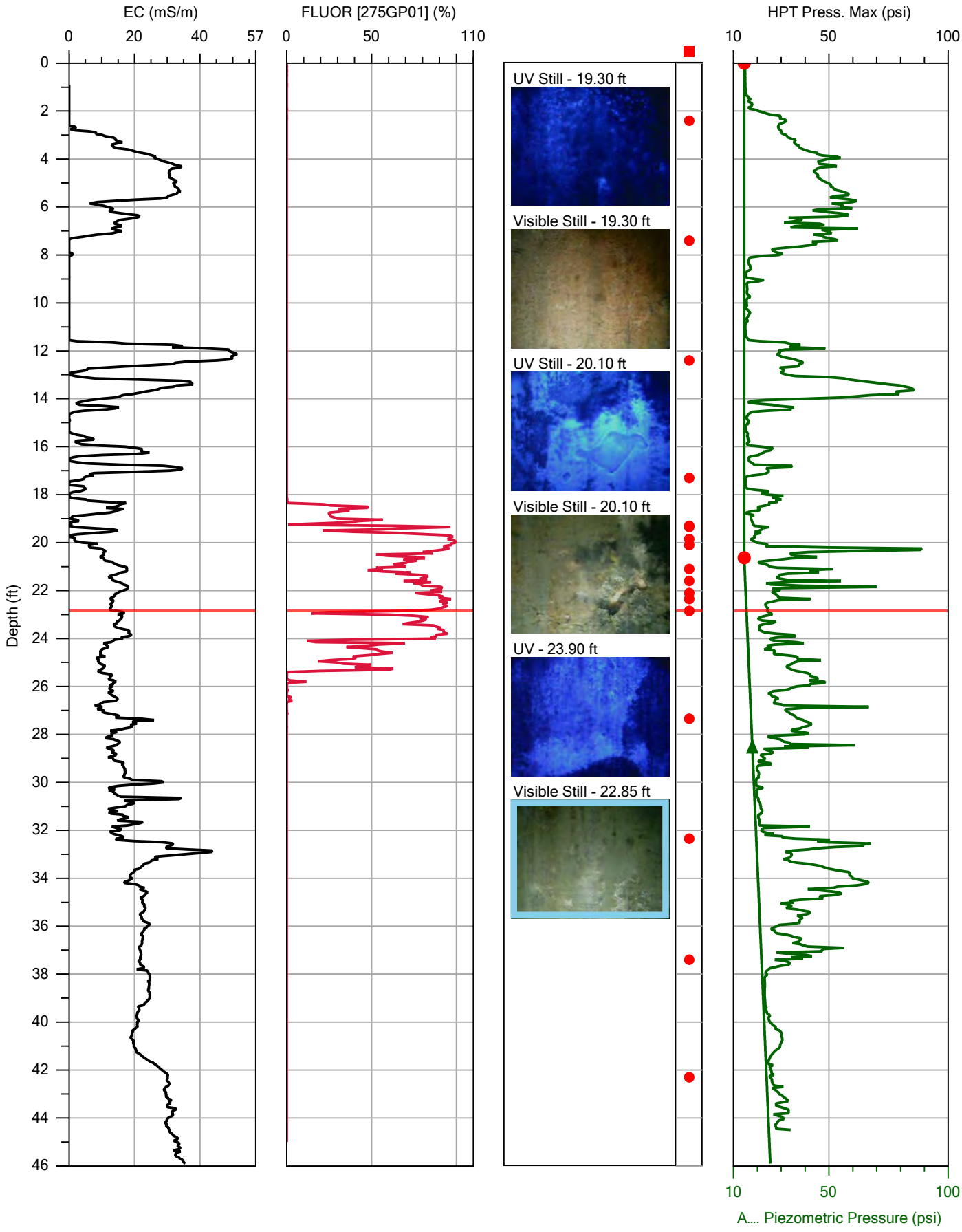
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Diesel: 1.66939
Motor Oil: 2.90725

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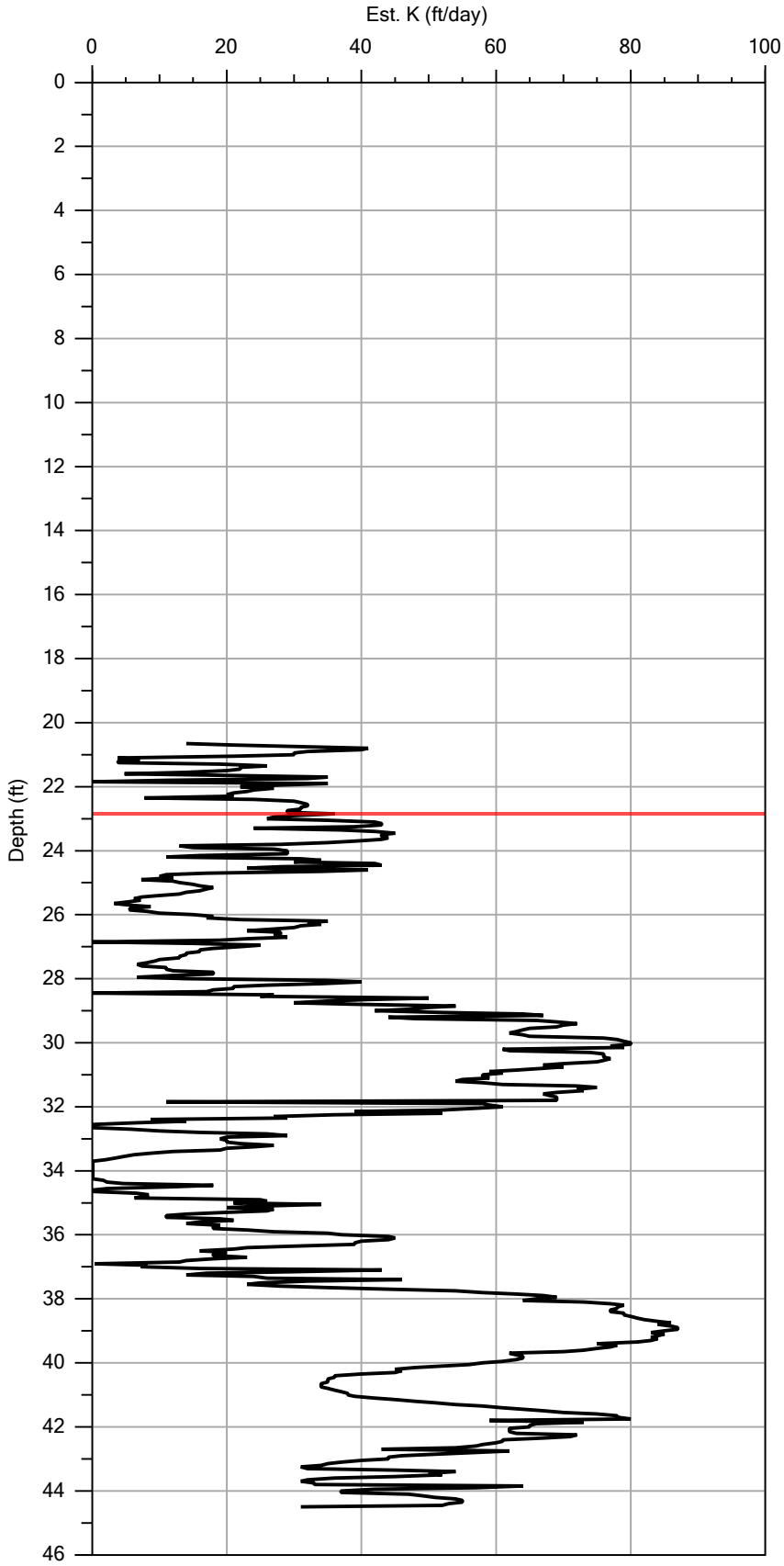


Direct Image® By Geoprobe Systems®

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Company: Parratt-Wolff, Inc.	Operator: CJ	Date: 12/7/2021
Project ID: 21701	Client: Stantec	Location: PES

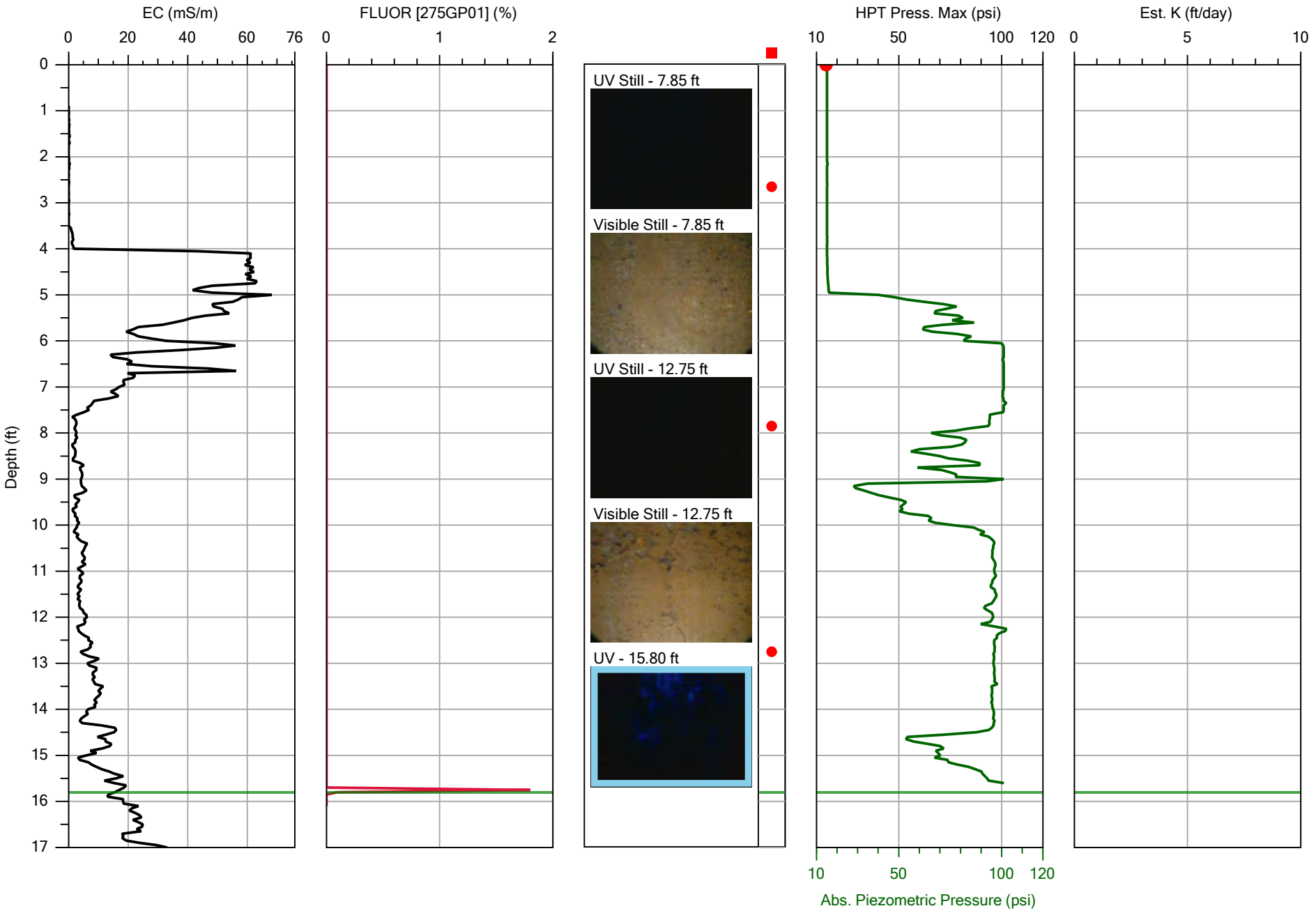


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Company: Parratt-Wolff, Inc.		Operator: CJ	Date: 12/7/2021
Project ID: 21701		Client: Stantec	Location: PES



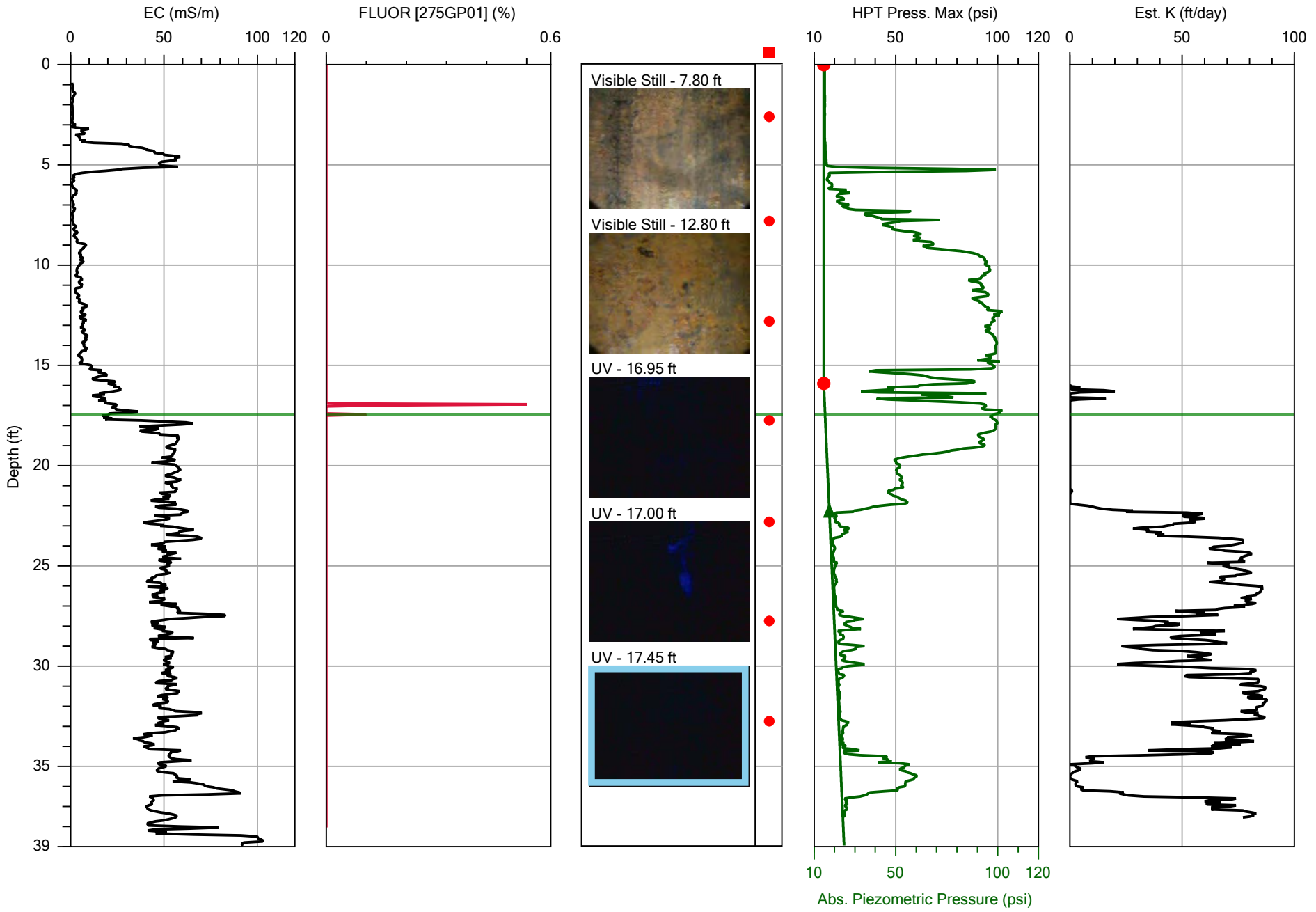
Direct Image® By Geoprobe Systems®

			File: CD-11C.OIHP
Company: Parratt-Wolff, Inc.		Operator: CJ	Date: 12/7/2021
Project ID: 21701		Client: Stantec	Location: PES



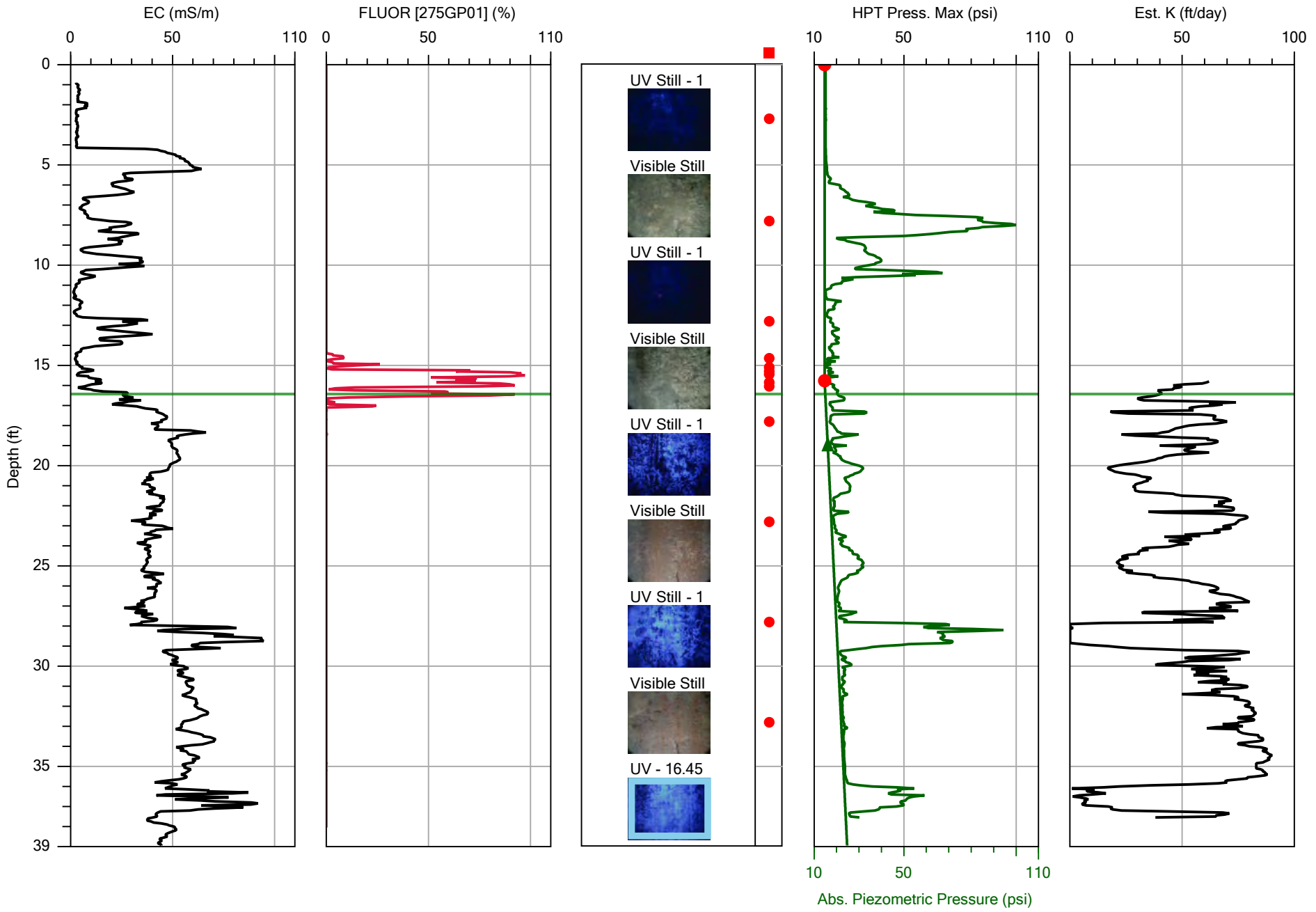
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Company: Parratt-Wolff, Inc.	Operator: CJ	Date: 12/15/2021
Project ID: 21701	Client: Stantec	Location: PES



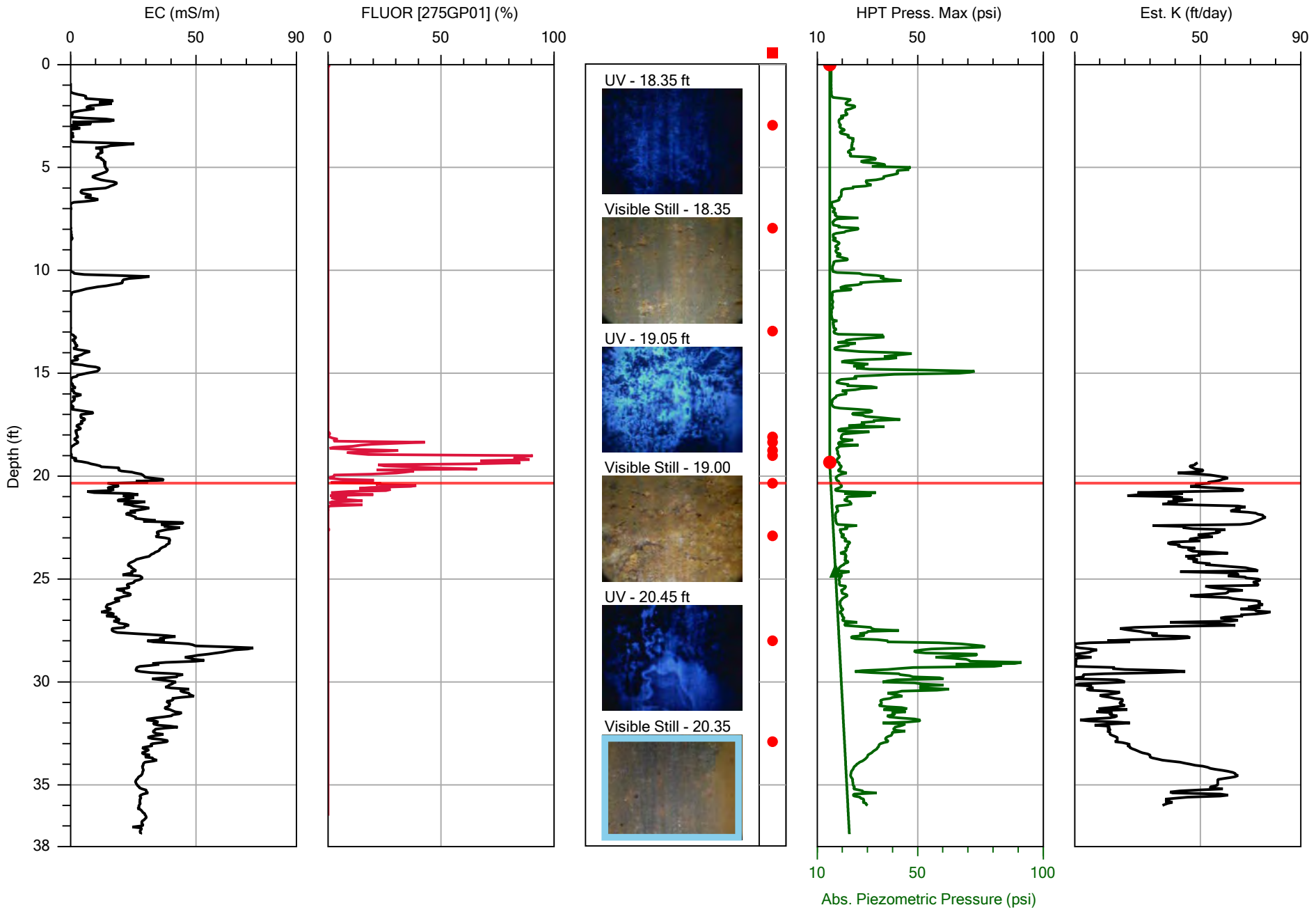
Direct Image® By Geoprobe Systems®

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Company: Parratt-Wolff, Inc.	Operator: CJ	Date: 12/15/2021
Project ID: 21701	Client: Stantec	Location: PES



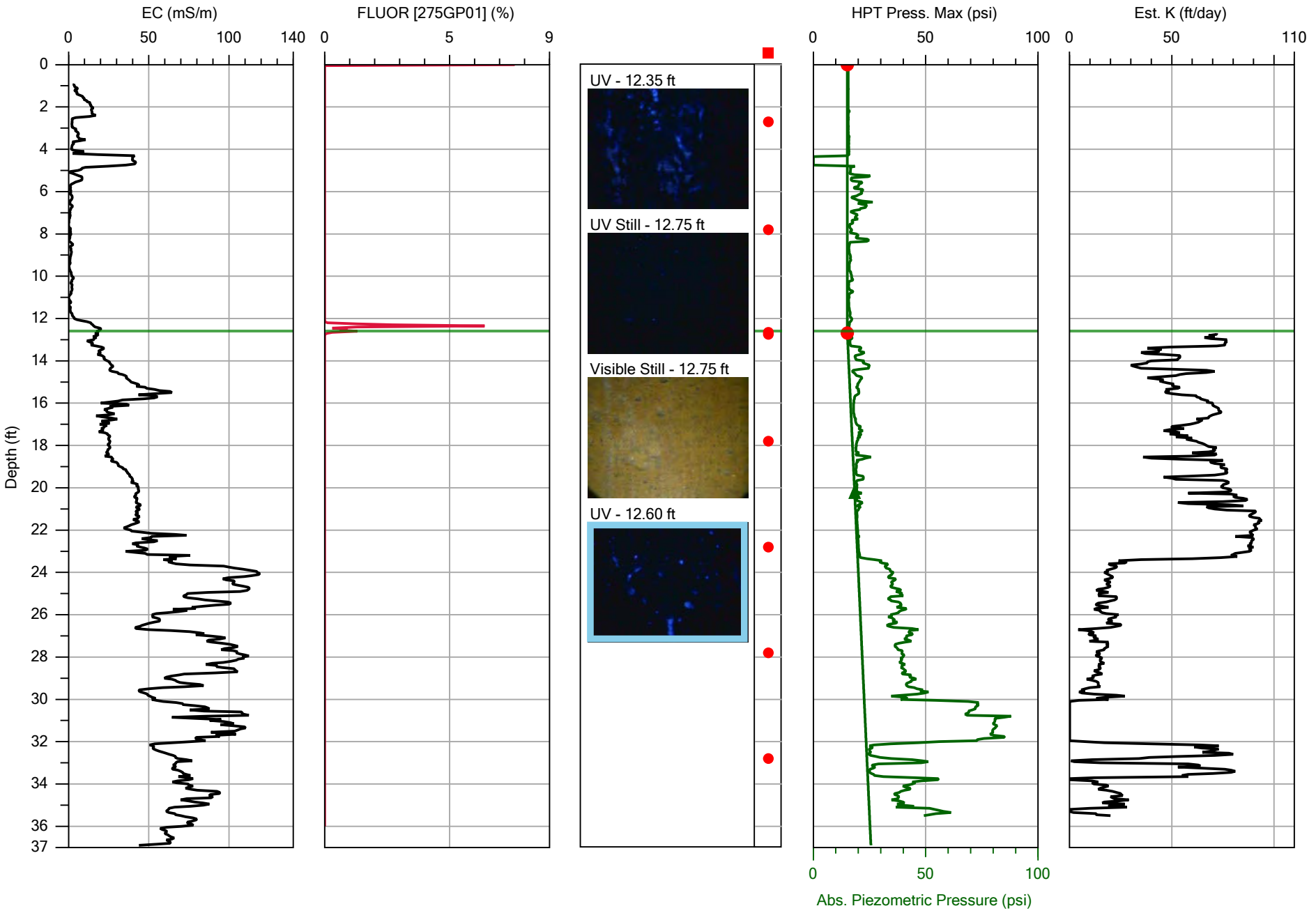
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Company: Parratt-Wolff, Inc.		Operator: CJ	Date: 12/15/2021
Project ID: 21701		Client: Stantec	Location: PES

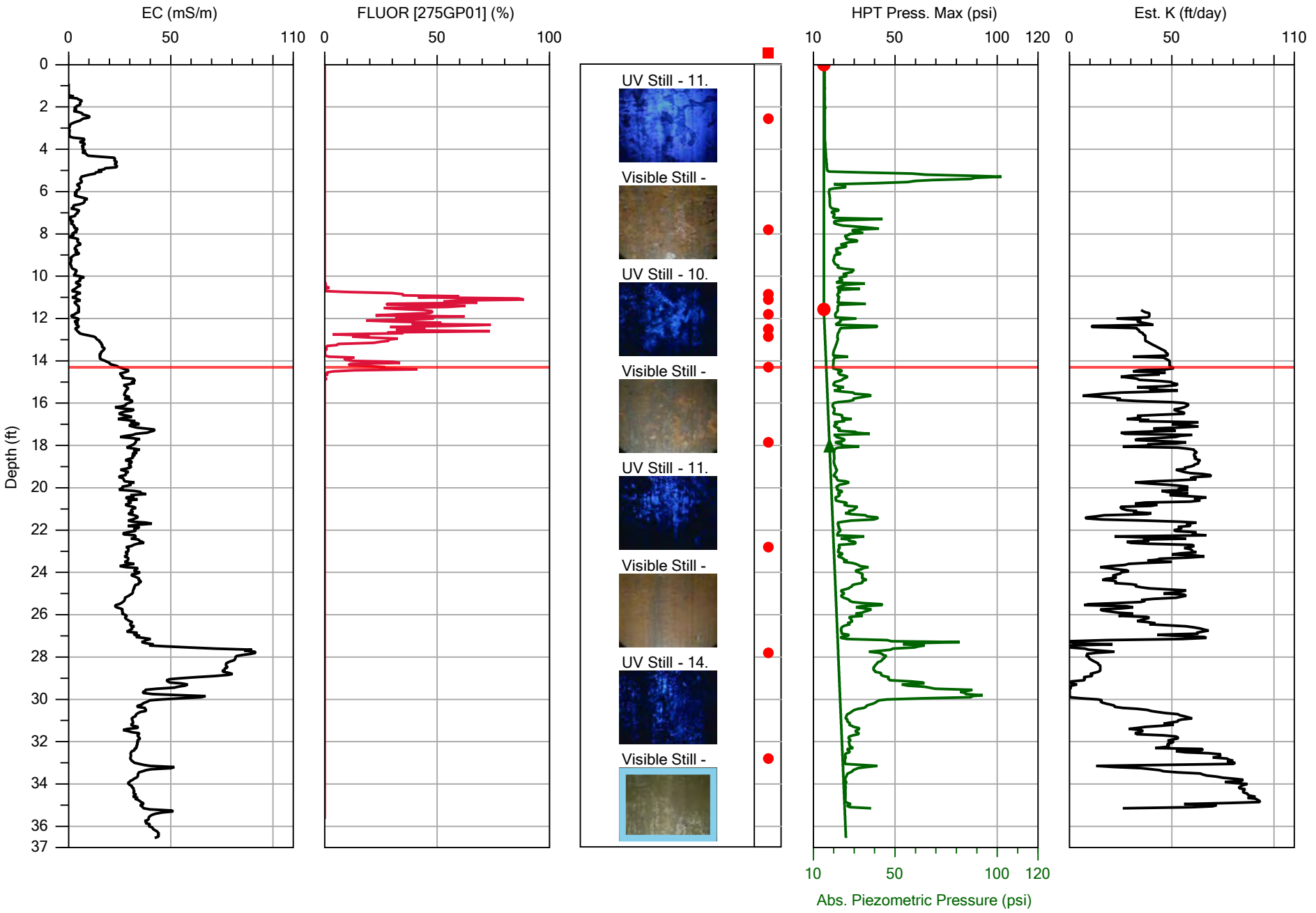


Direct Image® By Geoprobe Systems®

		File: OIHPT-01.OIHP
Company: Parratt-Wolff, Inc.	Operator: CJ	Date: 12/8/2021
Project ID: 21701	Client: Stantec	Location: PES



			File: OIHPT-02.OIHP
Company: Parratt-Wolff, Inc.		Operator: CJ	Date: 12/10/2021
Project ID: 21701		Client: Stantec	Location: PES



Direct Image® By Geoprobe Systems®

		File: OIHPT-04.OIHP
Company: Parratt-Wolff, Inc.	Operator: CJ	Date: 12/10/2021
Project ID: 21701	Client: Stantec	Location: PES

Appendix P Sensitivity Analysis for Transport Model

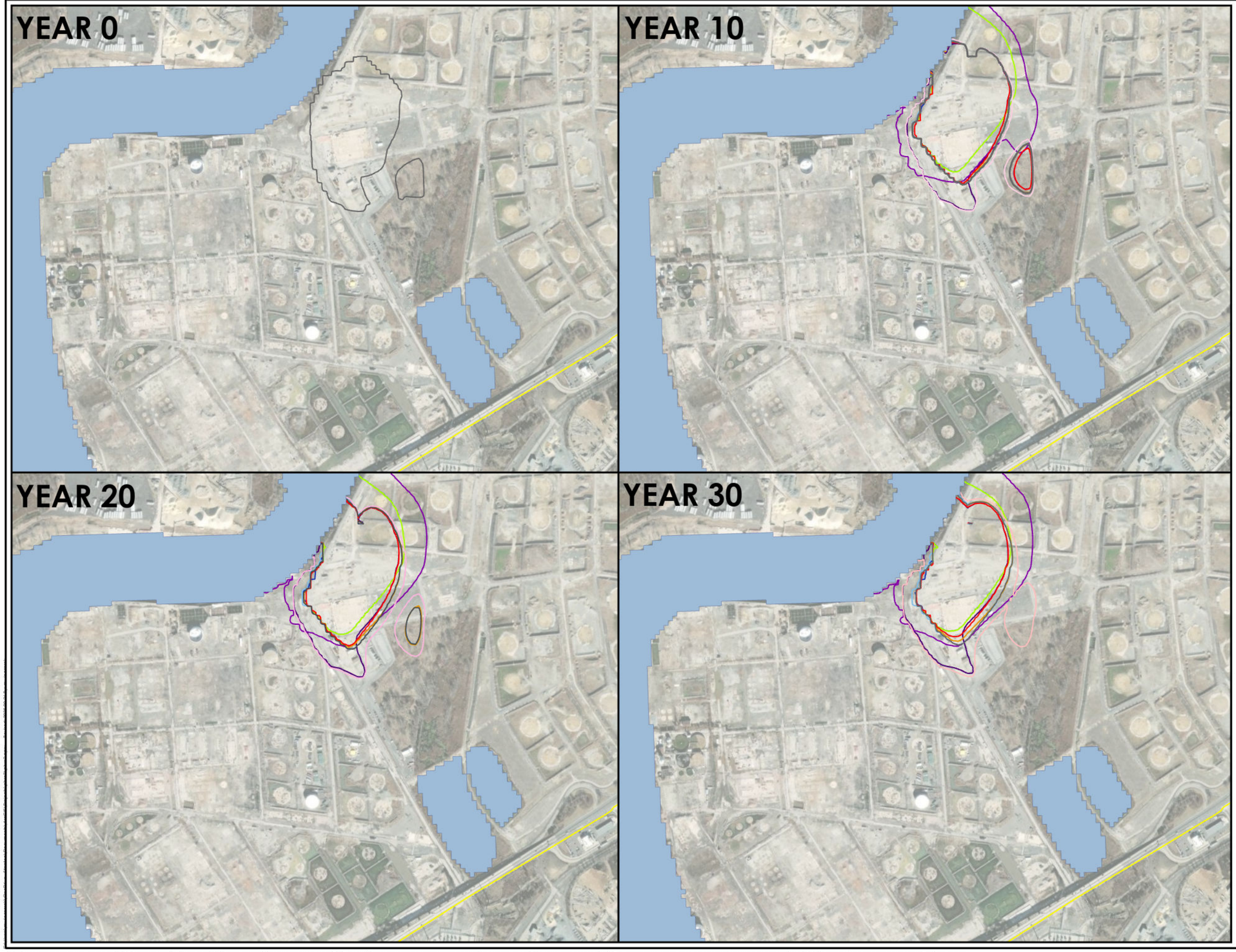


Figure No.

...

Title

BENZENE SENSITIVITY ANALYSIS RESULTS - WATER TABLE

Client/Project

PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:

City of Philadelphia, Pennsylvania

213403039
Prepared by I.ICW on 9/26/2025
Technical Review by JT on 9/26/2025
Independent Review by AK on 9/26/2025

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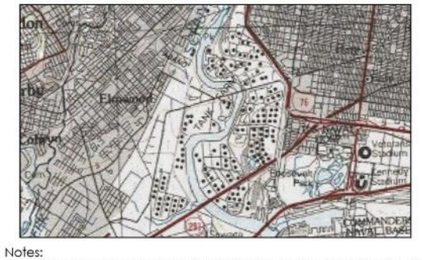
N

Legend

River Boundary

Sensitivity Analysis Simulated Benzene Dissolved Phase Isocontours (5 ug/L)

- 0: Base Simulation
- 1: No Degradation
- 2: Increased Degradation
- 3: Reduced Dispersity
- 4: Increased Retardation
- 5: No Retardation
- 6: Continuous Source
- 7: No Source
- 8: Combined (More Conservative)
- 9: Combined (Less Conservative)

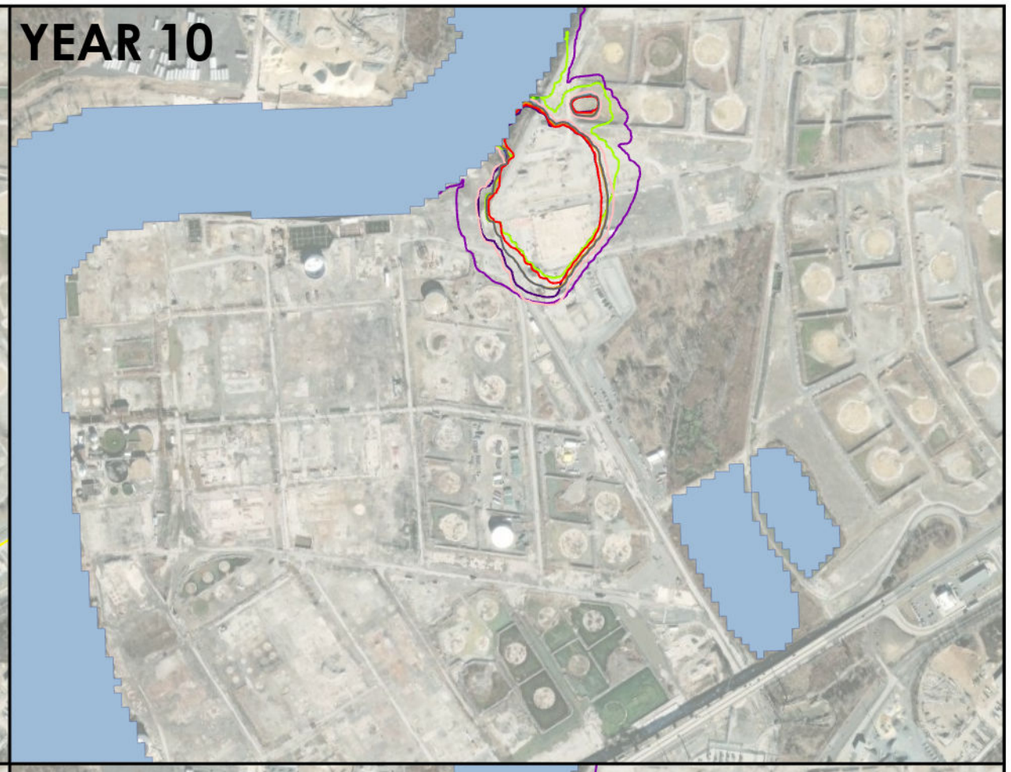


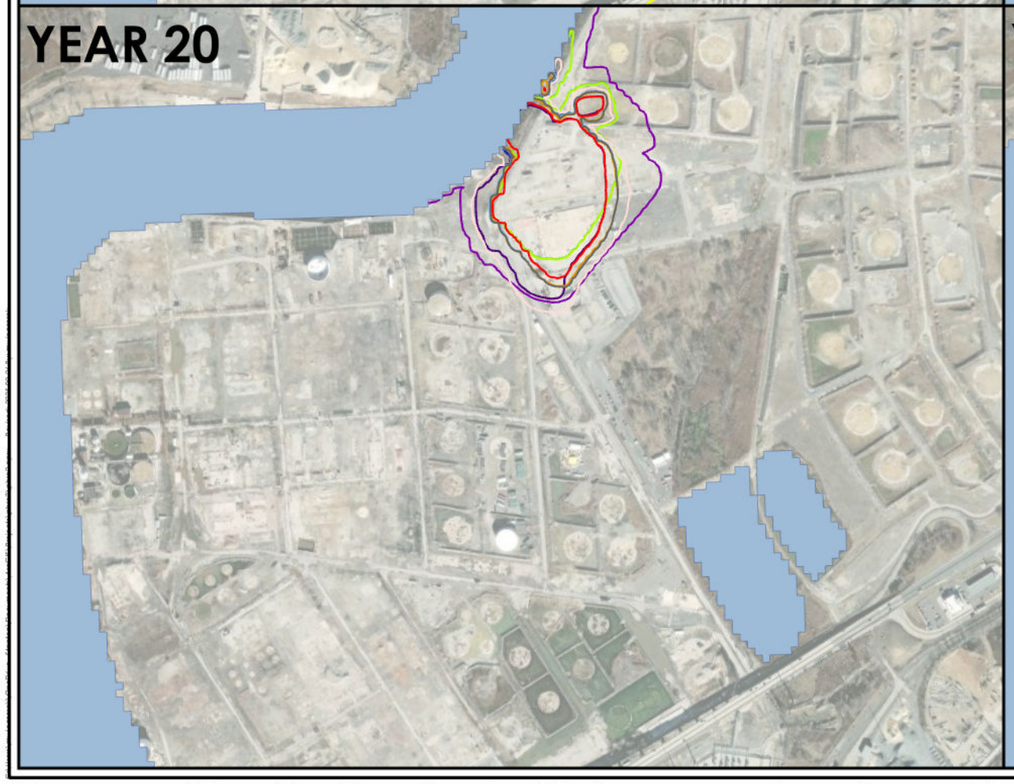
Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: USA Topo Maps: Copyright:© 2013 National Geographic Society, i-cubed
World Imagery: Maxar
4. ug/L = Micrograms per liter
5. See Table 4-6 for a detailed summary of sensitivity analysis model input parameters.

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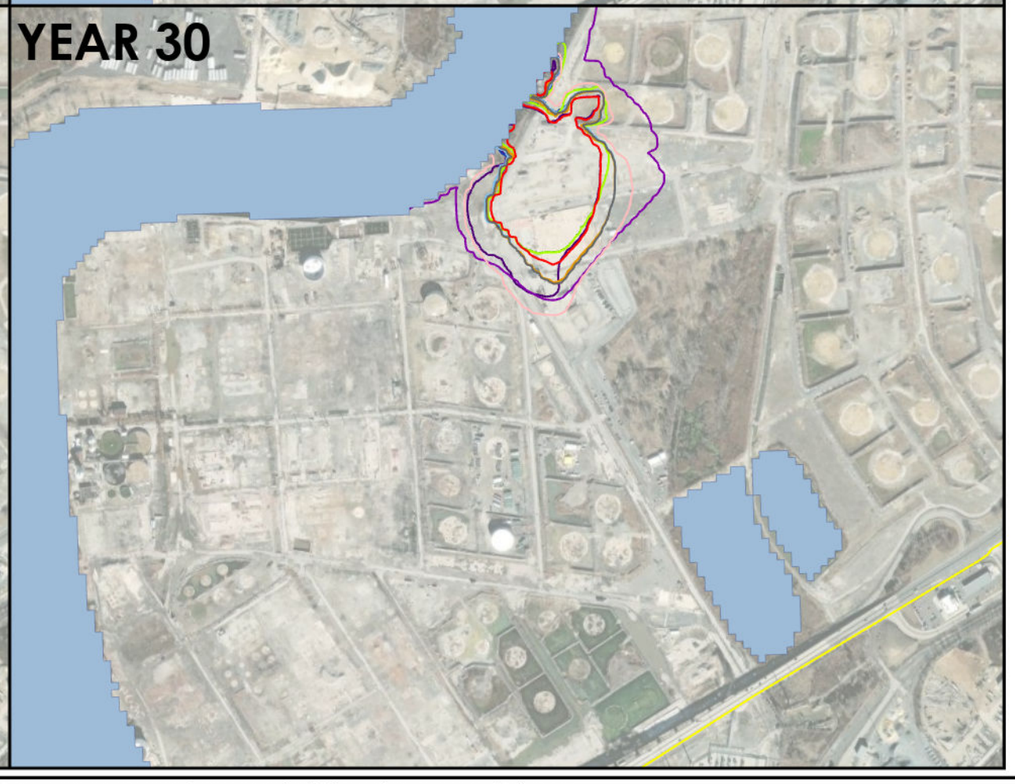


Figure No.

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Title

BENZENE SENSITIVITY ANALYSIS RESULTS - LAYER 3

Client/Project

PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213403039
Prepared by I.ICW on 9/26/2025
Technical Review by JT on 9/26/2025
Independent Review by AK on 9/26/2025

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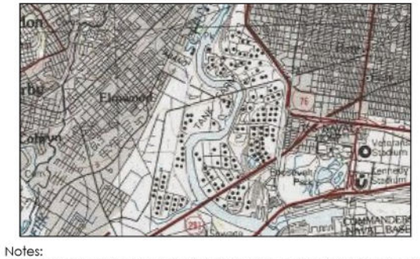
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Legend

River Boundary

Sensitivity Analysis Simulated Benzene Dissolved Phase Isocontours (5 ug/L)

- 0: Base Simulation
- 1: No Degradation
- 2: Increased Degradation
- 3: Reduced Dispersity
- 4: Increased Retardation
- 5: No Retardation
- 6: Continuous Source
- 7: No Source
- 8: Combined (More Conservative)
- 9: Combined (Less Conservative)

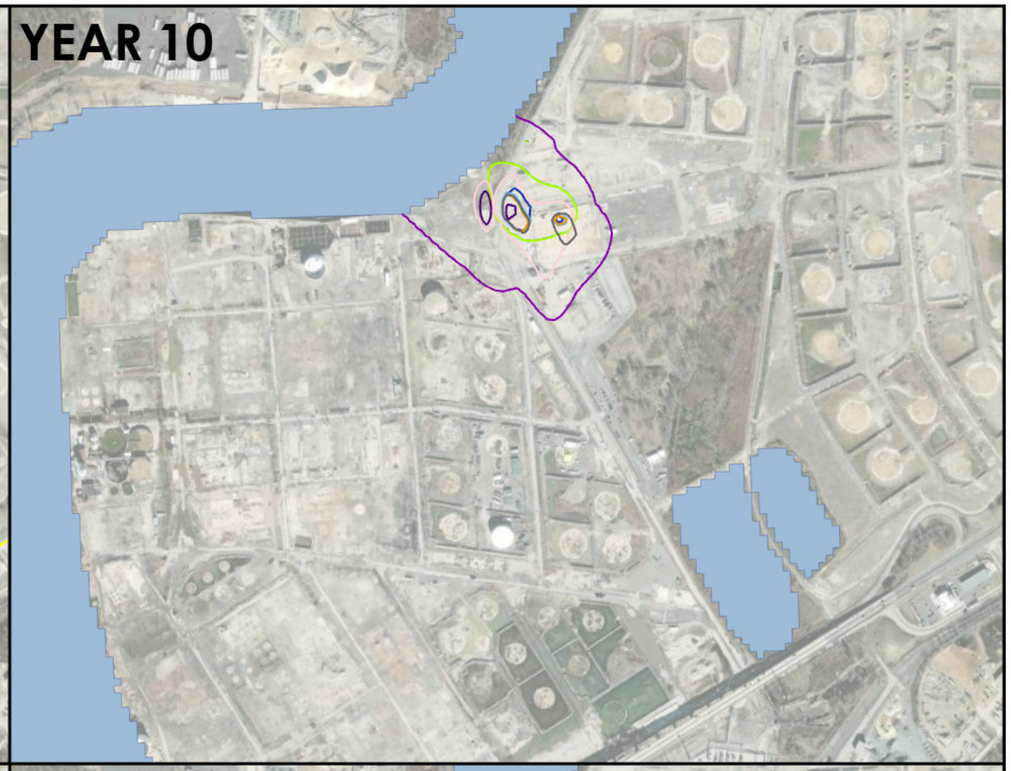


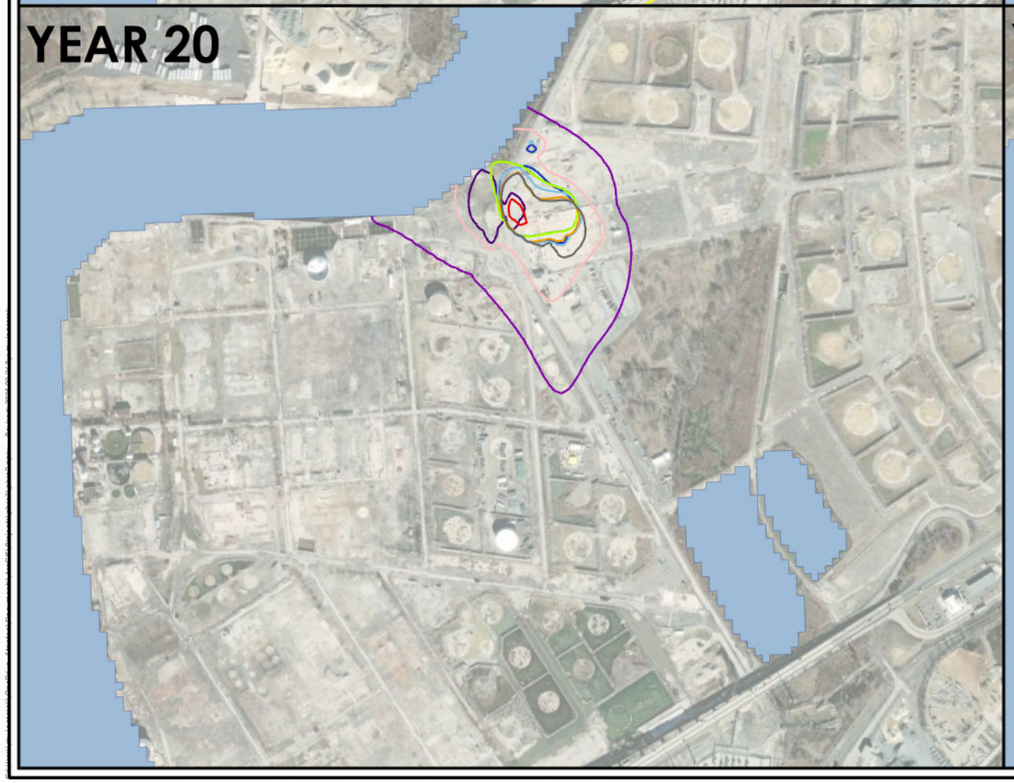
Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: USA Topo Maps: Copyright:© 2013 National Geographic Society, i-cubed
World Imagery: Maxar
4. ug/L = Micrograms per liter
5. See Table 4-6 for a detailed summary of sensitivity analysis model input parameters.

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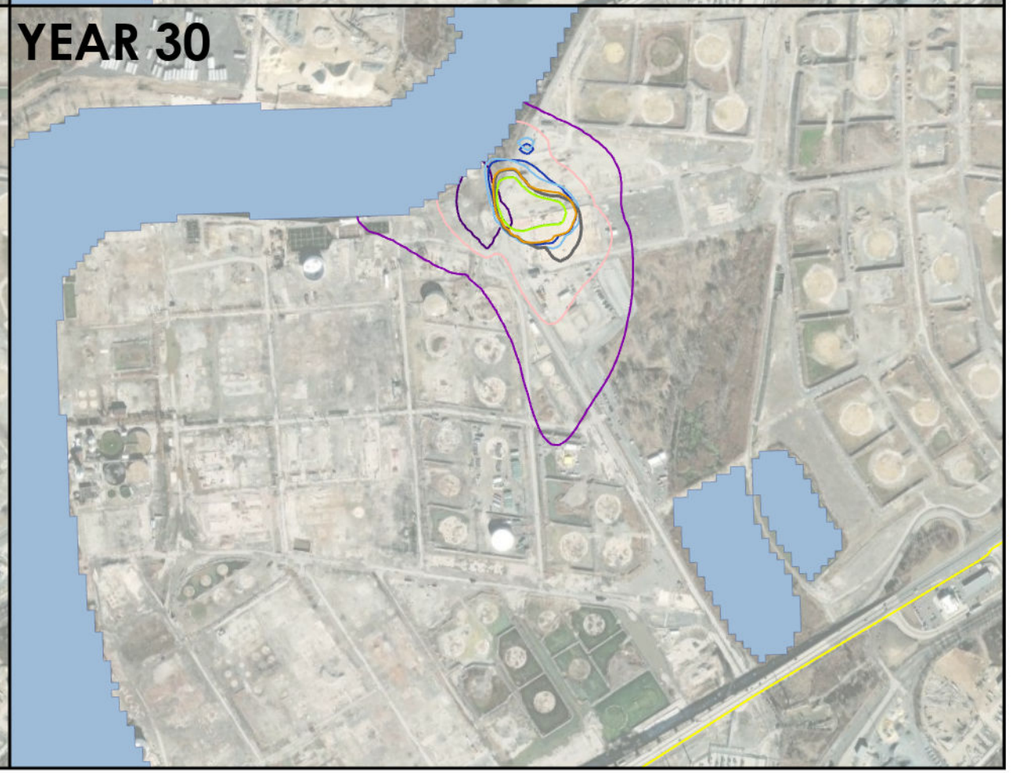


Figure No.

...

Title

BENZENE SENSITIVITY ANALYSIS RESULTS - LAYER 5

Client/Project

PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:

City of Philadelphia, Pennsylvania

213403039
Prepared by I.ICW on 9/26/2025
Technical Review by JT on 9/26/2025
Independent Review by AK on 9/26/2025

0 650 1,300 Feet

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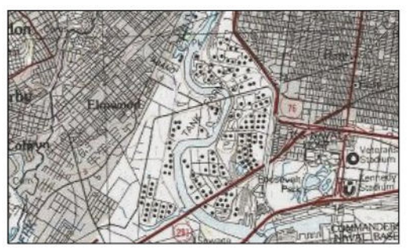
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Legend

River Boundary

Sensitivity Analysis Simulated Benzene Dissolved Phase Isocontours (5 ug/L)

- 0: Base Simulation
- 1: No Degradation
- 2: Increased Degradation
- 3: Reduced Dispersity
- 4: Increased Retardation
- 5: No Retardation
- 6: Continuous Source
- 7: No Source
- 8: Combined (More Conservative)
- 9: Combined (Less Conservative)



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: USA Topo Maps: Copyright:© 2013 National Geographic Society, i-cubed
World Imagery: Maxar
4. ug/L = Micrograms per liter
5. See Table 4-6 for a detailed summary of sensitivity analysis model input parameters.

Stantec

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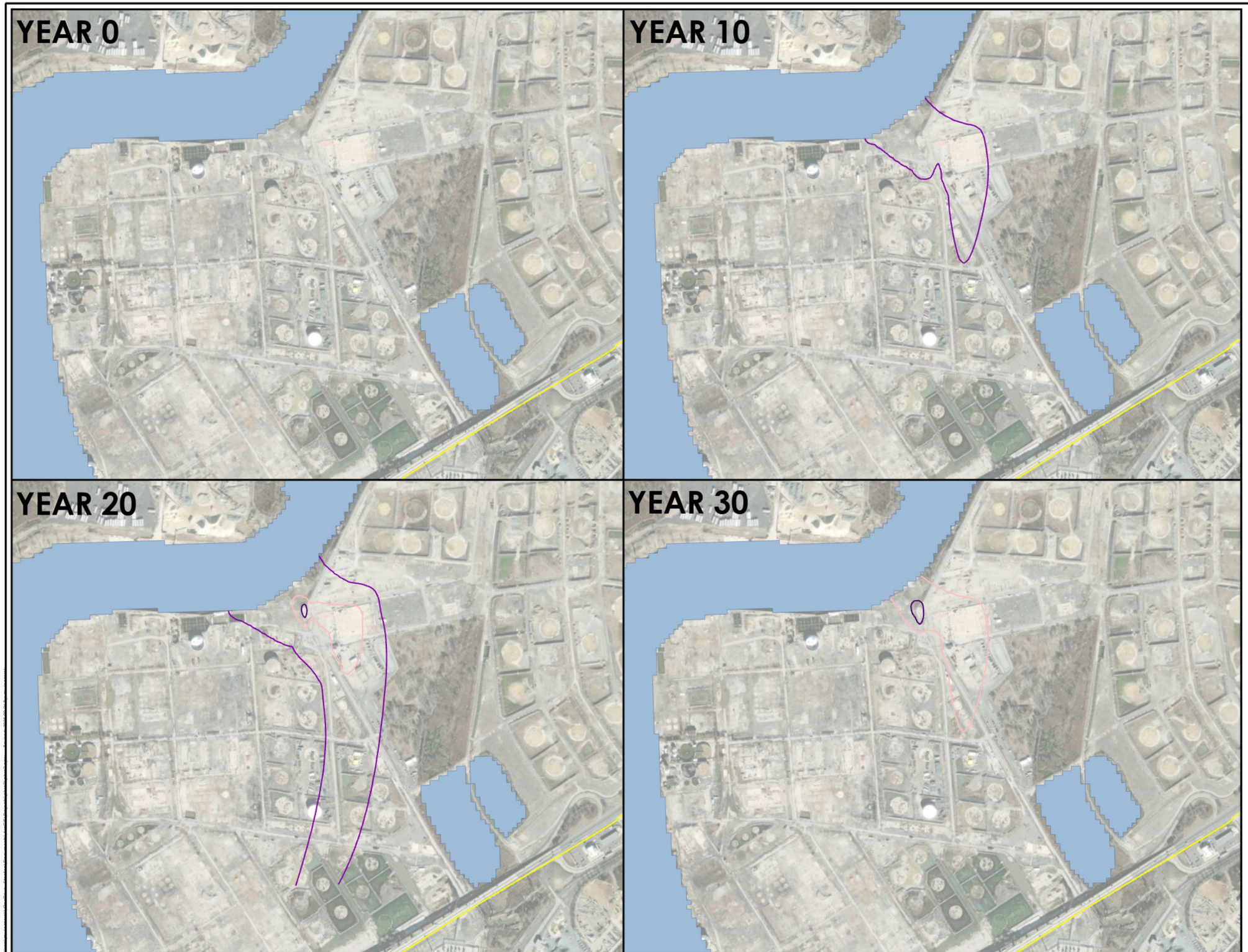


Figure No.

•••

Title

BENZENE SENSITIVITY ANALYSIS RESULTS - LAYER 7

Client/Project

PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:

City of Philadelphia, Pennsylvania

213403039
Prepared by I.ICW on 9/26/2025
Technical Review by JT on 9/26/2025
Independent Review by AK on 9/26/2025

0 650 1,300 Feet

1:130,000 (At Original document size of 11x17)

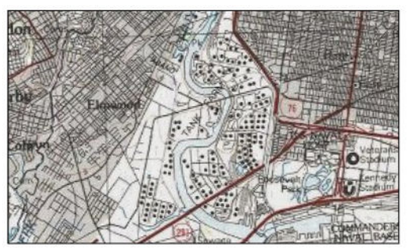
N

Legend

River Boundary

Sensitivity Analysis Simulated Benzene Dissolved Phase Isocontours (5 ug/L)

- 0: Base Simulation
- 1: No Degradation
- 2: Increased Degradation
- 3: Reduced Dispersity
- 4: Increased Retardation
- 5: No Retardation
- 6: Continuous Source
- 7: No Source
- 8: Combined (More Conservative)
- 9: Combined (Less Conservative)



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: USA Topo Maps: Copyright:© 2013 National Geographic Society, i-cubed
World Imagery: Maxar
4. ug/L = Micrograms per liter
5. See Table 4-6 for a detailed summary of sensitivity analysis model input parameters.

Stantec

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Appendix Q TMS Wasteload Allocation Results

Discharge Information

Instructions | Discharge | Stream

Facility: **Former PES Refining Complex** NPDES Permit No.: **NA** Outfall No.: **UDEX Relea**

Evaluation Type: **Custom / Additives** Wastewater Description: **groundwater, dissolved benzene/toluene**

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.0000224	100	6.55						

				0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
BenzeneAWQC	µg/L		3288									
Toluene	µg/L		0.1									

Stream / Surface Water Information

Former PES Refining Complex, NPDES Permit No. NA, Outfall UDEX Release

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Schuylkill River**

No. Reaches to Model: **1**

- (●) Statewide Criteria
- ( ) Great Lakes Criteria
- ( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi^2)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	000833	2.85	-20	1900.75			Yes
End of Reach 1	000833	2.6	-20.1	1900.81			Yes

Q 7-10

Location	RMI	LFY (cfs/mi^2)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	2.85	0.1										100	7		
End of Reach 1	2.6	0.1													

Q h

Location	RMI	LFY (cfs/mi^2)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	2.85														
End of Reach 1	2.6														

Model Results

Former PES Refining Complex, NPDES Permit No. NA, Outfall UDEX Release

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | (•) All | ( ) Inputs | ( ) Results | ( ) Limits

☑ ***Hydrodynamics***

Q_{7-10}

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
2.85	190.08		190.08	0.00003	0.00008	1.232	265.992	215.898	0.58	0.026	8147.452
2.6	190.08		190.081								

Q_h

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
2.85	729.07		729.07	0.00003	0.00008	2.226	265.992	119.497	1.231	0.012	3354.94
2.6	729.09		729.09								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.043 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
BenzeneAWQC	0	0		0	640	640	#########	
Toluene	0	0		0	1,700	1,700	#########	

☑ ***CFC*** CCT (min): 720 PMF: 0.297 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
BenzeneAWQC	0	0		0	130	130	#########	
Toluene	0	0		0	330	330	#########	

☑ ***THH*** CCT (min): 720 PMF: 0.297 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments

BenzeneAWQC	0	0		0	N/A	N/A	N/A	
Toluene	0	0		0	57	57.0	92,943,096	

☑ ***CRL*** CCT (min): 720 PMF: 0.463 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
BenzeneAWQC	0	0		0	90	90.0	#########	
Toluene	0	0		0	N/A	N/A	N/A	

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

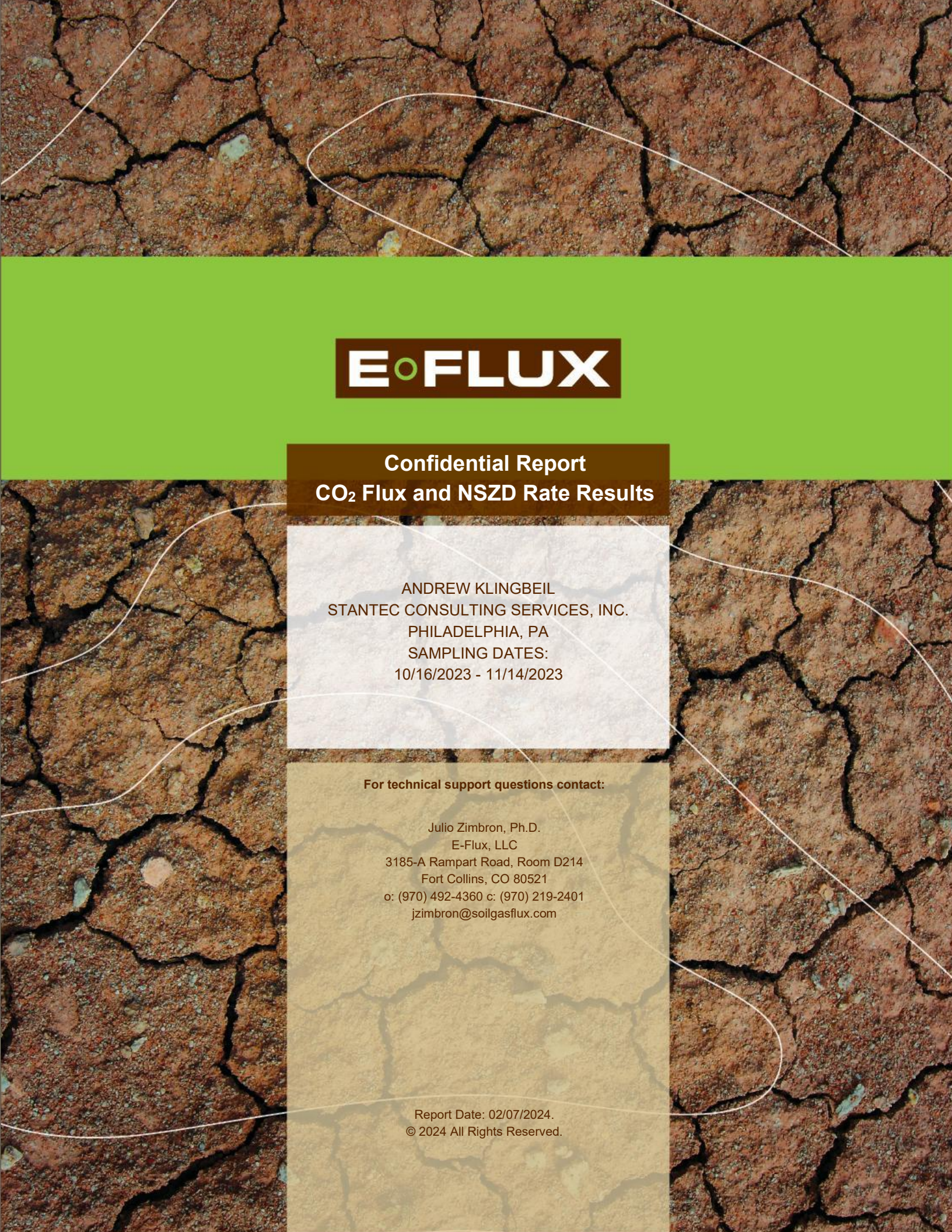
	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
BenzeneAWQC	96,545,911	µg/L	Discharge Conc ≤ 25% WQBEL
Toluene	92,943,096	µg/L	Discharge Conc ≤ 25% WQBEL

Appendix R E-Flux Report



Confidential Report
CO_2 Flux and NSZD Rate Results

ANDREW KLINGBEIL
STANTEC CONSULTING SERVICES, INC.
PHILADELPHIA, PA

SAMPLING DATES:
10/16/2023 - 11/14/2023

For technical support questions contact:

Julio Zimbron, Ph.D.
E-Flux, LLC
3185-A Rampart Road, Room D214
Fort Collins, CO 80521
o: (970) 492-4360 c: (970) 219-2401
jzimbron@soilgasflux.com

Report Date: 02/07/2024.

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The purpose of this document is to provide sample calculations for the reported results and to explain the method for differentiating petroleum hydrocarbon-derived CO_2 from that produced from natural soil respiration processes. The value of the ^{14}C analysis, site-specific study results and applicable notes, calculation explanations, and references are included.

The Value of the ^{14}C Analysis

How to differentiate between petroleum hydrocarbon-derived CO_2 and natural process-derived CO_2 using CO_2 flux traps:

Unimpacted soils naturally produce CO_2 due to microbial root zone activity and/or the degradation of natural organic matter. Thus, the total measured CO_2 flux at an impacted location is a function of the rates of both natural soil respiration and LNAPL degradation (Sihota and Mayer, 2012). The latter, which is caused by Natural Source Zone Depletion (NSZD), can be estimated by subtracting measured CO_2 fluxes at unimpacted locations from the total measured CO_2 fluxes at LNAPL-impacted locations (Sihota and Mayer, 2012). This spatial "background correction" assumes that bio-based CO_2 fluxes are similar at both impacted and unimpacted locations. This approach is complicated to implement, given that at many industrial facilities it is difficult to find unimpacted areas and vegetation cover can vary across a site. Alternatively, carbon isotope analysis can be used to carry out a location-specific correction for total measured CO_2 fluxes, and this approach effectively overcomes the limitations of the background correction.

Theory of Carbon Isotope Analysis:

Our method for NSZD rate estimation relies on the analysis of ^{14}C, an unstable carbon isotope with an absolute half-life of 5,730 years. ^{14}C is generated by cosmic rays in the atmosphere and is quickly oxidized to $^{14}CO_2$; thus, bio-based living carbon is ^{14}C-rich, while ancient fossil fuel carbon is completely ^{14}C-depleted. Additionally, bio-based organic carbon and the atmosphere have the same characteristic amount of ^{14}C. The short half-life of ^{14}C only allows for dating of samples younger than 60,000 years using accelerator mass spectrometry (Stuiver and Polach, 1977). ^{14}C analysis can therefore be used to differentiate between anthropogenic (i.e., fossil fuel) and natural sources of atmospheric carbon (see Klouda and Connolly, 1995; Levin et al., 1995; Avery et al., 2006), and this analysis is the basis for ASTM D6866-18.

For samples that contain both bio-based and fossil fuel-derived carbon, such as E-Flux's fossil fuel traps, measurement of ^{14}C enables quantitation of *both* source contributions. The fossil fuel-derived percentage of the sample (ff_{sample}) and the bio-based percentage (*1-*ff_{sample},* or bb_{sample}) are related by the following two-component mass balance (modified from Avery, Jr. et al., 2006):

$$Fm_{sample} = (ff_{sample})(Fm_{ff}) + (1 - ff_{sample})(Fm_{atm})$$

Here, Fm_x represents the fraction modern, a measure of how close the present $^{14}C/^{12}C$ ratio of the sample is to the ratio from 1950, which is derived from a pre-industrial era standard. Fm_{sample} is the total measured fraction modern of the sample. Fm_{ff} is the fraction modern of only the fossil fuel portion of the sample. This number is 0, as there is no ^{14}C in fossil fuel-derived CO_2. Fm_{atm} is the fraction modern of the part of the sample derived from natural soil respiration processes. This value, currently equal to **1.02** (Cerling et al., 2016, Larsen et al., 2018), has been experimentally determined and is a fixed value at each point in time. By convention, the results of carbon isotope analysis are reported based on a 1950 NBS oxalic acid standard, and so Fm_{sample} is reported as if the analysis took place in 1950. Due to nuclear testing, current ^{14}C atmospheric levels are now higher than they were in 1950. This means that Fm_{atm} is counter-intuitively larger than 1, as the $^{14}C/^{12}C$ sample ratio is higher now than it would have been in 1950.

^{14}C Calculations:

Conversion of Fraction Modern Carbon to Fossil Fuel Carbon:

The equation for calculating the percentage of fossil fuel carbon (ff_{sample}) is derived from the following mass balance:

$$Fm_{sample} = (ff_{sample})(Fm_{ff}) + (1 - ff_{sample})(Fm_{atm})$$

Solving for ff_{sample} yields:

$$ff_{sample} = 1 - \frac{Fm_{sample}}{Fm_{atm}}$$

Fraction modern (Fm_{sample}, from ^{14}C analysis) is reported by convention based on ^{14}C levels from 1950. Because of atomic testing, current environmental ^{14}C levels are approximately 2% higher than they were in 1950 (Cerling et al., 2016, Larsen et al., 2018) and Fm_{atm} is equal to 1.02. This equation then becomes:

$$ff_{sample} = 1 - \frac{Fm_{sample}}{1.02}$$

As percentages must add to 1, the percentage of bio-based carbon ($bb_{sample.}$) can then be calculated using the following equivalence:

$$bb_{sample} = 1 - ff_{sample} = 1 - \left(1 - \frac{Fm_{sample}}{1.02}\right) = \frac{Fm_{sample}}{1.02}$$

Converting Carbon Flux to Equivalent LNAPL Loss Rate:

The intermediate reactions for LNAPL mineralization include methanogenesis, leading to production of methane and CO_2, and the subsequent aerobic oxidation of methane into CO_2:

$$C_8H_{18} + 3.5\ H_2O \rightarrow 6.25\ CH_4 + 1.75\ CO_2 \text{ (methanogenesis)}$$

$$6.25\ CH_4 + 12.5\ O_2 \rightarrow 6.25\ CO_2 + 12.5\ H_2O \text{ (methane oxidation)}$$

$$C_8H_{18} + 12.5\ O_2 \rightarrow 9H_2O + 8\ CO_2 \text{ (overall reaction)}$$

Assuming a conservative LNAPL density of 0.77 g mL^{-1} (upper range of gasoline) and using the molecular weight of C_8H_{18} (octane, 114.23 g mol^{-1}), µmol m^{-2} s^{-1} of CO_2 can then be converted into gal. $acre^{-1}$ yr^{-1} of LNAPL:

$$1\ \frac{\mu mol\ CO_2}{m^2\ s} \cdot \left(\frac{1\ \mu mol\ C_8H_{18}}{8\ \mu mol\ CO_2}\right)\left(\frac{1\ mol\ C_8H_{18}}{1 \times 10^6\ \mu mol\ C_8H_{18}}\right)\left(\frac{114\ g\ C_8H_{18}}{1\ mol\ C_8H_{18}}\right)\left(\frac{1\ mL\ C_8H_{18}}{0.77\ g\ C_8H_{18}}\right)$$
$$\left(\frac{1\ L}{1000 mL}\right)\left(\frac{1\ gal.}{3.785\ L}\right)\left(\frac{4{,}046\ m^2}{1\ acre}\right)\left(\frac{3600\ s}{1\ h}\right)\left(\frac{24\ h}{1\ d}\right)\left(\frac{365\ d}{1\ yr}\right) \cdot$$

$$= 625.2\ \frac{gal.\ C_8H_{18}}{acre \cdot yr}$$

Note that both the LNAPL formula and its density are assumed, and so this conversion is subject to uncertainty. However, site-specific data can be used if available. Using alternative representative hydrocarbon formulas and densities generally results in conversion factors that are within 10-15% of 625.2 gal. $acre^{-1}$ yr^{-1}. Therefore, the uncertainty associated with these values does not preclude an acceptable estimate.

Expected Results and Recommendations:

^{14}C-based techniques offer a built-in, location-specific correction as an alternative to the standard background location correction. Early work on a limited number of samples suggested that ^{14}C-corrected results are equivalent to background-corrected results (Sihota and Mayer, 2012; McCoy et al., 2015). However, a more recent comparison spanning 4 different sites suggests that measured carbon fluxes can differ by up to five times among different locations within the same site (Zimbron and Kasyon, 2015). Depending on the location, the resulting difference between background-corrected and ^{14}C-corrected NSZD rate estimates can be up to one order of magnitude. In contrast, the background correction assumes that the non-fossil fuel CO_2 flux is constant across an entire site; large errors in final estimated NSZD rates might therefore be introduced if the background correction is used. Because the ^{14}C measurement is co-located with the CO_2 flux measurement, it is unbiased by spatial uncertainties related to the background location(s) (e.g., vegetation, lithology, unknown impacts, different gas transport regimes, soil moisture).

The fossil fuel CO_2 content of unexposed sorbent as used in the traps is typically around 30% (as of today) and likely results from material processing and handling (e.g., exposure to fossil fuel fumes). This small mass of fossil fuel CO_2 is removed from samples by carrying out a ^{14}C travel blank correction. ^{14}C analysis is performed on CO_2 sorbent sub-samples after homogenization of the entire bottom sorbent layer (see McCoy et al., 2015). The mass of fossil fuel CO_2 in the unexposed travel blank trap (TB) is then subtracted from the mass of fossil fuel CO_2 in each field-deployed trap.

The results in this report are based on proprietary technology used to measure soil gas efflux. All information contained herein is strictly confidential to the customer.

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Project: Philadelphia, PA
Customer: Stantec Consulting Services, Inc.
Customer Contact: Andrew Klingbeil
Report Date: 7-Feb-2024

Sample ID	Sampling Information			Raw Results[a]				Final CO_2 Results[b]			^{14}C Results[a]			NSZD Results[b]				
	Deployed	Retrieved	Days in Field	Moisture content (%)	Dry Sorbent Mass (g)	Avg. % CO_2[c]	CV[d] CO_2 (%)	CO_2 content (%)	CO_2 mass (g)	CO_2 Flux (µmol m^{-2} s^{-1})	Fm_{sample} As Reported[e]	bb_{sample} As of Today[f]	ff_{sample} As of Today[f]	Bio-based CO_2 Flux (µmol m^{-2} s^{-1})	ff_{sample} As of Today (TB-corrected)	Fossil Fuel CO_2 (g)	Fossil Fuel CO_2 Flux (µmol m^{-2} s^{-1})	Equivalent NSZD Rate (gal. $acre^{-1}$ yr^{-1})
10193-R3-CO2-TB	N/A	N/A	N/A	18.1%	42.06	1.14%	2.43%	-	-	-	67.10	65.78%	34.22%	-	-	-	-	-
10193-R3-CO2-01	10/16/23 10:45	10/20/23 11:08	4.0	18.8%	42.09	1.57%	2.63%	0.43%	0.18	1.47	75.88	74.39%	25.61%	1.43	ND	ND	ND	ND
10193-R3-CO2-02	10/16/23 11:05	10/20/23 11:01	4.0	18.5%	41.81	1.69%	2.04%	0.55%	0.23	1.88	74.82	73.36%	26.64%	1.67	11.12%	0.03	0.21	131
10193-R3-CO2-03	11/14/23 12:00	11/20/23 12:37	6.0	12.6%	42.26	2.32%	2.08%	1.18%	0.50	2.69	78.97	77.42%	22.58%	2.39	11.40%	0.06	0.31	192
10193-R3-CO2-04	11/14/23 12:30	11/20/23 12:20	6.0	16.1%	42.35	1.92%	0.73%	0.79%	0.33	1.80	76.27	74.77%	25.23%	1.58	12.23%	0.04	0.22	138
10193-R3-CO2-05	11/14/23 13:15	11/20/23 12:43	6.0	18.1%	42.19	2.16%	1.02%	1.02%	0.43	2.33	80.91	79.33%	20.67%	2.20	5.56%	0.02	0.13	81

- The flux equivalence is **1** µmol m^{-2} s^{-1} = **625.2** gallons $acre^{-1}$ yr^{-1}, assuming a representative hydrocarbon density of **0.77** g mL^{-1} with the formula $\mathbf{C_8H_{18}}$.Trap cross-sectional area is **8.11×10^{-3}** m^2 (based on a **4-inch** receiver pipe).
- Carbonate analysis of each trap/sample is based on method ASTM 4373-14, which does not provide acceptable variability (CV) standards. Similar methods (e.g., ASTM D513-16) allow typical errors of ≤ 20%. Analysis is therefore conducted in duplicate if the coefficient of variation (CV) of the duplicates is < 5%. If CV ≥ 5%, duplicate analyses are repeated until CV < 5%.
- NA = Not Applicable; ND = Not Detectable. Based on the project capture area, sorbent mass and deployment time, and the variability of the total carbon and fossil fuel carbon analysis, the limit of detection for the NSZD rate is **51** gallons $acre^{-1}$ yr^{-1}.

a. Raw and ^{14}C Results are not TB-corrected.
b. Final CO_2 and NSZD Results are TB-corrected.
c. Refers to the measured weight percentage of CO_2 with respect to the total dry sorbent mass.
d. Refers to the coefficient of variation of CO_2 measurements for each sample: CV = [standard deviation of %CO_2 measurements] / [average %CO_2 measurement]
e. Refers to the reported fraction modern (Fm_{sample}). As is standard in radiocarbon reporting, this value has not been corrected to account for present-day ^{14}C atmospheric levels. This number is originally reported as pMC (percent modern carbon) and is converted into *Fm* for our calculations using the relation 100.0 pMC = 1.0 *Fm* = 100% *Fm*.
f. "As of Today," means that the value has been adjusted to account for the difference between atmospheric ^{14}C levels from the 1950s and today (Stenström et al., 2011). bb_{sample} is the percentage of the total CO_2 that is derived from bio-based (non-fossil fuel) sources. ff_{sample} refers to the percentage of CO_2 that is derived from fossil fuels. The values reported in the NSZD Results section are TB-corrected, but those in the ^{14}C Results section are not TB-corrected.

Results Snapshot:

- The Travel Blank (TB) concentration is **1.14%**; typically, this number is < 2%.
- Trap tops are not saturated with CO_2 (sorbent saturation is 30%). The maximum measured (raw) top concentration is **3.08%** (sample **10193-R3-CO2-03-top**).
- Bio-based carbon fluxes represent the CO_2 contributions from natural soil respiration processes to the total carbon flux; the ^{14}C analysis corrects for this contribution. Average bio-based CO_2 flux is **1.85** µmol m^{-2} s^{-1}, and the coefficient of variation is **22%.** The range of bio-based CO_2 fluxes is between **1.43** and **2.39** µmol m^{-2} s^{-1}. If these interferences were not removed using the results of the radiocarbon analysis, the errors in the NSZD rate estimates would be between **883**- and **1,492**-gallons $acre^{-1}$ yr^{-1}.
- Sample **10193-R3-CO2-01** shows non-detectable (ND) fossil fuel CO_2 flux. The entire CO_2 flux for this sample is likely derived from non-fossil fuel sources.

Site-specific Sample Calculations:

Grams of Fossil Fuel CO_2:

The mass of fossil fuel-derived CO_2 in each trap is calculated by subtracting the total fossil fuel CO_2 in the travel blank (TB) from the total fossil fuel CO_2 in the trap. Only data that are ***not*** TB-corrected (i.e., ff_{sample} As of Today and raw % CO_2) are used in this calculation. Using sample **10193-R3-CO2-02** as an example:

$$\left(g\ CO_{2(ff)}\right)_{sample\ 2} = g_{sorbent} \cdot \left[\left((\%\ CO_2)_{sample}\left(ff_{sample}\right)\right) - \left((\%\ CO_2)_{TB}\left(ff_{TB}\right)\right)\right]$$

$$\left(g\ CO_{2(ff)}\right)_{sample\ 2} = \mathbf{41.81}\ g \cdot \left[(\mathbf{1.69}\ \% \cdot \mathbf{26.64}\ \%) - (\mathbf{1.14}\ \% \cdot \mathbf{34.22}\ \%)\right]$$

$$\left(g\ CO_{2(ff)}\right)_{sample\ 2} = \mathbf{0.0258}\ g$$

Here, $g_{sorbent}$ is the mass of sorbent used in the bottom layer of the trap, $(\%CO_2)_{sample}$ is the average weight percentage of CO_2 in the sample, ff_{sample} is the percentage of carbon in the sample derived from fossil fuels, $(\%CO_2)_{TB}$ is the average weight percentage of CO_2 in the travel blank, and ff_{TB} is the percentage of carbon in the travel blank that is derived from fossil fuels. In this example, sample **10193-R3-CO2-02** contains **0.0258 g** of fossil-fuel derived CO_2.

Fossil Fuel CO_2 Flux:

Converting grams of CO_2 to CO_2 flux requires the cross-sectional area of the receiver (**8.11×10^{-3}** m^2 for a **4**-inch receiver), the number of days that the trap was deployed in the field, and the molecular weight of CO_2 (44 g mol^{-1}). Using trap **10193-R3-CO2-02** as an example:

$$Fossil\ Fuel\ CO_2\ Flux = \frac{g\ fossil\ fuel\ CO_2 \cdot \frac{1\ mol\ CO_2}{44\ g\ CO_2} \cdot \frac{1{,}000{,}000\ \mu mol\ CO_2}{1\ mol\ CO_2}}{days\ in\ the\ field \cdot \frac{24\ hr}{day} \cdot \frac{3600\ s}{hr} \cdot (receiver\ area)}$$

$$Fossil\ Fuel\ CO_2\ Flux = \frac{\mathbf{0.0258}\ g\ fossil\ fuel\ CO_2 \cdot \frac{1\ mol\ CO_2}{44\ g\ CO_2} \cdot \frac{1{,}000{,}000\ \mu mol\ CO_2}{mol\ CO_2}}{\mathbf{4}\ days \cdot \frac{24\ hr}{day} \cdot \frac{3600\ s}{hr} \cdot (\mathbf{8.11 \times 10^{-3}}\ m^2)}$$

$$Fossil\ Fuel\ CO_2\ Flux = \mathbf{0.21}\ \frac{\mu mol\ CO_2}{m^2 \cdot s}$$

References

ASTM (2014) Method D4373-14, Rapid Determination of Carbonate Content of Soils.

ASTM (2016) Method D513-16, Total and Dissolved Carbon Dioxide in Water.

ASTM (2018) Method D6866-18, Determining the Biobased Content in Solids, Liquid, and Gaseous Samples Using Radiocarbon Analysis.

Avery, Jr. G. B., Wiley J. D. and Kieber R. J. (2006) Carbon isotopic characterization of dissolved organic carbon in rainwater: Terrestrial and marine influences. *Atmospheric Environment* **40(39)**, 7539-7545.

Cerling T. E., Barnette J. E., Chesson L. A., Douglas-Hamilton I., Gobush K. S., Uno K. T., Wasser S. K. and Xu X. (2016) Radiocarbon dating of seized ivory confirms rapid decline in African elephant populations and provides insight into illegal trade. *Proceedings of the Natural Academy of Sciences* **114(47)**, 13330-13335.

Klouda G. A. and Connolly M. V. (1995) Radiocarbon (^{14}C) measurements to quantify sources of atmospheric carbon monoxide in urban air. *Atmospheric Environment* **29(22)**, 3309-3318.

Larsen T., Yokoyama Y. and Fernandes R. (2018) Radiocarbon in ecology: Insights and perspectives from aquatic and terrestrial studies. *Methods in Ecology and Evolution* **9**, 181-190.

Levin I., Graul R. and Trivett N. B. A. (1995) Long-term observations of atmospheric CO_2 and carbon isotopes at continental sites in Germany. *Tellus B, Chemical and Physical Meteorology* **47**, 23-34.

McCoy K., Zimbron J., Sale T. and Lyverse M. (2015) Measurement of Natural Losses of LNAPL Using CO_2 Traps. *Groundwater* **53(4)**, 658-667. doi:10.1111/gwat.12240

Sihota N. J. and Mayer K. U. (2012) Characterizing vadose zone hydrocarbon biodegradation using carbon dioxide effluxes, isotopes, and reactive transport modeling. *Vadose Zone Journal* **11(4)**, doi:10.2136/vzj2011.0204

Stenström K. E., Skog G., Georgiadou E., Genberg J. and Johansson A. (2011) A guide to radiocarbon units and calculations. Lund University Internal Report, LUNFD6(NFFR-3111)/1-17/(2011).

Stuiver M. and Polach H. A. (1977) Discussion: Reporting of ^{14}C data. *Radiocarbon* **19(3)**, 355–363.

Zimbron J. and Kasyon E. (2015) Combined Use of Isotope Analysis and Passive CO_2 Flux Traps to Estimate Field Rates of Hydrocarbon Degradation. Battelle Remediation Conference, D-002(abstr.), Miami FL.

Appendix S Microbac Labs Genomic Sequencing Reports

Genomic Sequencing Report

Microbac Oak Ridge WO# Z3FG0106-02 **9/7/2023**

Client: Andrew Klingbell

Sample Project: PERSOM UDEX Release, Former PHL Refineries 2134030309

Sample ID: S-508-20230720

Sample Collected: 7/20/2023

qPCR Overview: Estimated Bacterial Biomass 4.13e8 gc/L

NCBI Taxonomy Browser to look up "Taxonomy Id"
https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi add number in "Search for" in upper left box.

Summary:

- There were 7.104 reads for this sample and the file size was 1.47 GB.
- There were 301 identifications (ID's) in the bacterial data set.
- There was 1 identification in the virus data set.
- There were 7 identifications in the protists data set.
- There were 18 identifications in the fungal data set.
- There were 82 identifications in the Combined Kingdom data set.
- There were 7 identifications in the Antimicrobial Resistance data set.
- There were 80 identifications in the Virulence Factors data set.
- There were 15 identifications in the phages data set.
- There were 159 identifications in the Dark Matter (Beta) data set.

The Oak Ridge Microbac laboratory uses the CosmosID bioinformatics pipeline and cloud computing platform for analysis and report generation. The report consists of tables and figures for bacteria, antibiotic resistance genes, fungi, protists, phages, viruses, secondary bacterial (Dark Matter) and virulence genes.

Report Definitions

- **Name:** The name for the organism or taxonomic level or the name of the antibiotic resistance gene or virulence factor.
- **Calls at different taxonomic levels:** In the results there may be some calls at sub-species or strain level and others at species or genus level or higher. CosmosID calls the lowest level

possible based on the identification of unique kmers that match the reference genomes. If identification was not possible at strain level, for example, there will be a try to make an identification at species level etc.

- **Tax ID:** The tax id is the NCBI taxonomic id for the organism.
- **Frequency:** The number of unique kmer occurrences in the queried sample. This is roughly equivalent to the number of reads that matched to the organism identified.
- **Unique Matches:** Unique matches percent is the amount of unique kmers that were found in the sample for an organism out of the total possible number of kmers in the database that are unique to that organism.
- **Total Matches:** The shared plus unique matches divided by the pre-calculated shared plus unique matches possible in the reference database.
- **Relative Abundance:** Relative abundance is calculated based on the number of organism specific kmers and their observed frequency in the sample and then normalized to represent the abundance of each organism.

The following are the methods used for sample processing and analysis for this project:

DNA Extraction :

DNA samples were quantified using Qubit 4 fluorometer and Qubit™ dsDNA HS Assay Kit (Thermofisher Scientific).

Library Preparation and Sequencing:

DNA libraries were prepared using the Nextera XT DNA Library Preparation Kit (Illumina) and IDT Unique Dual Indexes with total DNA input of 1ng. Genomic DNA was fragmented using a proportional amount of Illumina Nextera XT fragmentation enzyme. Unique dual indexes were added to each sample followed by 12 cycles of PCR to construct libraries. DNA libraries were purified using AMpure magnetic Beads (Beckman Coulter) and eluted in QIAGEN EB buffer. DNA libraries were quantified using Qubit 4 fluorometer and Qubit™ dsDNA HS Assay Kit. Libraries were then sequenced on an Illumina NextSeq 2000 platform 2x150bp

Bioinformatics Analysis:

Unassembled sequencing reads were directly analyzed by CosmosID-HUB Microbiome Platform (CosmosID Inc., Germantown, MD) described elsewhere (Ottensen et al., 2016, Ponnusamy et al., 2016, Hasan et al., 2014, Lax et al., 2014) for multi-kingdom microbiome analysis and profiling of antibiotic resistance and virulence genes and quantification of organisms' relative abundance. Briefly, the system utilizes curated genome databases and a high performance data-mining algorithm that rapidly disambiguates hundreds of millions of metagenomic sequence reads into the discrete microorganisms engendering the particular sequences. Similarly, the community resistome and virulome, the collection of antibiotic resistance and virulence associated genes in the microbiome, were also identified by querying the unassembled sequence reads against the CosmosID curated antibiotic resistance and virulence associated gene databases.

Fasta/q details

Name	Value
Hit	1086943

Table

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Comamonas sp. CAH-2	2605745	17997.56	15.50%	60.96	75.67	138575
Geobacter uraniireducens Rf4	351605	11664.93	10.05%	42.67	42.67	366954
Comamonas aquatica DA1877	1457173	10283.99	8.86%	10.51	48.31	18737
Acidovorax temperans	80878	8652.95	7.45%	42.62	42.72	211384
Malikia spinosa	86180	6507.98	5.61%	35.25	37.79	107301
Sulfurospirillum sp. UCH001	1581011	5161.55	4.45%	37.42	37.49	41932
Acidovorax sp. NO-1	512030	3571.65	3.08%	27.85	28.06	57533
Sediminibacterium salmoneum NBRC 103935	1400522	3031.52	2.61%	27.71	28.18	13204
Azospira oryzae PS	640081	2983.47	2.57%	13.99	25.60	8653
Azospira sp. I09	1765049	2894.93	2.49%	12.40	25.06	6959
Brevundimonas sp. Bb-A	2560058	2639.07	2.27%	11.54	22.48	7026
Malikia granosa	263067	2205.52	1.90%	12.81	17.83	20929
Pseudomonas alcaliphila JAB1	741155	2109.54	1.82%	10.24	18.40	6605
Pseudomonas sp. ALS1279	1734450	2088.59	1.80%	11.41	18.21	7053
Rhizobium sp. MSSRF QS100	1522278	1697.68	1.46%	8.92	15.53	6912
Pseudomonas xanthomarina	271420	1650.39	1.42%	3.55	15.42	1329
Pseudomonas alcaligenes NBRC 14159	1215092	1633.43	1.41%	8.30	14.94	6885
Algoriphagus aquaeductus	475299	1584.73	1.37%	15.53	15.53	12246
Pseudomonas chloritidismutans AW-1	1263865	1537.02	1.32%	2.98	14.44	1342
Dechloromonas hortensis	337779	1465.65	1.26%	13.35	13.49	21392
Aquabacterium olei	1296669	1431.92	1.23%	12.44	12.80	23451
Pseudomonas stutzeri CCUG 29243	1196835	1408.26	1.21%	2.53	13.55	1097
Limnohabitans sp. Hippo3	1597956	1267.26	1.09%	11.99	12.33	11599
Pseudomonas chengduensis	489632	1059.51	0.91%	2.99	10.25	1029
Methyloversatilis discipulorum	1119528	1024.8	0.88%	8.24	9.53	14390

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Hydrogenophaga sp. IBVHS2	1985170	955.98	0.82%	9.55	9.55	10458
Pseudomonas aeruginosa	287	916.11	0.79%	21.05	21.05	56
Pseudomonas toyotomiensis	554344	894.65	0.77%	1.68	8.72	642
Alishewanella sp. HH-ZS	1856684	738.02	0.64%	4.79	7.68	1749
Acidovorax defluvii	86669	680.9	0.59%	3.15	6.36	3587
Pseudomonas indoloxydans	404407	583.05	0.50%	2.52	5.70	1517
Alishewanella aestuarii B11	1197174	576.02	0.50%	2.44	6.18	834
Acidovorax soli	592050	572.65	0.49%	4.53	5.03	8091
Alishewanella jeotgali KCTC 22429	1129374	562.65	0.49%	2.17	5.99	1021
Sediminibacterium sp. C3	1267211	540.49	0.47%	2.40	6.08	1102
Brevundimonas fluminis	2487274	538.09	0.46%	5.64	5.64	7647
Rheinheimera tangshanensis	400153	433.12	0.37%	3.83	4.86	1758
Acinetobacter lwoffii WJ10621	1046625	394.65	0.34%	2.96	4.95	534
Acinetobacter sp. CIP 51.11	1144670	379.13	0.33%	2.20	5.29	256
Acetobacterium dehalogenans DSM 11527	1068975	373.46	0.32%	3.66	3.92	3710
Agrobacterium sp. RAC06	1842536	355.86	0.31%	1.31	3.77	514
Aquabacterium parvum	70584	349.81	0.30%	1.53	2.28	8174
Simplicispira lacusdiani	2213010	331.74	0.29%	2.87	3.19	5703
Acinetobacter idrijaensis	1507807	302.74	0.26%	1.24	4.20	155
Geobacter	28231	297.23	0.26%	4.49	4.41	78
Desulforegula conservatrix Mb1Pa	1304885	286.44	0.25%	3.33	3.33	2694
Acinetobacter johnsonii SH046	575586	277.96	0.24%	1.46	3.60	252
Aromatoleum tolulyticum	34027	270.5	0.23%	2.67	2.90	4745
Flavobacterium sasangense DSM 21067	1121896	260.89	0.22%	2.85	3.13	1738
Alishewanella agri BL06	1195246	250.36	0.22%	1.09	3.00	366
Dechloromonas sp. CZR5	2608630	240.74	0.21%	2.38	2.63	4068
Geobacter lovleyi SZ	398767	232.63	0.20%	1.56	1.89	4354
Dechloromonas aromatica RCB	159087	181.92	0.16%	1.95	2.05	3315
Limnohabitans curvus	323423	180.28	0.16%	1.54	2.18	549
Dechloromonas agitata is5	1304883	168.67	0.15%	1.74	1.94	2476
Mycolicibacterium doricum	126673	152.09	0.13%	1.67	1.76	2961
Streptococcus thermophilus	1308	128.61	0.11%	0.54	0.71	5

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Pseudomonas peli	592361	123.85	0.11%	1.15	1.37	2022
Microbacterium chocolatum	84292	118.25	0.10%	1.43	1.43	2421
Geobacter thiogenes	115783	100.55	0.09%	1.00	1.40	2016
Comamonas thiooxydans	363952	91.17	0.08%	0.18	0.18	51
Aquabacterium commune	70586	91.8	0.08%	0.87	1.52	3104
Comamonas granuli NBRC 101663	1223521	89.66	0.08%	0.97	1.27	2078
Pararheinheimera mesophila	1547515	86.03	0.07%	1.07	1.19	817
Diaphorobacter sp. J5-51	680496	85.03	0.07%	0.84	0.53	995
Comamonadaceae bacterium 2PF	2502197	80.24	0.07%	0.80	1.38	2521
Aquabacterium sp. NJ1	1538295	74.11	0.06%	0.67	0.69	3063
Acinetobacter	469	72.42	0.06%	1.27	1.45	137
Serpentinomonas mccroryi	1458426	67.43	0.06%	0.96	1.02	717
Acidovorax ebreus TPSY	535289	66.55	0.06%	0.92	0.62	600
beta proteobacterium L13	1229489	63.48	0.06%	0.87	1.24	947
Pseudomonas songnenensis	1176259	63.85	0.06%	0.88	2.29	873
Blastomonas sp. CCH6-A6	1768735	63.66	0.06%	1.47	0.94	11
Burkholderiales bacterium C2	2502236	62.06	0.05%	0.77	0.77	1545
Lysobacter sp. N42	2545719	60.34	0.05%	0.75	0.47	1328
Brevundimonas bacteroides DSM 4726	1121124	59.59	0.05%	0.78	0.99	1170
Agrococcus sp. NS18	2599924	59.09	0.05%	0.78	0.81	1174
Limnobacter sp. SAORIC-690	1923970	58.33	0.05%	0.83	0.92	706
Dehalococcoides	61434	57.66	0.05%	2.56	2.56	6
Xanthomonadaceae bacterium 2PA	2502194	57.02	0.05%	1.39	0.80	4
Acidovorax kalamii	2004485	56.11	0.05%	0.67	1.07	1305
Acinetobacter junii NIPH 182	1217665	52.68	0.05%	0.95	4.07	181
Silanimonas lenta DSM 16282	1123253	50.84	0.04%	0.70	0.70	702
Alicycliphilus sp. B1	1603291	50.12	0.04%	0.74	0.42	472
alpha proteobacterium L41A	1229204	50.17	0.04%	0.72	1.67	644
Rheinheimera sp. KL1	1635005	48.17	0.04%	0.77	3.18	362
Caulobacter sp. CCH5-E12	1768770	46.3	0.04%	0.88	1.16	139
Acidovorax delafieldii 2AN	573060	45.16	0.04%	0.55	0.56	1337
Bosea sp. RAC05	1842539	44.82	0.04%	0.61	0.66	992
Cupriavidus sp. HMR-1	1249621	41.28	0.04%	0.54	0.41	460

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beta proteobacterium CB	543913	41.68	0.04%	0.69	0.69	286
Tsuneonella troitsensis	292222	40.15	0.03%	0.58	0.60	701
Flavobacterium sp. LMO8	2654244	40.21	0.03%	0.66	1.08	292
Polynucleobacter yangtzensis	1743159	39.8	0.03%	0.66	0.66	287
Geobacter metallireducens	28232	37.05	0.03%	0.48	0.50	882
Pelobacter propionicus DSM 2379	338966	37.48	0.03%	0.37	0.37	1345
Rhodoferax bucti	2576305	36.01	0.03%	0.42	0.42	983
Arenimonas malthae CC-JY-1	1384054	34.92	0.03%	0.51	0.57	597
Phenylobacterium sp. CCH9-H3	1768774	33.56	0.03%	0.85	0.49	41
Hirschia	2723	33.36	0.03%	1.04	1.04	12
Azonexus fungiphilus	146940	32.03	0.03%	0.46	0.54	665
Lysobacter tabacisoli	2315424	31.97	0.03%	0.45	0.45	732
Acetobacterium wieringae	52694	32.85	0.03%	0.43	0.76	544
Massilia alkalitolerans DSM 17462	1111733	30.93	0.03%	0.44	0.62	723
Streptomyces coelicoflavus ZG0656	1120227	30.97	0.03%	0.45	0.87	543
Alicycliphilus denitrificans K601	596154	29.38	0.03%	0.50	0.32	203
Azonexus hydrophilus DSM 23864	1121032	28.48	0.03%	0.41	0.48	567
Microcella alkaliphila	279828	29.56	0.03%	0.43	0.44	654
Vogesella sp. EB	1526735	27.38	0.02%	0.45	0.81	304
Brevundimonas intermedia	74315	28.11	0.02%	0.41	0.86	570
Erythrobacter colymbi	1161202	27.88	0.02%	0.40	0.65	602
Flavobacterium alvei	2080416	28.01	0.02%	0.46	0.45	294
Limnohabitans parvus II-B4	1293052	26.85	0.02%	0.42	0.51	381
Ideonella sp. KYPY4	1862385	26.59	0.02%	0.36	0.36	791
Pseudomonas anguilliseptica	53406	27.18	0.02%	0.37	0.60	680
Brevundimonas subvibrioides ATCC 15264	633149	26.78	0.02%	0.39	0.42	608
Ornithinimicrobium flavum	1288636	26.95	0.02%	0.39	0.41	689
Vogesella indigofera	45465	25.62	0.02%	0.42	0.78	315
Desulfomicrobium baculatum DSM 4028	525897	25.23	0.02%	0.38	0.41	538
Geobacter sp. OR-1	1266765	24.03	0.02%	0.25	0.25	866

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Pseudomonas sediminis	1691904	24.89	0.02%	0.37	0.51	406
Brevundimonas nasdae	172043	24.37	0.02%	0.39	1.16	348
Caulobacter vibrioides	155892	24.48	0.02%	0.36	0.36	581
Novosphingobium sp. CCH12-A3	1768752	24.9	0.02%	0.21	0.40	873
Lacibacter cauensis	510947	24.07	0.02%	0.37	0.42	430
Delftia sp. K82	1472718	22.64	0.02%	0.26	0.64	414
Macromonas sp. BK-30	1843082	22.77	0.02%	0.32	0.32	524
Simplicispira metamorpha	80881	22.81	0.02%	0.30	0.36	629
Paucibacter aquatile	2070761	23.37	0.02%	0.32	0.32	683
Polynucleobacter cosmopolitanus	351345	22.76	0.02%	0.43	0.43	146
Exiguobacterium sp. AB2	1484479	22.92	0.02%	0.40	0.60	229
Pseudoxanthomonas sp. Root65	1736576	22.42	0.02%	0.34	0.37	528
Thermomonas fusca DSM 15424	1123377	22.21	0.02%	0.32	0.37	492
Paracoccus endophyticus	2233774	21.89	0.02%	0.33	0.34	453
Vogesella mureinivorans	657276	20.96	0.02%	0.33	0.69	389
Lysobacter enzymogenes	69	21.4	0.02%	0.32	0.34	561
Sphingopyxis sp. EG6	1874061	21.46	0.02%	0.36	0.63	257
Macromonas bipunctata	183670	19.81	0.02%	0.20	0.21	701
Arenimonas metalli CF5-1	1384056	19.85	0.02%	0.31	0.40	378
Kocuria	57493	18.9	0.02%	0.60	0.60	11
Propionibacterium sp. HMSC065F07	1739345	18.13	0.02%	0.82	1.64	8
Aromatoleum toluclasticum ATCC 700605	1261621	17.15	0.02%	0.27	0.63	434
Pseudomonas	286	17.6	0.02%	0.11	0.11	8
Lysobacter segetis	2492394	16.95	0.02%	0.25	0.30	462
Skermanella aerolata KACC 11604	1385368	16.99	0.02%	0.26	0.26	463
Agrobacterium albertimagni AOL15	1156935	17.92	0.02%	0.27	0.66	472
Ornithinimicrobium sp. DSM 17687	2590013	17.69	0.02%	0.29	0.45	270
Rubrivivax	28067	16.04	0.01%	0.20	0.20	76
Aquabacterium pictum	2315236	15.74	0.01%	0.24	0.24	451

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Desulfovibrio putealis DSM 16056	1121462	16.13	0.01%	0.24	0.24	459
Arenimonas donghaensis DSM 18148 = HO3-R19	1121014	15.79	0.01%	0.25	0.27	323
Novosphingobium subterraneum	48936	16.36	0.01%	0.30	0.62	176
Erythrobacter donghaensis	267135	16.49	0.01%	0.27	0.35	292
Neomicrococcus aestuarii	556325	16.6	0.01%	0.27	0.27	342
Actinotalea ferrariae CF5-4	948458	16.04	0.01%	0.25	0.26	413
Melaminivora alkalimesophila	1165852	14.96	0.01%	0.20	0.21	408
Noviherbaspirillum sp. UKPF54	2601898	15.32	0.01%	0.24	0.30	416
Zoogloea ramigera	350	14.68	0.01%	0.22	0.24	424
Rhodobacter sp. CACIA14H1	1408890	14.58	0.01%	0.24	0.26	322
Methylorubrum populi BJ001	441620	15.42	0.01%	0.21	0.24	558
Microcella putealis	337005	14.67	0.01%	0.24	0.25	338
Candidatus Cryosericum hinesii	2290915	14.71	0.01%	0.26	0.26	217
Flavobacteria bacterium BAL38	391598	15.59	0.01%	0.33	0.52	83
Verminephrobacter	364316	14.06	0.01%	0.74	0.74	2
Simplicispira hankyongi	2315688	13.98	0.01%	0.20	0.23	443
Rhodoferax sp. TS-BS-61-7	2094194	14.06	0.01%	0.20	0.23	433
Pelomonas saccharophila	304	14.25	0.01%	0.20	0.28	495
Aquincola tertiaricarbonis	391953	14.41	0.01%	0.22	0.22	434
Azoarcus sp. CIB	198107	13.73	0.01%	0.22	0.75	373
Vogesella perlucida	450366	14.38	0.01%	0.24	0.63	261
Micrococcus luteus str. modasa	1232675	13.56	0.01%	0.23	0.23	241
Geothrix fermentans DSM 14018	1121920	13.92	0.01%	0.23	0.23	265
Curvibacter lanceolatus ATCC 14669	1265504	12.35	0.01%	0.19	0.26	367
Pelomonas puraquae	431059	13.15	0.01%	0.19	0.24	449
Extensimonas perlucida	2590786	12.94	0.01%	0.19	0.19	364
Herbaspirillum sp. CAH-3	2605746	13.02	0.01%	0.21	0.23	324
Methyloversatilis universalis	378211	12.75	0.01%	0.20	0.36	344
Vogesella urethralis	2592656	13.34	0.01%	0.22	0.35	315

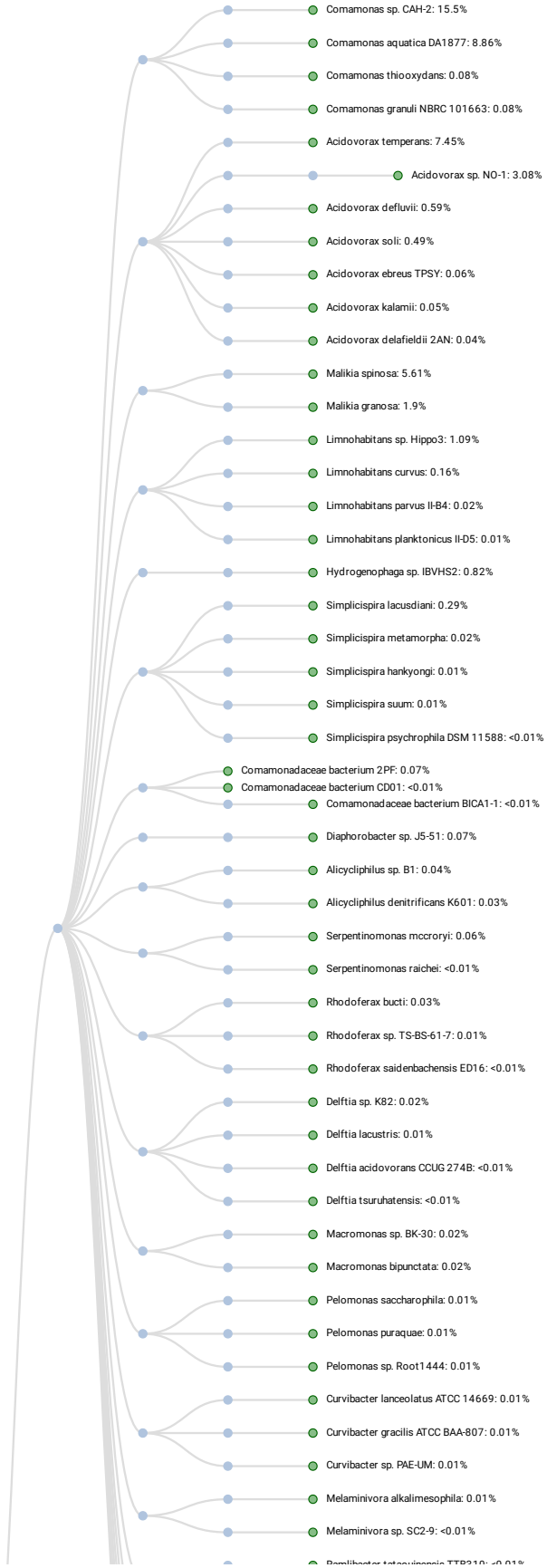
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Pararheinheimera texasensis DSM 17496	1123055	12.57	0.01%	0.21	0.21	253
Arenimonas caeni	2058085	12.68	0.01%	0.22	0.30	241
Brevundimonas bullata	13160	12.59	0.01%	0.20	0.29	313
Lactobacillus collinoides DSM 20515 = JCM 1123	1423733	12.42	0.01%	0.19	0.19	334
Deinococcus sp. UR1	1704277	12.89	0.01%	0.22	0.36	251
Limnohabitans planktonicus II-D5	1293045	11.57	0.01%	0.19	0.27	288
Delftia lacustris	558537	11.13	0.01%	0.23	0.60	85
Curvibacter gracilis ATCC BAA-807	1336244	11.87	0.01%	0.17	0.26	385
Curvibacter sp. PAE-UM	1714344	11.55	0.01%	0.17	0.17	367
Simplicispira suum	2109915	12.15	0.01%	0.18	0.19	392
Pelomonas sp. Root1444	1736464	11.6	0.01%	0.18	0.27	358
Piscinibacter aquaticus	392597	11.12	0.01%	0.17	0.18	356
Azohydromonas aeria	2590212	11.03	0.01%	0.17	0.21	367
Massilia sp. LC238	1502852	11.97	0.01%	0.20	0.46	294
Sphingomonas mesophila	2303576	11.99	0.01%	0.21	0.21	201
Rhizobium rosettiformans W3	538378	11.69	0.01%	0.19	0.22	315
Rhodoluna lacicola	529884	11.68	0.01%	0.23	0.23	103
Serpentinomonas raichei	1458425	9.9	<0.01%	0.13	0.17	14
Pulveribacter suum	2116657	10.02	<0.01%	0.15	0.16	307
Rhodoferax saidenbachensis ED16	614083	10.65	<0.01%	0.16	0.17	334
unclassified Ralstonia	209769	9.93	<0.01%	11.26	11.26	47
Noviherbaspirillum autotrophicum	709839	10.55	<0.01%	0.17	0.24	311
Pseudomonas mendocina	300	9.91	<0.01%	0.19	0.21	112
Pseudomonas composti	658457	10.81	<0.01%	0.17	0.20	329
Sphingomonas astaxanthinifaciens DSM 22298	1123267	10.9	<0.01%	0.20	0.20	172
Rhizobiales bacterium CCH10-E5	1768797	10.97	<0.01%	0.19	0.35	206
Omnitrophica bacterium SCGC AAA011-L16	1047010	10.82	<0.01%	0.29	0.29	32
Delftia acidovorans CCUG 274B	883101	8.85	<0.01%	0.19	0.44	72

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Comamonadaceae bacterium CD01	2052576	8.9	<0.01%	0.12	0.16	359
Melaminivora sp. SC2-9	2109913	8.77	<0.01%	0.14	0.16	249
unclassified Methylibium	2633235	9.61	<0.01%	0.17	0.16	114
Zoogloea oleivorans	1552750	9.69	<0.01%	0.16	0.21	306
Pseudomonas fluvialis	1793966	9.12	<0.01%	0.21	0.15	65
Aeromonas sp. ASNIH2	1636607	9.37	<0.01%	0.26	0.17	365
Brevundimonas naejangsanensis	588932	8.87	<0.01%	0.16	0.18	183
Brevundimonas abyssalis TAR-001	1391729	9.16	<0.01%	0.16	0.16	212
Lactococcus lactis subsp. cremoris HP	1295827	9.66	<0.01%	0.46	0.47	10
Lactobacillus japonicus	29399	9.13	<0.01%	0.17	0.28	128
Lactobacillus helveticus	1587	8.87	<0.01%	0.34	0.34	7
Flavobacterium tibetense	2233533	9.52	<0.01%	0.20	0.23	93
Comamonadaceae bacterium BICA1-1	1531963	8.64	<0.01%	0.17	0.32	121
Simplicispira psychrophila DSM 11588	1123255	7.64	<0.01%	0.11	0.11	283
Paucibacter toxinivorans	270368	8.28	<0.01%	0.13	0.13	319
Paucibacter sp. KBW04	2153361	7.58	<0.01%	0.12	0.13	281
Rhodocyclaceae bacterium Paddy-1	1691980	8.18	<0.01%	0.17	0.16	84
Azovibrio restrictus DSM 23866	1121035	7.97	<0.01%	0.14	0.18	180
Desulfovibrionaceae	194924	8.52	<0.01%	0.18	0.32	28
Pseudomonas pharmacofabricae	1905276	7.68	<0.01%	0.18	0.14	61
Pseudomonas leptonychotis	2448482	7.96	<0.01%	0.13	0.18	228
Pseudomonas guguanensis	1198456	8.6	<0.01%	0.15	0.17	188
Thermomonas sp. SY21	2202149	7.93	<0.01%	0.15	0.15	164
Phenylobacterium zucineum HLK1	450851	7.74	<0.01%	0.11	0.13	356
Phenylobacterium hankyongense	1813876	7.68	<0.01%	0.11	0.11	336
Sphingomonas sp. CCH18-B1	1768744	8.11	<0.01%	0.34	0.67	9
Chakrabartia godavariana	2056873	8.24	<0.01%	0.17	0.28	103
Erythrobacter neustonensis	1112	7.89	<0.01%	0.14	0.14	165

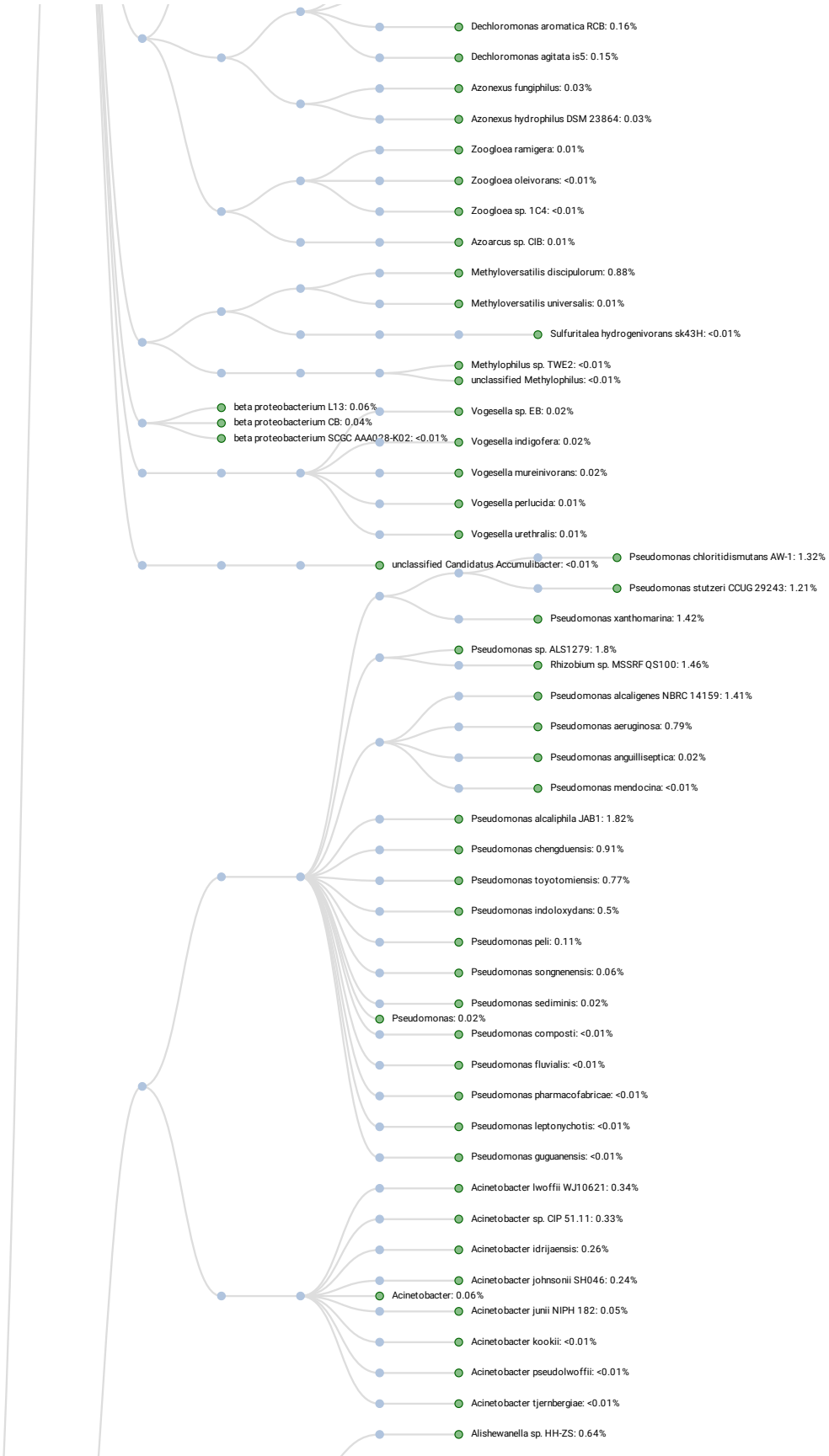
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Qipengyuania sediminis	1532023	8.11	<0.01%	0.14	0.14	161
Shinella sp. DD12	1410620	7.83	<0.01%	0.16	0.20	119
Nocardioides ganghwensis	252230	8.11	<0.01%	0.14	0.16	232
Xenophilus azovorans DSM 13620	1123504	7.17	<0.01%	0.11	0.14	273
Zhizhongheella caldifontis	1452508	7.23	<0.01%	0.11	0.13	246
Ramlibacter tataouinensis TTB310	365046	7.48	<0.01%	0.12	0.13	238
Ramlibacter rhizophilus	1781167	6.91	<0.01%	0.12	0.12	238
Sphaerotilus natans subsp. natans DSM 6575	1286631	6.91	<0.01%	0.11	0.11	276
Ralstonia mannitolilytica	105219	7.5	<0.01%	0.14	0.10	736
Polynucleobacter sinensis	1743157	7.28	<0.01%	0.16	0.16	72
Pseudoduganella danionis	1890295	7.2	<0.01%	0.13	0.13	218
Zoogloea sp. 1C4	2570190	7.13	<0.01%	0.12	0.13	249
beta proteobacterium SCGC AAA028-K02	938797	6.53	<0.01%	0.20	0.18	23
Sulfuritalea hydrogenivorans sk43H	1223802	6.91	<0.01%	0.12	0.12	199
Methylophilus sp. TWE2	1662285	6.77	<0.01%	0.14	0.14	89
Arenimonas terrae	2546226	6.62	<0.01%	0.12	0.16	167
Brevundimonas diminuta 470-4	1035191	6.4	<0.01%	0.12	0.21	141
Brevundimonas lutea	2293980	7.31	<0.01%	0.13	0.13	170
Caulobacter mirabilis	69666	6.72	<0.01%	0.11	0.11	242
Aestuariisphingobium litorale	2339262	6.83	<0.01%	0.14	0.25	97
Blastomonas fulva	1550728	7.17	<0.01%	0.16	0.26	71
Sphingopyxis bauzanensis	651663	6.59	<0.01%	0.11	0.14	195
Porphyrobacter sp. AAP82	1248917	7.04	<0.01%	0.14	0.20	116
Microbacterium	33882	7.15	<0.01%	0.13	0.13	141
Corynebacterium ureicelerivorans	401472	6.49	<0.01%	0.13	0.17	110
Actinobacteria	201174	6.46	<0.01%	0.31	0.38	6
Exiguobacterium alkaliphilum 12/1	506480	6.96	<0.01%	0.14	0.48	93
Acetobacterium woodii DSM 1030	931626	6.88	<0.01%	0.11	0.11	164
Candidatus Vampirococcus archaeovorus	1930593	7.46	<0.01%	0.12	0.12	171

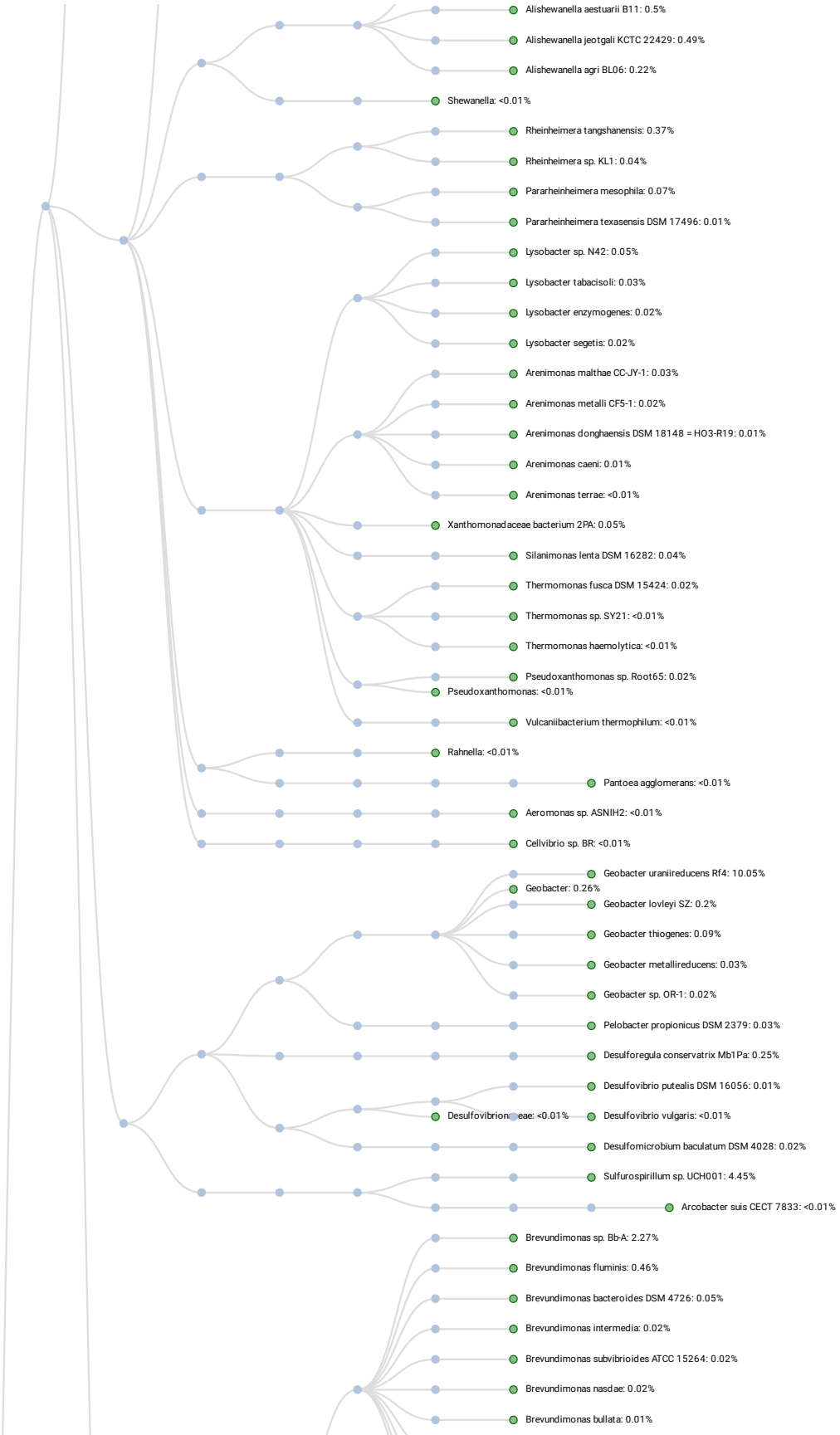
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Brachymonas chironomi DSM 19884	1121116	6.16	<0.01%	0.10	0.10	161
Tepidicella xavieri	360241	5.85	<0.01%	0.10	0.11	155
Pigmentiphaga sp. NML080357	2008675	5.43	<0.01%	0.11	0.10	517
Bordetella hinzii	103855	5.36	<0.01%	0.18	0.15	17
Desulfovibrio vulgaris	881	5.76	<0.01%	0.13	0.12	64
Acinetobacter kookii	1226327	5.47	<0.01%	0.14	0.33	37
Shewanella	22	5.85	<0.01%	0.12	0.12	31
Rahnella	34037	5.28	<0.01%	0.14	0.16	23
Vulcaniibacterium thermophilum	1169913	6.25	<0.01%	0.11	0.11	180
Thermomonas haemolytica	141949	5.93	<0.01%	0.12	0.12	109
Paracoccus haeundaensis	225362	5.62	<0.01%	0.13	0.16	64
Methylobacterium brachiatum	269660	6.02	<0.01%	0.12	0.28	105
Methylocystaceae	31993	5.3	<0.01%	0.19	0.20	4
Dietzia sp. 111N12-1	1785156	5.43	<0.01%	0.13	0.30	55
Verrucomicrobia	74201	6.21	<0.01%	40.00	40.00	2
Ignavibacteriales	795748	6.1	<0.01%	22.22	22.22	4
Pedobacter sp. CJ43	2605747	6.09	<0.01%	0.17	0.21	27
Delftia tsuruhatensis	180282	4.87	<0.01%	0.12	0.40	44
unclassified Candidatus Accumulibacter	2619054	4.25	<0.01%	0.15	0.15	7
Acinetobacter pseudolwoffii	2053287	4.85	<0.01%	0.15	0.13	19
Acinetobacter tjernbergiae	202955	4.74	<0.01%	0.10	0.10	69
Pantoea agglomerans	549	4.39	<0.01%	0.33	0.20	3
Pseudoxanthomonas	83618	4.95	<0.01%	0.13	0.11	4
Cellvibrio sp. BR	1134474	4.11	<0.01%	0.10	0.15	45
Erythrobacter sp. CCH5-A1	1768792	4.21	<0.01%	0.15	0.33	15
Methylobacterium sp. GXF4	1096546	5.19	<0.01%	0.10	0.25	117
Lactiplantibacillus plantarum	1590	4.16	<0.01%	0.17	0.39	10
Arcobacter suis CECT 7833	663365	3.98	<0.01%	0.15	0.14	13
unclassified Mesorhizobium	325217	3.65	<0.01%	0.16	0.16	9
Propionibacteriaceae	31957	3.38	<0.01%	0.19	0.60	6
Candidatus Planktophila sp.	2175601	3.96	<0.01%	0.16	0.13	10
Sphaerobacteraceae	85002	2.91	<0.01%	10.34	10.34	4
actinobacterium SCGC AAA028-A23	932036	2.25	<0.01%	0.17	0.11	3

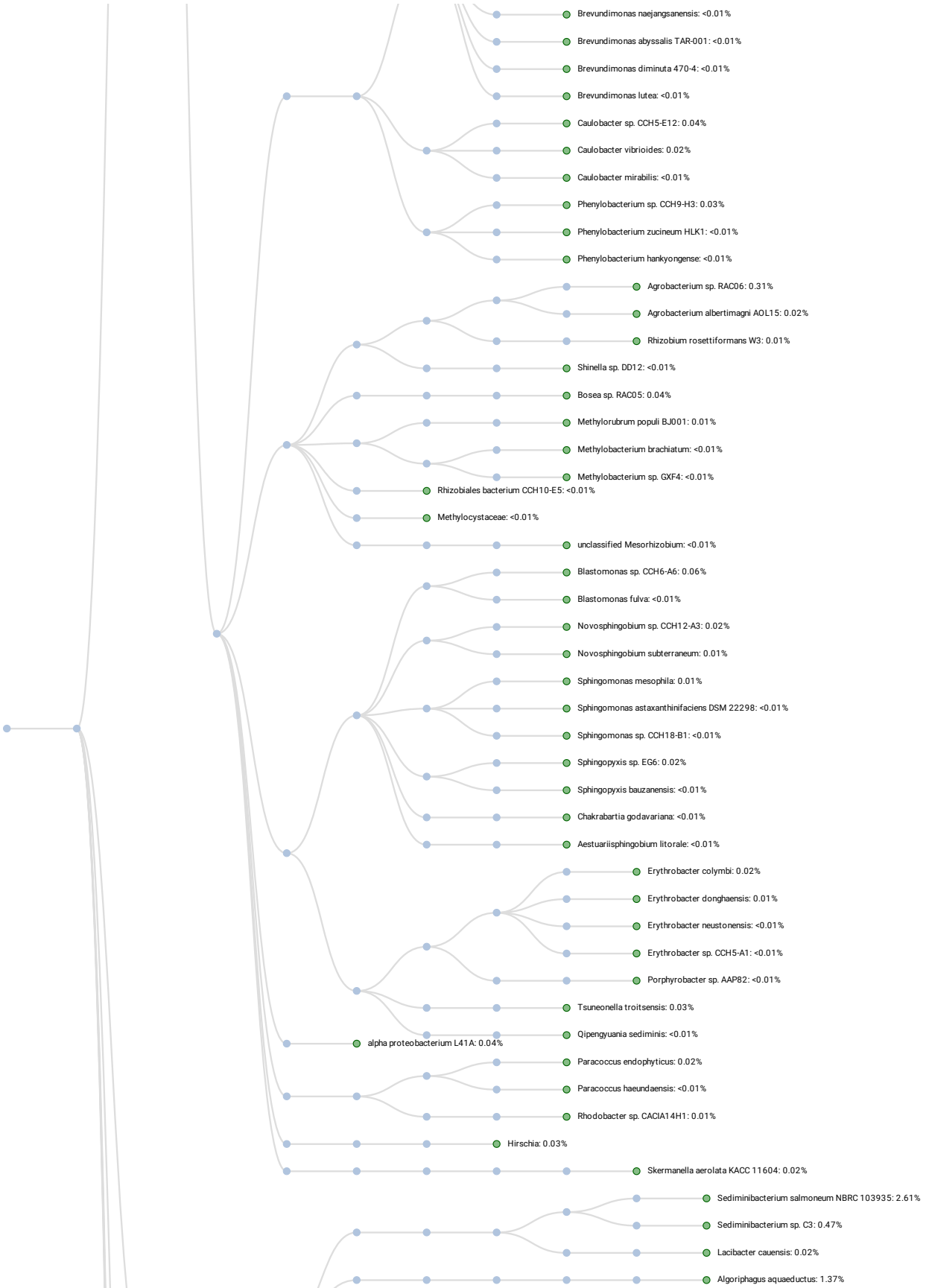
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
actinobacterium SCGC AAA027-L06	913338	2.19	<0.01%	0.12	0.11	5
Parcubacteria bacterium SCGC AAA011-A09	1046987	2.68	<0.01%	0.12	0.12	8
Leptospira	171	2.21	<0.01%	7.41	7.41	2
unclassified Methylophilus	2630143	1.25	<0.01%	0.96	1.20	6
Cutibacterium acnes	1747	1.56	<0.01%	0.17	4.01	2

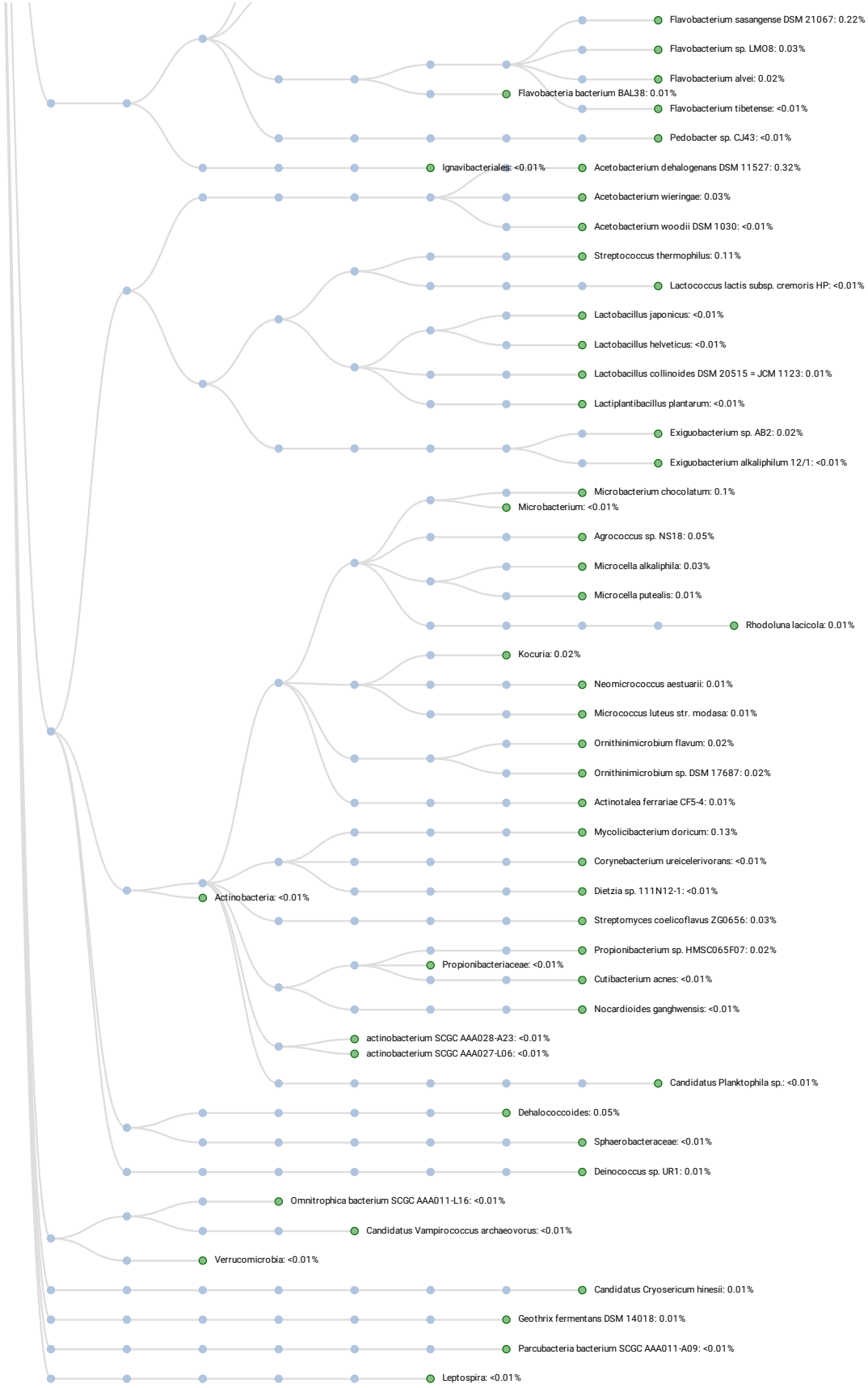

Comamonas sp. CAH-2: 15.5%
Comamonas aquatica DA1877: 8.86%
Comamonas thiooxydans: 0.08%
Comamonas granuli NBRC 101663: 0.08%
Acidovorax temperans: 7.45%
Acidovorax sp. NO-1: 3.08%
Acidovorax defluvii: 0.59%
Acidovorax soli: 0.49%
Acidovorax ebreus TPSY: 0.06%
Acidovorax kalamii: 0.05%
Acidovorax delafieldii 2AN: 0.04%
Malikia spinosa: 5.61%
Malikia granosa: 1.9%
Limnohabitans sp. Hippo3: 1.09%
Limnohabitans curvus: 0.16%
Limnohabitans parvus II-B4: 0.02%
Limnohabitans planktonicus II-D5: 0.01%
Hydrogenophaga sp. IBVHS2: 0.82%
Simplicispira lacusdiani: 0.29%
Simplicispira metamorpha: 0.02%
Simplicispira hankyongi: 0.01%
Simplicispira suum: 0.01%
Simplicispira psychrophila DSM 11588: <0.01%
Comamonadaceae bacterium 2PF: 0.07%
Comamonadaceae bacterium CD01: <0.01%
Comamonadaceae bacterium BICA1-1: <0.01%
Diaphorobacter sp. J5-51: 0.07%
Alicycliphilus sp. B1: 0.04%
Alicycliphilus denitrificans K601: 0.03%
Serpentinomonas mccroryi: 0.06%
Serpentinomonas raichei: <0.01%
Rhodoferax bucti: 0.03%
Rhodoferax sp. TS-BS-61-7: 0.01%
Rhodoferax saidenbachensis ED16: <0.01%
Delftia sp. K82: 0.02%
Delftia lacustris: 0.01%
Delftia acidovorans CCUG 274B: <0.01%
Delftia tsuruhatensis: <0.01%
Macromonas sp. BK-30: 0.02%
Macromonas bipunctata: 0.02%
Pelomonas saccharophila: 0.01%
Pelomonas puraquae: 0.01%
Pelomonas sp. Root1444: 0.01%
Curvibacter lanceolatus ATCC 14669: 0.01%
Curvibacter gracilis ATCC BAA-807: 0.01%
Curvibacter sp. PAE-UM: 0.01%
Melaminivora alkalimesophila: 0.01%
Melaminivora sp. SC2-9: <0.01%

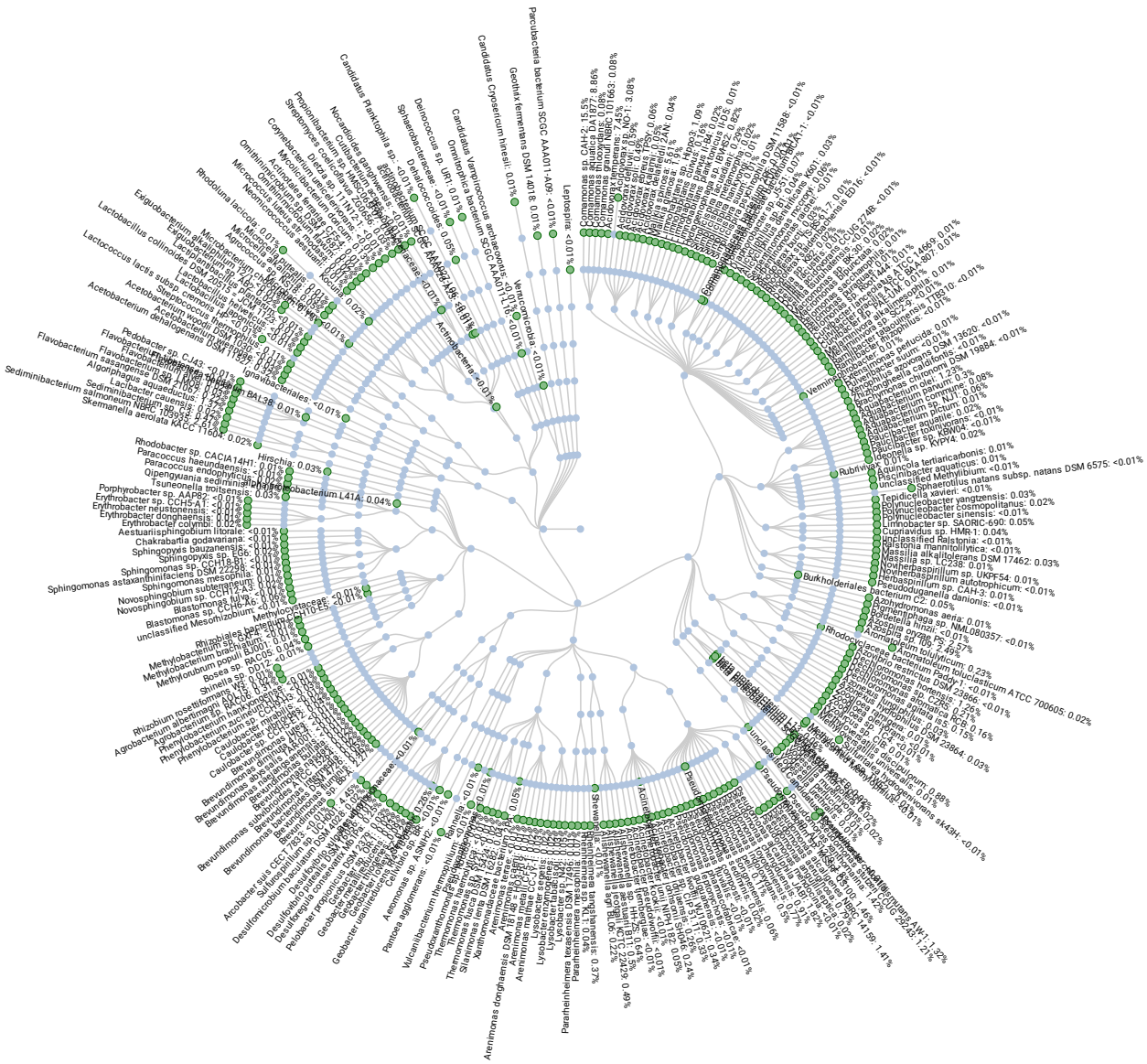

Ramlibacter rhizophilus: <0.01%
Verminephrobacter: 0.01%
Extensimonas perlucida: 0.01%
Pulveribacter suum: <0.01%
Xenophilus azovorans DSM 13620: <0.01%
Zhizhongheella caldifontis: <0.01%
Brachymonas chironomi DSM 19884: <0.01%
Aquabacterium olei: 1.23%
Aquabacterium parvum: 0.3%
Aquabacterium commune: 0.08%
Aquabacterium sp. NJ1: 0.06%
Aquabacterium pictum: 0.01%
Paucibacter aquatile: 0.02%
Paucibacter toxinivorans: <0.01%
Paucibacter sp. KBW04: <0.01%
Ideonella sp. KYPY4: 0.02%
Rubrivivax: 0.01%
Aquincola tertiaricarbonis: 0.01%
Piscinibacter aquaticus: 0.01%
unclassified Methylibium: <0.01%
Sphaerotilus natans subsp. natans DSM 6575: <0.01%
Tepidicella xavieri: <0.01%
Polynucleobacter yangtzensis: 0.03%
Polynucleobacter cosmopolitanus: 0.02%
Polynucleobacter sinensis: <0.01%
Limnobacter sp. SAORIC-690: 0.05%
Cupriavidus sp. HMR-1: 0.04%
unclassified Ralstonia: <0.01%
Ralstonia mannitolilytica: <0.01%
Massilia alkalitolerans DSM 17462: 0.03%
Massilia sp. LC238: 0.01%
Noviherbaspirillum sp. UKPF54: 0.01%
Noviherbaspirillum autotrophicum: <0.01%
Herbaspirillum sp. CAH-3: 0.01%
Pseudoduganella danionis: <0.01%
Burkholderiales bacterium C2: 0.05%
Azohydromonas aeria: 0.01%
Pigmentiphaga sp. NML080357: <0.01%
Bordetella hinzii: <0.01%
Azospira oryzae PS: 2.57%
Azospira sp. I09: 2.49%
Aromatoleum tolulyticum: 0.23%
Aromatoleum toluclasticum ATCC 700605: 0.02%
Rhodocyclaceae bacterium Paddy-1: <0.01%
Azovibrio restrictus DSM 23866: <0.01%
Dechloromonas hortensis: 1.26%
Dechloromonas sp. CZR5: 0.21%


Dechloromonas aromatica RCB: 0.16%
Dechloromonas agitata is5: 0.15%
Azonexus fungiphilus: 0.03%
Azonexus hydrophilus DSM 23864: 0.03%
Zoogloea ramigera: 0.01%
Zoogloea oleivorans: <0.01%
Zoogloea sp. 1C4: <0.01%
Azoarcus sp. CIB: 0.01%
Methyloversatilis discipulorum: 0.88%
Methyloversatilis universalis: 0.01%
Sulfuritalea hydrogenivorans sk43H: <0.01%
Methylophilus sp. TWE2: <0.01%
unclassified Methylophilus: <0.01%
beta proteobacterium L13: 0.06%
beta proteobacterium CB: 0.04%
beta proteobacterium SCGC AAA028-K02: <0.01%
Vogesella sp. EB: 0.02%
Vogesella indigofera: 0.02%
Vogesella mureinivorans: 0.02%
Vogesella perlucida: 0.01%
Vogesella urethralis: 0.01%
unclassified Candidatus Accumulibacter: <0.01%
Pseudomonas chloritidismutans AW-1: 1.32%
Pseudomonas stutzeri CCUG 29243: 1.21%
Pseudomonas xanthomarina: 1.42%
Pseudomonas sp. ALS1279: 1.8%
Rhizobium sp. MSSRF QS100: 1.46%
Pseudomonas alcaligenes NBRC 14159: 1.41%
Pseudomonas aeruginosa: 0.79%
Pseudomonas anguilliseptica: 0.02%
Pseudomonas mendocina: <0.01%
Pseudomonas alcaliphila JAB1: 1.82%
Pseudomonas chengduensis: 0.91%
Pseudomonas toyotomiensis: 0.77%
Pseudomonas indoloxydans: 0.5%
Pseudomonas peli: 0.11%
Pseudomonas songnenensis: 0.06%
Pseudomonas sediminis: 0.02%
Pseudomonas: 0.02%
Pseudomonas composti: <0.01%
Pseudomonas fluvialis: <0.01%
Pseudomonas pharmacofabricae: <0.01%
Pseudomonas leptonychotis: <0.01%
Pseudomonas guguanensis: <0.01%
Acinetobacter lwoffii WJ10621: 0.34%
Acinetobacter sp. CIP 51.11: 0.33%
Acinetobacter idrijaensis: 0.26%
Acinetobacter johnsonii SH046: 0.24%
Acinetobacter: 0.06%
Acinetobacter junii NIPH 182: 0.05%
Acinetobacter kookii: <0.01%
Acinetobacter pseudolwoffii: <0.01%
Acinetobacter tjernbergiae: <0.01%
Alishewanella sp. HH-ZS: 0.64%

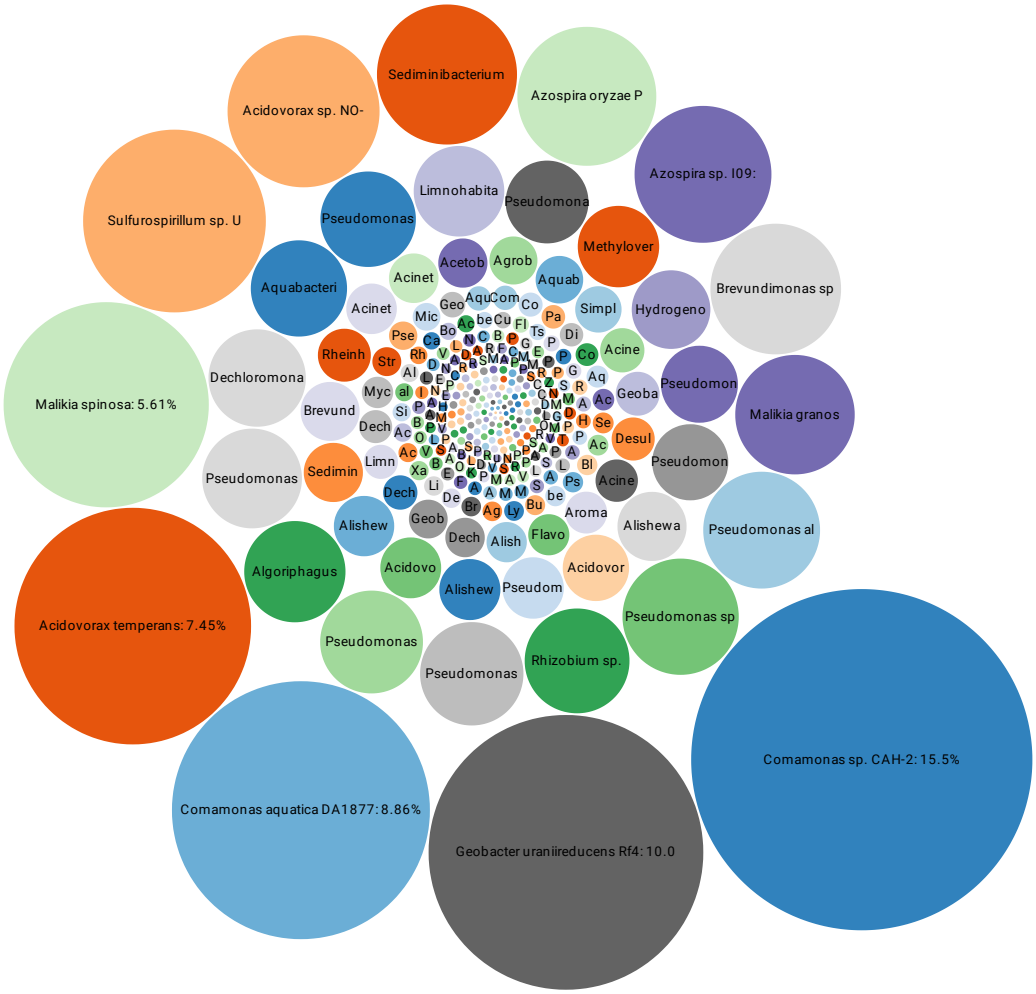

Alishewanella aestuarii B11: 0.5%
Alishewanella jeotgali KCTC 22429: 0.49%
Alishewanella agri BL06: 0.22%
Shewanella: <0.01%
Rheinheimera tangshanensis: 0.37%
Rheinheimera sp. KL1: 0.04%
Pararheinheimera mesophila: 0.07%
Pararheinheimera texasensis DSM 17496: 0.01%
Lysobacter sp. N42: 0.05%
Lysobacter tabacisoli: 0.03%
Lysobacter enzymogenes: 0.02%
Lysobacter segetis: 0.02%
Arenimonas malthae CC-JY-1: 0.03%
Arenimonas metalli CF5-1: 0.02%
Arenimonas donghaensis DSM 18148 = HO3-R19: 0.01%
Arenimonas caeni: 0.01%
Arenimonas terrae: <0.01%
Xanthomonadaceae bacterium 2PA: 0.05%
Silanimonas lenta DSM 16282: 0.04%
Thermomonas fusca DSM 15424: 0.02%
Thermomonas sp. SY21: <0.01%
Thermomonas haemolytica: <0.01%
Pseudoxanthomonas sp. Root65: 0.02%
Pseudoxanthomonas: <0.01%
Vulcaniibacterium thermophilum: <0.01%
Rahnella: <0.01%
Pantoea agglomerans: <0.01%
Aeromonas sp. ASNIH2: <0.01%
Cellvibrio sp. BR: <0.01%
Geobacter uraniireducens Rf4: 10.05%
Geobacter: 0.26%
Geobacter lovleyi SZ: 0.2%
Geobacter thiogenes: 0.09%
Geobacter metallireducens: 0.03%
Geobacter sp. OR-1: 0.02%
Pelobacter propionicus DSM 2379: 0.03%
Desulforegula conservatrix Mb1Pa: 0.25%
Desulfovibrio putealis DSM 16056: 0.01%
Desulfovibrionaceae: <0.01%
Desulfovibrio vulgaris: <0.01%
Desulfomicrobium baculatum DSM 4028: 0.02%
Sulfurospirillum sp. UCH001: 4.45%
Arcobacter suis CECT 7833: <0.01%
Brevundimonas sp. Bb-A: 2.27%
Brevundimonas fluminis: 0.46%
Brevundimonas bacteroides DSM 4726: 0.05%
Brevundimonas intermedia: 0.02%
Brevundimonas subvibrioides ATCC 15264: 0.02%
Brevundimonas nasdae: 0.02%
Brevundimonas bullata: 0.01%


Brevundimonas naejangsanensis: <0.01%
Brevundimonas abyssalis TAR-001: <0.01%
Brevundimonas diminuta 470-4: <0.01%
Brevundimonas lutea: <0.01%
Caulobacter sp. CCH5-E12: 0.04%
Caulobacter vibrioides: 0.02%
Caulobacter mirabilis: <0.01%
Phenylobacterium sp. CCH9-H3: 0.03%
Phenylobacterium zucineum HLK1: <0.01%
Phenylobacterium hankyongense: <0.01%
Agrobacterium sp. RAC06: 0.31%
Agrobacterium albertimagni AOL15: 0.02%
Rhizobium rosettiformans W3: 0.01%
Shinella sp. DD12: <0.01%
Bosea sp. RAC05: 0.04%
Methylorubrum populi BJ001: 0.01%
Methylobacterium brachiatum: <0.01%
Methylobacterium sp. GXF4: <0.01%
Rhizobiales bacterium CCH10-E5: <0.01%
Methylocystaceae: <0.01%
unclassified Mesorhizobium: <0.01%
Blastomonas sp. CCH6-A6: 0.06%
Blastomonas fulva: <0.01%
Novosphingobium sp. CCH12-A3: 0.02%
Novosphingobium subterraneum: 0.01%
Sphingomonas mesophila: 0.01%
Sphingomonas astaxanthinifaciens DSM 22298: <0.01%
Sphingomonas sp. CCH18-B1: <0.01%
Sphingopyxis sp. EG6: 0.02%
Sphingopyxis bauzanensis: <0.01%
Chakrabartia godavariana: <0.01%
Aestuariisphingobium litorale: <0.01%
Erythrobacter colymbi: 0.02%
Erythrobacter donghaensis: 0.01%
Erythrobacter neustonensis: <0.01%
Erythrobacter sp. CCH5-A1: <0.01%
Porphyrobacter sp. AAP82: <0.01%
Tsuneonella troitsensis: 0.03%
Qipengyuania sediminis: <0.01%
alpha proteobacterium L41A: 0.04%
Paracoccus endophyticus: 0.02%
Paracoccus haeundaensis: <0.01%
Rhodobacter sp. CACIA14H1: 0.01%
Hirschia: 0.03%
Skermanella aerolata KACC 11604: 0.02%
Sediminibacterium salmoneum NBRC 103935: 2.61%
Sediminibacterium sp. C3: 0.47%
Lacibacter cauensis: 0.02%
Algoriphagus aquaeductus: 1.37%


Flavobacterium sasangense DSM 21067: 0.22%
Flavobacterium sp. LMO8: 0.03%
Flavobacterium alvei: 0.02%
Flavobacteria bacterium BAL38: 0.01%
Flavobacterium tibetense: <0.01%
Pedobacter sp. CJ43: <0.01%
Ignavibacteriales: <0.01%
Acetobacterium dehalogenans DSM 11527: 0.32%
Acetobacterium wieringae: 0.03%
Acetobacterium woodii DSM 1030: <0.01%
Streptococcus thermophilus: 0.11%
Lactococcus lactis subsp. cremoris HP: <0.01%
Lactobacillus japonicus: <0.01%
Lactobacillus helveticus: <0.01%
Lactobacillus collinoides DSM 20515 = JCM 1123: 0.01%
Lactiplantibacillus plantarum: <0.01%
Exiguobacterium sp. AB2: 0.02%
Exiguobacterium alkaliphilum 12/1: <0.01%
Microbacterium chocolatum: 0.1%
Microbacterium: <0.01%
Agrococcus sp. NS18: 0.05%
Microcella alkaliphila: 0.03%
Microcella putealis: 0.01%
Rhodoluna lacicola: 0.01%
Kocuria: 0.02%
Neomicrococcus aestuarii: 0.01%
Micrococcus luteus str. modasa: 0.01%
Ornithinimicrobium flavum: 0.02%
Ornithinimicrobium sp. DSM 17687: 0.02%
Actinotalea ferrariae CF5-4: 0.01%
Mycolicibacterium doricum: 0.13%
Corynebacterium ureicelerivorans: <0.01%
Dietzia sp. 111N12-1: <0.01%
Actinobacteria: <0.01%
Streptomyces coelicoflavus ZG0656: 0.03%
Propionibacterium sp. HMSC065F07: 0.02%
Propionibacteriaceae: <0.01%
Cutibacterium acnes: <0.01%
Nocardioides ganghwensis: <0.01%
actinobacterium SCGC AAA028-A23: <0.01%
actinobacterium SCGC AAA027-L06: <0.01%
Candidatus Planktophila sp.: <0.01%
Dehalococcoides: 0.05%
Sphaerobacteraceae: <0.01%
Deinococcus sp. UR1: 0.01%
Omnitrophica bacterium SCGC AAA011-L16: <0.01%
Candidatus Vampirococcus archaeovorus: <0.01%
Verrucomicrobia: <0.01%
Candidatus Cryosericum hinesii: 0.01%
Geothrix fermentans DSM 14018: 0.01%
Parcubacteria bacterium SCGC AAA011-A09: <0.01%
Leptospira: <0.01%




Bacteria
Proteobacteria
Gammapr..acteria
Pseudomonadales
Pseudomonadaceae
Pseudomonas
Betapro..acteria
Burkholderiales
Comamonadaceae
Comamon..quatica
Acidov..perans
Acidovorax
Ac..1
u..x
Malli..nosa
Mallkia
Azospira
Rho...eae
Rhod..ales
D..m
u..a
P..p
Ps..up
un..as
delta/e..visions
Desulfu..nadales
Geobacteraceae
Geobacter
Geobact..ducens
Ep..ia
Ca..es
Ca..ae
Sul..lum
unc..lum
C..e
B..s
A..a
F..p
Ba..up
Ba..es
C..a
C..s
C..e
Se..um
S..m
Comamonas
unclass..mamonas
Aquabacterium olei - 1.23%
Limnohabitans sp. Hippo3 - 1.09%
Mallkia granosa - 1.9%
Mallkia spinosa - 5.61%
Acidovorax sp. NO-1 - 3.08%
Acidovorax temperans - 7.45%
Comamonas aquatica DA1877 - 8.86%
Comamonas sp. CAH2 - 15.5%
Algoriphagus aquaeductus - 1.37%
Sediminibacterium salmoneum NBRC 103935 - 2.61%
Brevundimonas sp. Bb-A - 2.27%
Sulfurospirillum sp. UCH001 - 4.45%
Geobacter uraniireducens Rf4 - 10.05%
Pseudomonas alcaliphila JAB1 - 1.82%
Pseudomonas alcaligenes NBRC 14159 - 1.41%
Rhizobium sp. MSSRF QS100 - 1.46%
Pseudomonas sp. ALS1279 - 1.8%
Pseudomonas xanthomarina - 1.42%
Pseudomonas stutzeri CCUG 29243 - 1.21%
Pseudomonas chloritidismutans AW-1 - 1.32%
Dechloromonas hortensis - 1.26%
Azospira sp. I09 - 2.49%
Azospira oryzae PS - 2.57%
5 more
4 more
3 more
12 more
9 more
25 more
6 more
10 more


Sediminibacterium
Azospira oryzae P
Acidovorax sp. NO-
Azospira sp. I09:
Sulfurospirillum sp. U
Limnohabita
Pseudomona
Pseudomonas
Methylover
Acetob
Agrob
Aquabacteri
Aquab
Acinet
Brevundimonas sp
Simpl
Hydrogeno
Malikia spinosa: 5.61%
Dechloromona
Rheinh
Str
Acine
Pseudomon
Malikia granos
Brevund
Geoba
Desul
Pseudomonas
Sedimin
Pseudomon
Acine
Alishew
Geob
Alishewa
Pseudomonas al
Algoriphagus
Dech
Alish
Flavo
Acidovo
Acidovor
Alishew
Pseudom
Pseudomonas sp
Acidovorax temperans: 7.45%
Pseudomonas
Pseudomonas
Rhizobium sp.
Comamonas sp. CAH-2: 15.5%
Comamonas aquatica DA1877: 8.86%
Geobacter uraniireducens Rf4: 10.0

Fasta/q details

Name	Value
Hit	309

Table

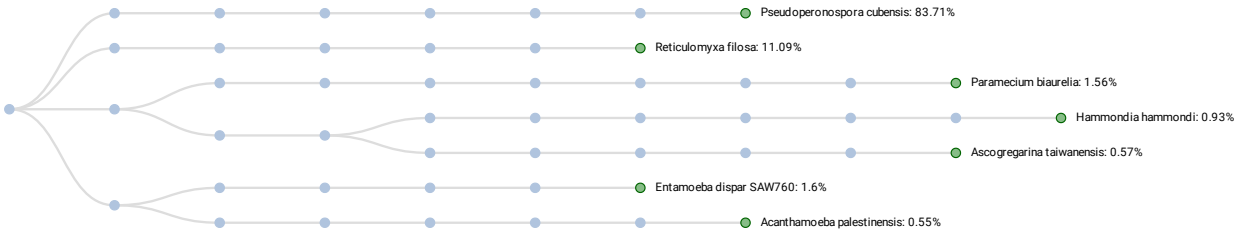
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Ralstonia virus RSA1	406340	9.19	100.00%	0.10	0.10	104

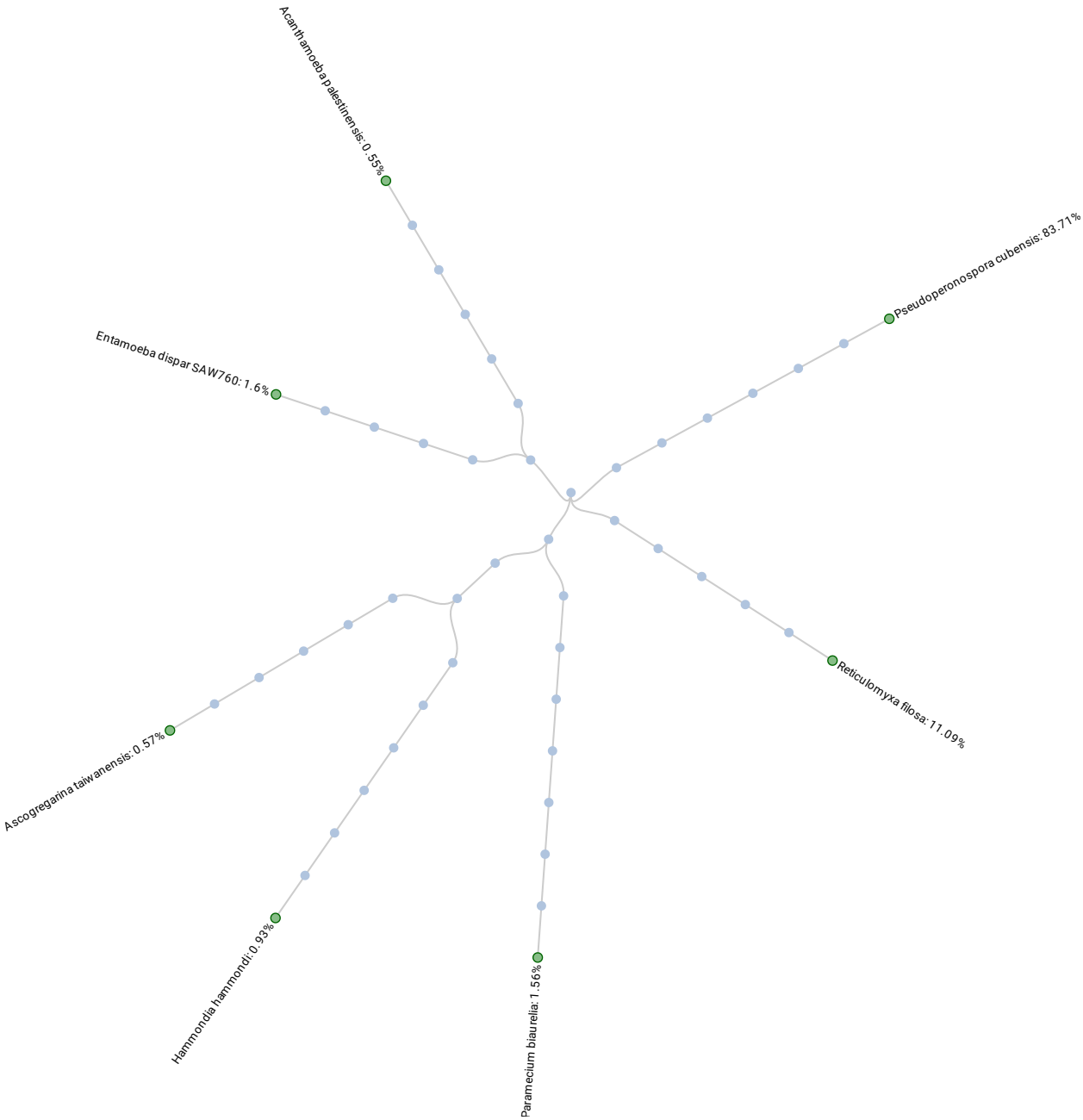
Fasta/q details

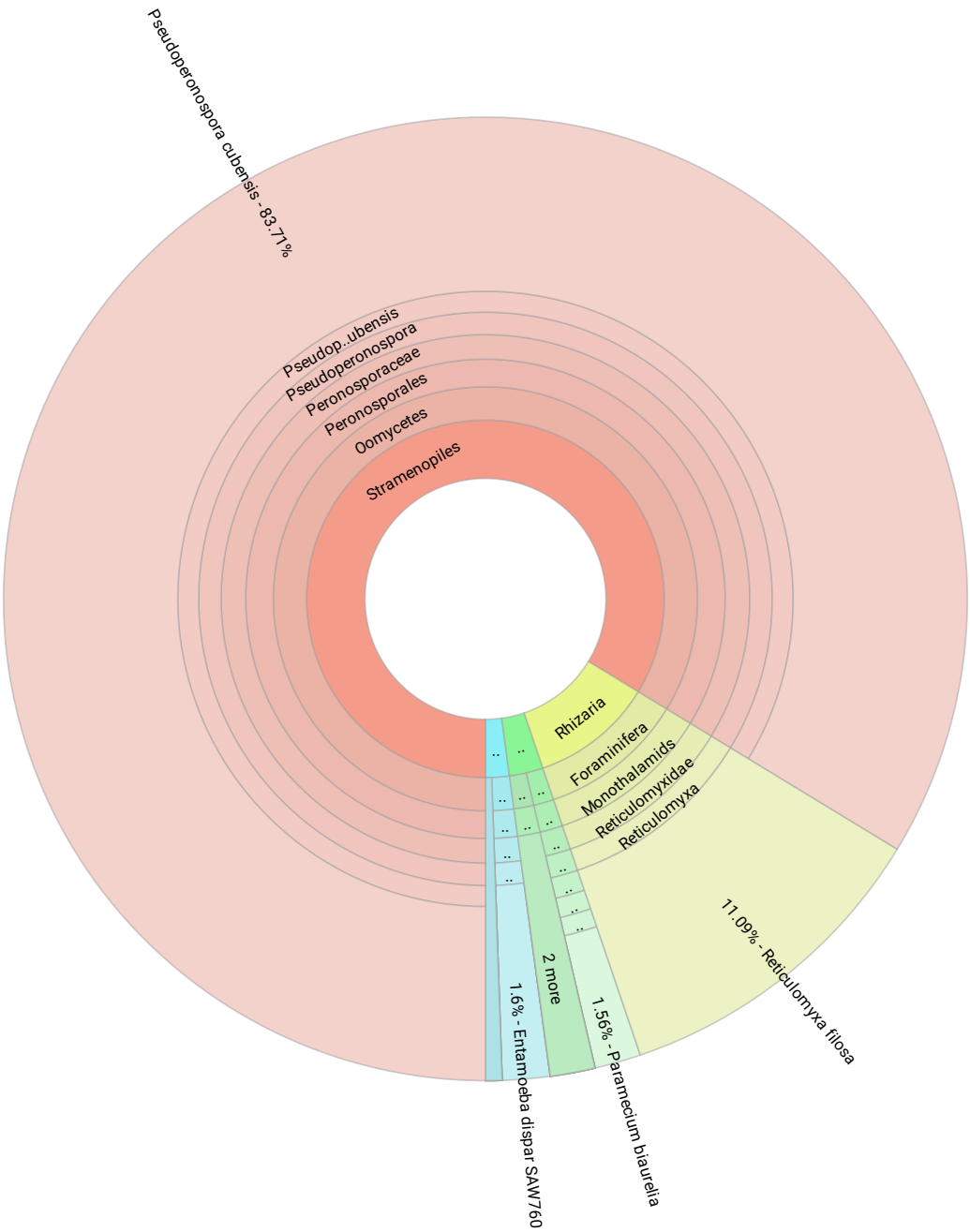
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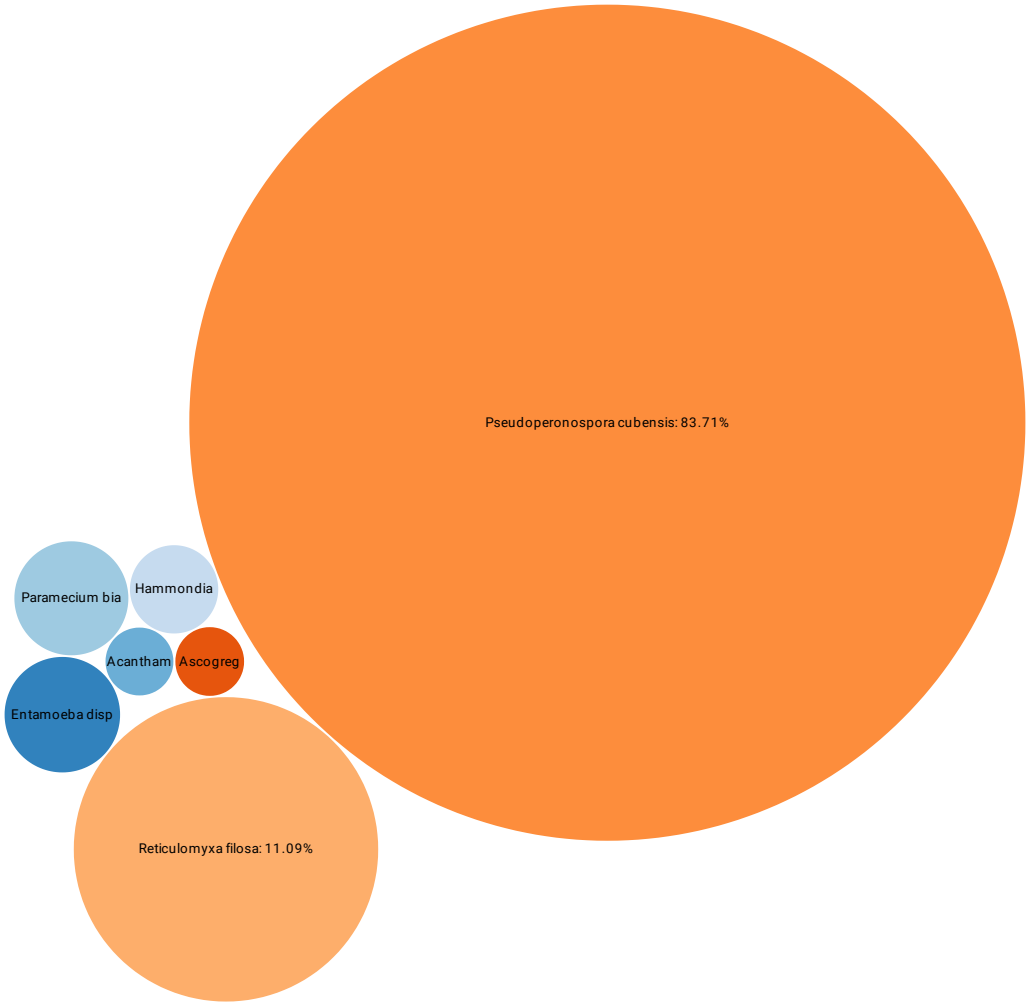
Table

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Pseudoperonospora cubensis	143453	59.23	83.71%	0.53	0.62	2587
Reticulomyxa filosa	46433	7.85	11.09%	0.04	0.06	722
Entamoeba dispar SAW760	370354	1.13	1.60%	0.03	0.03	31
Paramecium biaurelia	65126	1.1	1.56%	0.02	0.02	63
Hammondia hammondi	99158	0.66	0.93%	0.02	0.02	42
Ascogregarina taiwanensis	158379	0.4	0.57%	0.01	0.01	23
Acanthamoeba palestinensis	28015	0.39	0.55%	0.01	0.03	24


Pseudoperonospora cubensis: 83.71%
Reticulomyxa filosa: 11.09%
Paramecium biaurelia: 1.56%
Hammondia hammondi: 0.93%
Ascogregarina taiwanensis: 0.57%
Entamoeba dispar SAW760: 1.6%
Acanthamoeba palestinensis: 0.55%


Acanthamoeba palestinensis: 0.55%
Pseudoperonospora cubensis: 83.71%
Entamoeba dispar SAW760: 1.6%
Reticulomyxa filosa: 11.09%
Ascogregarina taiwanensis: 0.57%
Hammondia hammondi: 0.93%
Paramecium biaurelia: 1.56%


Pseudoperonospora cubensis - 83.71%
Pseudop...ubensis
Pseudoperonospora
Peronosporaceae
Peronosporales
Oomycetes
Stramenopiles
Rhizaria
Foraminifera
Monothalamids
Reticulomyxidae
Reticulomyxa
11.09% - Reticulomyxa filosa
1.56% - Paramecium biaurelia
2 more
1.6% - Entamoeba dispar SAW760

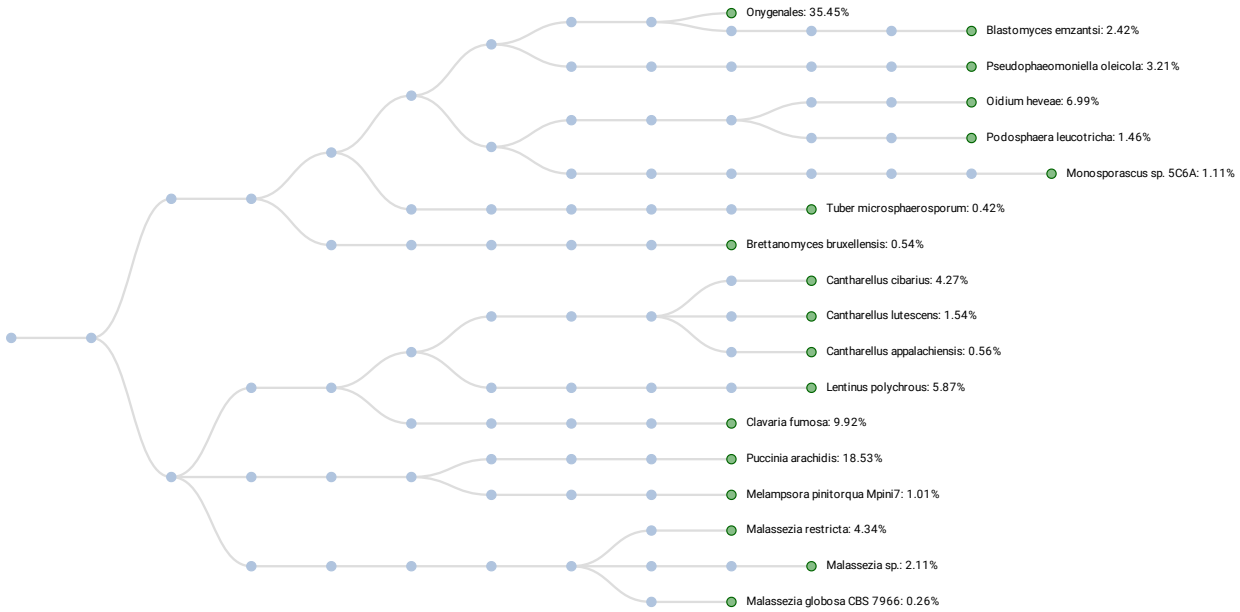

Pseudoperonospora cubensis: 83.71%
Paramecium bia
Hammondia
Acantham
Ascogreg
Entamoeba disp
Reticulomyxa filosa: 11.09%

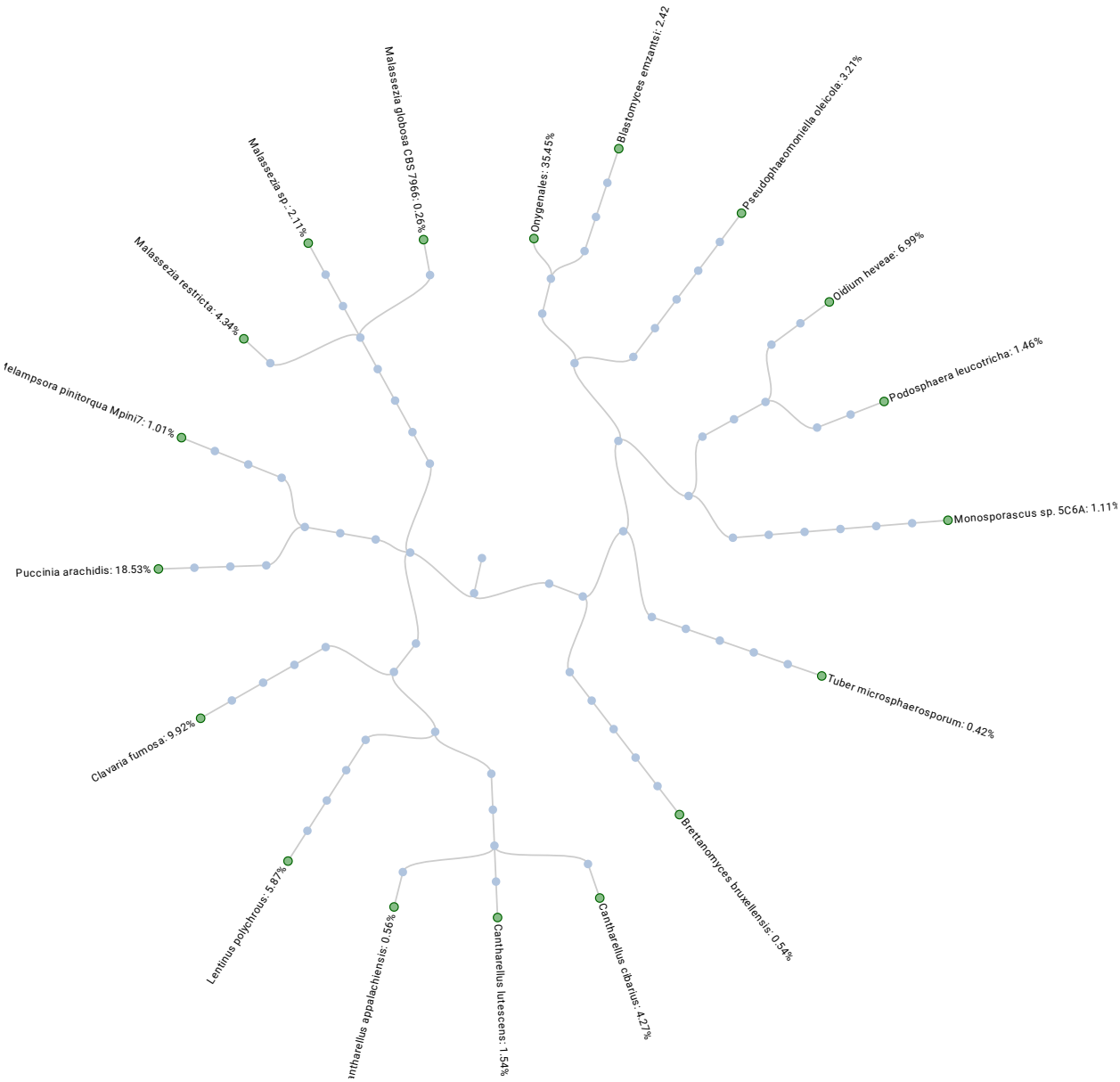
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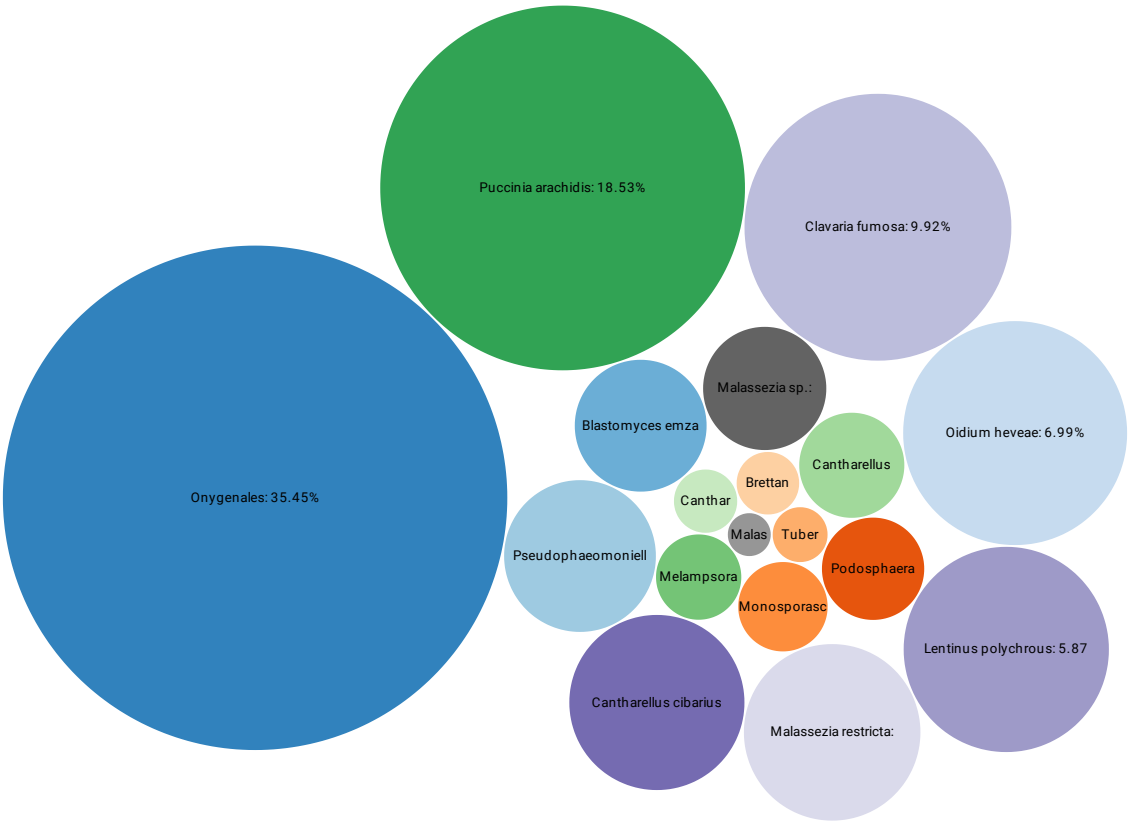
Table

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Onygenales	33183	56.68	35.45%	0.38	0.57	2391
Puccinia arachidis	333523	29.63	18.53%	0.36	0.44	1079
Clavaria fumosa	264083	15.86	9.92%	0.18	0.56	770
Oidium heveae	299130	11.17	6.99%	0.19	0.16	378
Lentinus polychrous	292559	9.38	5.87%	0.17	0.19	924
Malassezia restricta	76775	6.94	4.34%	0.13	0.13	162
Cantharellus cibarius	36066	6.83	4.27%	0.10	0.10	335
Pseudophaeomoniella oleicola	1671306	5.13	3.21%	0.02	0.02	538
Blastomyces emzantsi	2723674	3.87	2.42%	0.07	0.05	150
Malassezia sp.	2011732	3.38	2.11%	0.08	0.12	54
Cantharellus lutescens	104198	2.46	1.54%	0.03	0.45	175
Podosphaera leucotricha	79249	2.33	1.46%	0.04	0.04	116
Monosporascus sp. 5C6A	2211642	1.78	1.11%	0.03	0.04	133
Melampsora pinitorqua Mpini7	1298852	1.62	1.01%	0.03	0.03	119
Cantharellus appalachiensis	409893	0.89	0.56%	0.02	0.37	54
Brettanomyces bruxellensis	5007	0.87	0.54%	0.02	0.02	73
Tuber microsphaerosporum	1455713	0.67	0.42%	0.02	0.02	43
Malassezia globosa CBS 7966	425265	0.41	0.26%	0.01	0.01	28


Onygenales: 35.45%
Blastomyces emzantsi: 2.42%
Pseudophaeomoniella oleicola: 3.21%
Oidium heveae: 6.99%
Podosphaera leucotricha: 1.46%
Monosporascus sp. 5C6A: 1.11%
Tuber microsphaerosporum: 0.42%
Brettanomyces bruxellensis: 0.54%
Cantharellus cibarius: 4.27%
Cantharellus lutescens: 1.54%
Cantharellus appalachiensis: 0.56%
Lentinus polychrous: 5.87%
Clavaria fumosa: 9.92%
Puccinia arachidis: 18.53%
Melampsora pinitorqua Mpini7: 1.01%
Malassezia restricta: 4.34%
Malassezia sp.: 2.11%
Malassezia globosa CBS 7966: 0.26%


Malassezia globosa CBS 7966: 0.26%
Malassezia sp.: 2.11%
Malassezia restricta: 4.34%
Melampsora pinitorqua Mpini7: 1.01%
Puccinia arachidis: 18.53%
Clavaria fumosa: 9.92%
Lentinus polychrous: 5.87%
Cantharellus appalachiensis: 0.56%
Cantharellus lutescens: 1.54%
Cantharellus cibarius: 4.27%
Brettanomyces bruxellensis: 0.54%
Tuber microsphaerosporum: 0.42%
Monosporascus sp. 5C6A: 1.11%
Podosphaera leucotricha: 1.46%
Oidium heveae: 6.99%
Pseudophaeomoniella oleicola: 3.21%
Blastomyces emzantsi: 2.42
Onygenales: 35.45%


Podosphaera leucotricha - 1.46%
1.11% - Monosporascus sp. 5C6A
4.27% - Cantharellus cibarius
1.54% - Cantharellus lutescens
5.87% - Lentinus polychrous
9.92% - Clavaria fumosa
18.53% - Puccinia arachidis
1.01% - Melampsora pinitorqua Mpin7
4.34% - Malassezia restricta
2.11% - Malassezia sp.
Onygenales - 35.45%
Blastomyces emzantsi - 2.42%
Pseudophaeomoniella oleicola - 3.21%
Oidium heveae - 6.99%
Dikarya
Ascomycota
Basidiomycota
saccharomyceta
Pezizomycotina
leotiomyceta
Eurotiomycetes
Onygenales
Agaricomycotina
Agaricomycetes
Agaricales
Clavariaceae
Clavaria
Lentinus
Polyporales
Cantharellus
Pucciniomycotina
Pucciniomycetes
Puccinia
Ustilaginomycotina
Malasseziales
Malassezia


Puccinia arachidis: 18.53%
Clavaria fumosa: 9.92%
Onygenales: 35.45%
Malassezia sp.:
Blastomyces emza
Oidium heveae: 6.99%
Cantharellus
Brettan
Canthar
Malas
Tuber
Pseudophaeomoniell
Podosphaera
Melampsora
Monosporasc
Lentinus polychrous: 5.87
Cantharellus cibarius
Malassezia restricta:

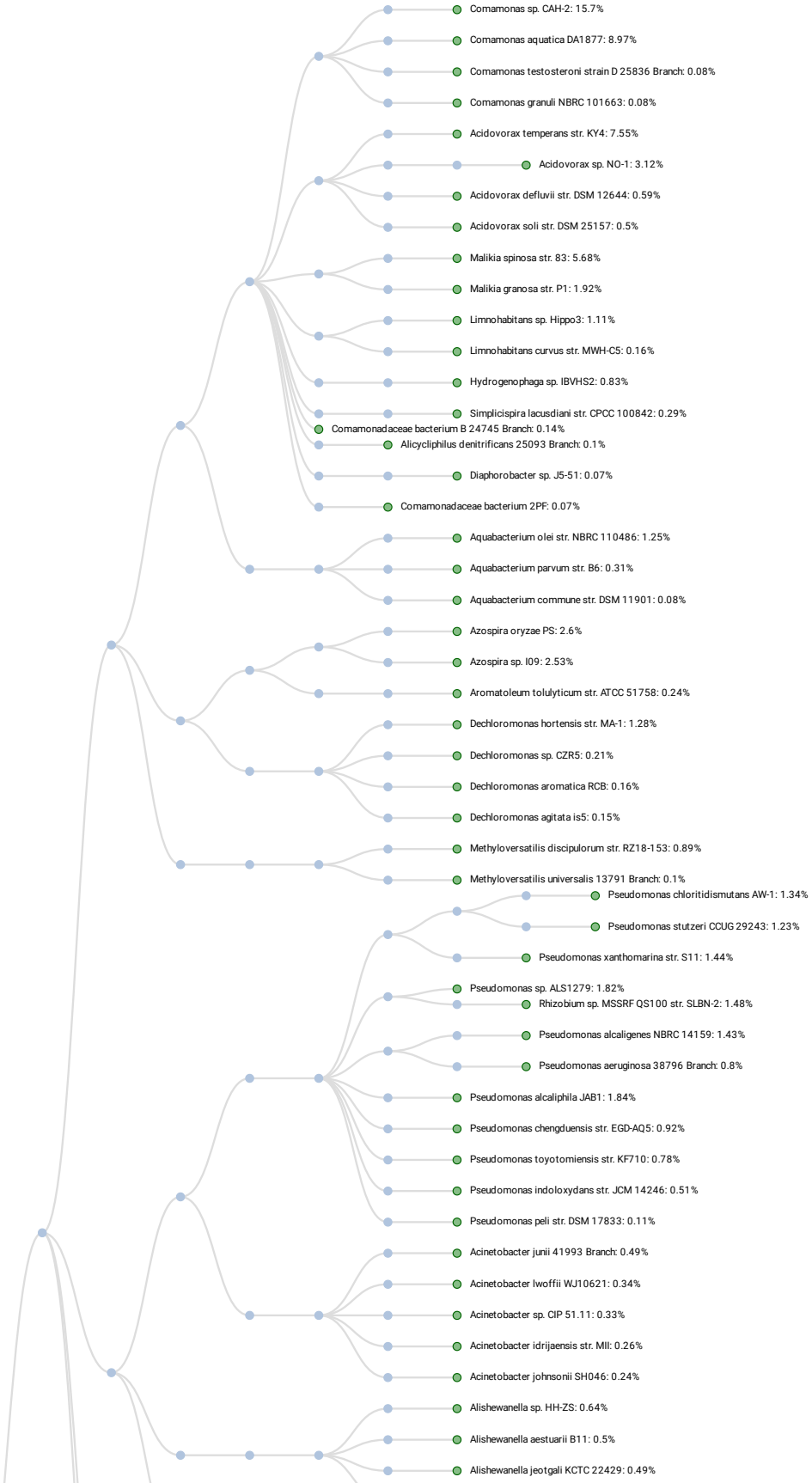
Table

Table

Name	Taxonomy Id	Kingdom	Unified RA	% Unique Matches	% Total Matches
Comamonas sp. CAH-2	2605745	Bacteria	15.70%	60.96	75.67
Geobacter uraniireducens Rf4	351605	Bacteria	10.18%	42.67	42.67
Comamonas aquatica DA1877	1457173	Bacteria	8.97%	10.51	48.31
Acidovorax temperans	80878	Bacteria	7.55%	42.62	42.72
Malikia spinosa	86180	Bacteria	5.68%	35.25	37.79
Sulfurospirillum sp. UCH001	1581011	Bacteria	4.50%	37.42	37.49
Acidovorax sp. NO-1	512030	Bacteria	3.12%	27.85	28.06
Sediminibacterium salmoneum NBRC 103935	1400522	Bacteria	2.65%	27.71	28.18
Azospira oryzae PS	640081	Bacteria	2.60%	13.99	25.60
Azospira sp. I09	1765049	Bacteria	2.53%	12.40	25.06
Brevundimonas sp. Bb-A	2560058	Bacteria	2.30%	11.54	22.48
Malikia granosa	263067	Bacteria	1.92%	12.81	17.83
Pseudomonas alcaliphila JAB1	741155	Bacteria	1.84%	10.24	18.40
Pseudomonas sp. ALS1279	1734450	Bacteria	1.82%	11.41	18.21
Rhizobium sp. MSSRF QS100	1522278	Bacteria	1.48%	8.92	15.53
Pseudomonas xanthomarina	271420	Bacteria	1.44%	3.55	15.42
Pseudomonas alcaligenes NBRC 14159	1215092	Bacteria	1.43%	8.30	14.94
Algoriphagus aquaeductus	475299	Bacteria	1.38%	15.53	15.53
Pseudomonas chloritidismutans AW-1	1263865	Bacteria	1.34%	2.98	14.44
Dechloromonas hortensis	337779	Bacteria	1.28%	13.35	13.49
Aquabacterium olei	1296669	Bacteria	1.25%	12.44	12.80
Pseudomonas stutzeri CCUG 29243	1196835	Bacteria	1.23%	2.53	13.55
Limnohabitans sp. Hippo3	1597956	Bacteria	1.11%	11.99	12.33
Pseudomonas chengduensis	489632	Bacteria	0.92%	2.99	10.25
Methyloversatilis discipulorum	1119528	Bacteria	0.89%	8.24	9.53
Hydrogenophaga sp. IBVHS2	1985170	Bacteria	0.83%	9.55	9.55
Pseudomonas aeruginosa	287	Bacteria	0.80%	21.05	21.05
Pseudomonas toyotomiensis	554344	Bacteria	0.78%	1.68	8.72
Alishewanella sp. HH-ZS	1856684	Bacteria	0.64%	4.79	7.68
Acidovorax defluvii	86669	Bacteria	0.59%	3.15	6.36
Pseudomonas indoloxydans	404407	Bacteria	0.51%	2.52	5.70
Alishewanella aestuarii B11	1197174	Bacteria	0.50%	2.44	6.18
Acidovorax soli	592050	Bacteria	0.50%	4.53	5.03

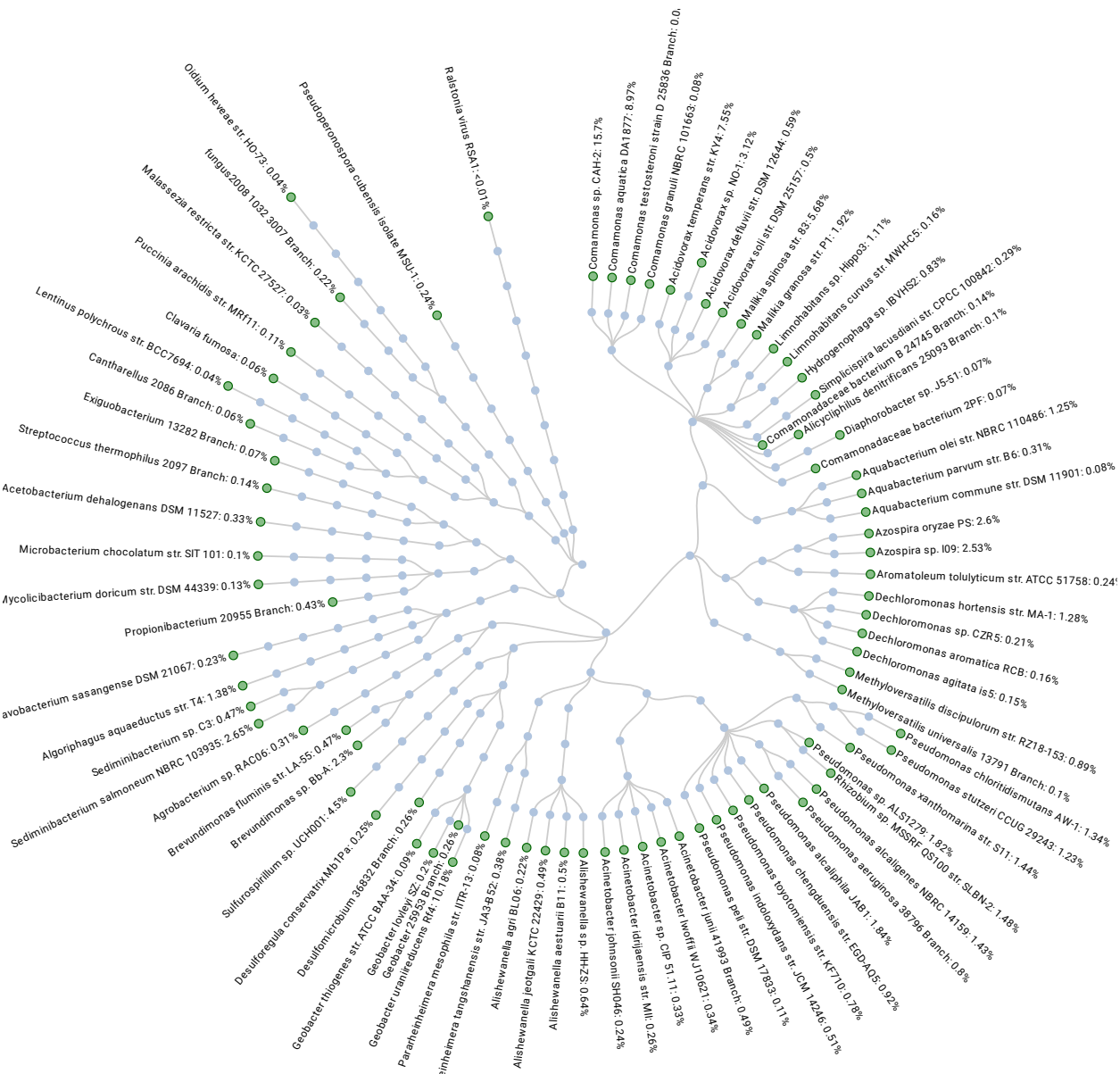
Name	Taxonomy Id	Kingdom	Unified RA	% Unique Matches	% Total Matches
Alishewanella jeotgali KCTC 22429	1129374	Bacteria	0.49%	2.17	5.99
Acinetobacter junii	40215	Bacteria	0.49%	1.33	6.37
Sediminibacterium sp. C3	1267211	Bacteria	0.47%	2.40	6.08
Brevundimonas fluminis	2487274	Bacteria	0.47%	5.64	5.64
Propionibacteriaceae	31957	Bacteria	0.43%	13.95	13.95
Rheinheimera tangshanensis	400153	Bacteria	0.38%	3.83	4.86
Acinetobacter lwoffii WJ10621	1046625	Bacteria	0.34%	2.96	4.95
Acinetobacter sp. CIP 51.11	1144670	Bacteria	0.33%	2.20	5.29
Acetobacterium dehalogenans DSM 11527	1068975	Bacteria	0.33%	3.66	3.92
Agrobacterium sp. RAC06	1842536	Bacteria	0.31%	1.31	3.77
Aquabacterium parvum	70584	Bacteria	0.31%	1.53	2.28
Simplicispira lacusdiani	2213010	Bacteria	0.29%	2.87	3.19
Acinetobacter idrijaensis	1507807	Bacteria	0.26%	1.24	4.20
Geobacter	28231	Bacteria	0.26%	4.49	4.41
Desulfomicrobium	898	Bacteria	0.26%	5.96	5.96
Desulforegula conservatrix Mb1Pa	1304885	Bacteria	0.25%	3.33	3.33
Acinetobacter johnsonii SH046	575586	Bacteria	0.24%	1.46	3.60
Pseudoperonospora cubensis	143453	Protists	0.24%	0.53	0.62
Aromatoleum tolulyticum	34027	Bacteria	0.24%	2.67	2.90
Flavobacterium sasangense DSM 21067	1121896	Bacteria	0.23%	2.85	3.13
Onygenales	33183	Fungi	0.22%	0.38	0.57
Alishewanella agri BL06	1195246	Bacteria	0.22%	1.09	3.00
Dechloromonas sp. CZR5	2608630	Bacteria	0.21%	2.38	2.63
Geobacter lovleyi SZ	398767	Bacteria	0.20%	1.56	1.89
Dechloromonas aromatica RCB	159087	Bacteria	0.16%	1.95	2.05
Limnohabitans curvus	323423	Bacteria	0.16%	1.54	2.18
Dechloromonas agitata is5	1304883	Bacteria	0.15%	1.74	1.94
Streptococcus thermophilus	1308	Bacteria	0.14%	0.72	0.73
Comamonadaceae	80864	Bacteria	0.14%	1.60	1.56
Mycolicibacterium doricum	126673	Bacteria	0.13%	1.67	1.76
Puccinia arachidis	333523	Fungi	0.11%	0.36	0.44
Pseudomonas peli	592361	Bacteria	0.11%	1.15	1.37
Microbacterium chocolatum	84292	Bacteria	0.10%	1.43	1.43
Alicycliphilus	201096	Bacteria	0.10%	0.22	0.22
Methyloversatilis universalis	378211	Bacteria	0.10%	1.34	1.51
Geobacter thiogenes	115783	Bacteria	0.09%	1.00	1.40
Aquabacterium commune	70586	Bacteria	0.08%	0.87	1.52

Name	Taxonomy Id	Kingdom	Unified RA	% Unique Matches	% Total Matches
Comamonas thiooxydans	363952	Bacteria	0.08%	0.18	0.18
Comamonas granuli NBRC 101663	1223521	Bacteria	0.08%	0.97	1.27
Pararheinheimera mesophila	1547515	Bacteria	0.08%	1.07	1.19
Diaphorobacter sp. J5-51	680496	Bacteria	0.07%	0.84	0.53
Comamonadaceae bacterium 2PF	2502197	Bacteria	0.07%	0.80	1.38
Exiguobacterium	33986	Bacteria	0.07%	0.72	0.72
Cantharellus	36065	Fungi	0.06%	0.97	0.97
Clavaria fumosa	264083	Fungi	0.06%	0.18	0.56
Oidium heveae	299130	Fungi	0.04%	0.19	0.16
Lentinus polychrous	292559	Fungi	0.04%	0.17	0.19
Malassezia restricta	76775	Fungi	0.03%	0.13	0.13
Ralstonia virus RSA1	406340	Viruses	<0.01%	0.10	0.10

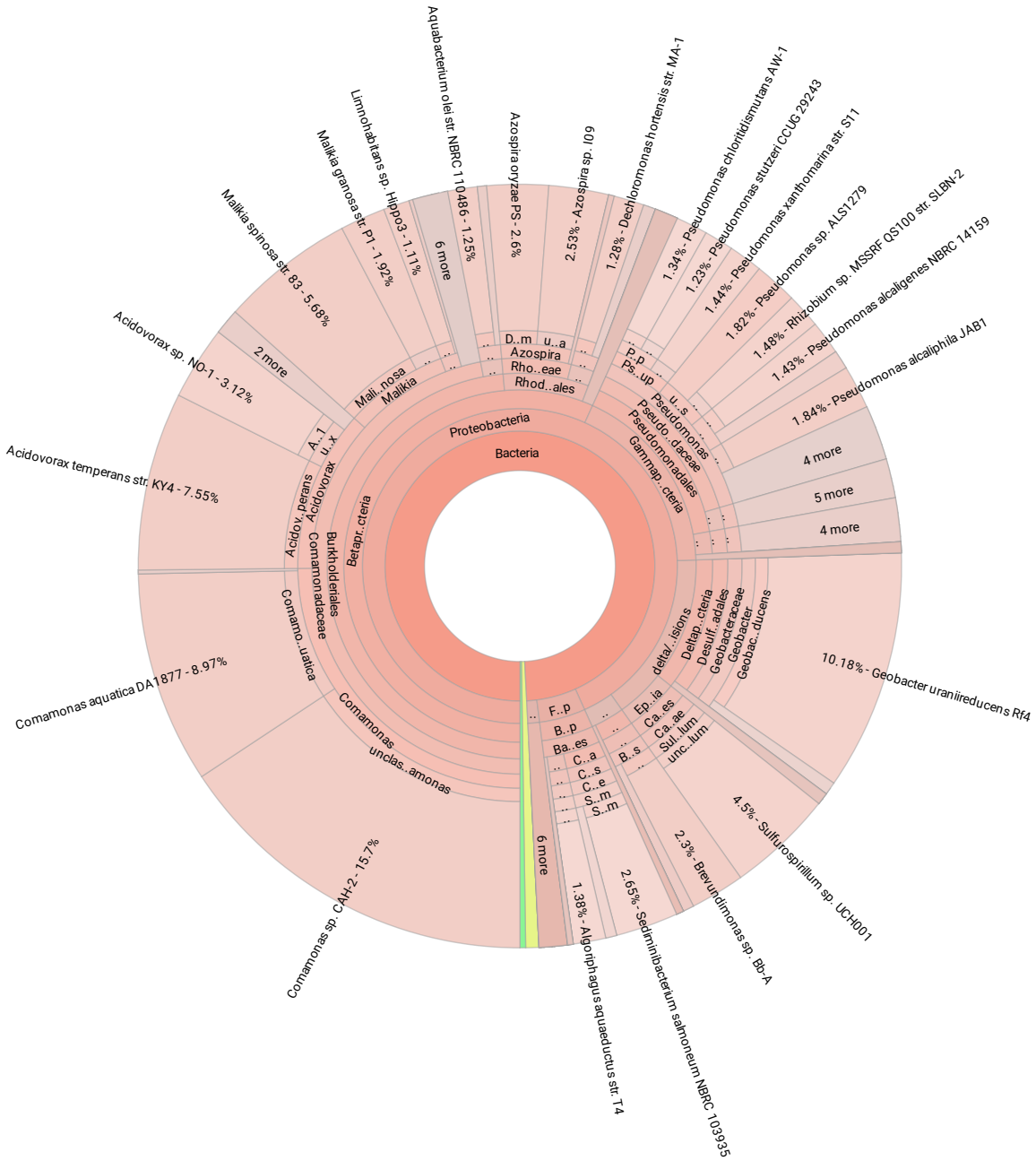

Comamonas sp. CAH-2: 15.7%
Comamonas aquatica DA1877: 8.97%
Comamonas testosteroni strain D 25836 Branch: 0.08%
Comamonas granuli NBRC 101663: 0.08%
Acidovorax temperans str. KY4: 7.55%
Acidovorax sp. NO-1: 3.12%
Acidovorax defluvii str. DSM 12644: 0.59%
Acidovorax soli str. DSM 25157: 0.5%
Malikia spinosa str. 83: 5.68%
Malikia granosa str. P1: 1.92%
Limnohabitans sp. Hippo3: 1.11%
Limnohabitans curvus str. MWH-C5: 0.16%
Hydrogenophaga sp. IBVHS2: 0.83%
Simplicispira lacusdiani str. CPCC 100842: 0.29%
Comamonadaceae bacterium B 24745 Branch: 0.14%
Alicycliphilus denitrificans 25093 Branch: 0.1%
Diaphorobacter sp. J5-51: 0.07%
Comamonadaceae bacterium 2PF: 0.07%
Aquabacterium olei str. NBRC 110486: 1.25%
Aquabacterium parvum str. B6: 0.31%
Aquabacterium commune str. DSM 11901: 0.08%
Azospira oryzae PS: 2.6%
Azospira sp. I09: 2.53%
Aromatoleum tolulyticum str. ATCC 51758: 0.24%
Dechloromonas hortensis str. MA-1: 1.28%
Dechloromonas sp. CZR5: 0.21%
Dechloromonas aromatica RCB: 0.16%
Dechloromonas agitata is5: 0.15%
Methyloversatilis discipulorum str. RZ18-153: 0.89%
Methyloversatilis universalis 13791 Branch: 0.1%
Pseudomonas chloritidismutans AW-1: 1.34%
Pseudomonas stutzeri CCUG 29243: 1.23%
Pseudomonas xanthomarina str. S11: 1.44%
Pseudomonas sp. ALS1279: 1.82%
Rhizobium sp. MSSRF QS100 str. SLBN-2: 1.48%
Pseudomonas alcaligenes NBRC 14159: 1.43%
Pseudomonas aeruginosa 38796 Branch: 0.8%
Pseudomonas alcaliphila JAB1: 1.84%
Pseudomonas chengduensis str. EGD-AQ5: 0.92%
Pseudomonas toyotomiensis str. KF710: 0.78%
Pseudomonas indoloxydans str. JCM 14246: 0.51%
Pseudomonas peli str. DSM 17833: 0.11%
Acinetobacter junii 41993 Branch: 0.49%
Acinetobacter lwoffii WJ10621: 0.34%
Acinetobacter sp. CIP 51.11: 0.33%
Acinetobacter idrijaensis str. MII: 0.26%
Acinetobacter johnsonii SH046: 0.24%
Alishewanella sp. HH-ZS: 0.64%
Alishewanella aestuarii B11: 0.5%
Alishewanella jeotgali KCTC 22429: 0.49%

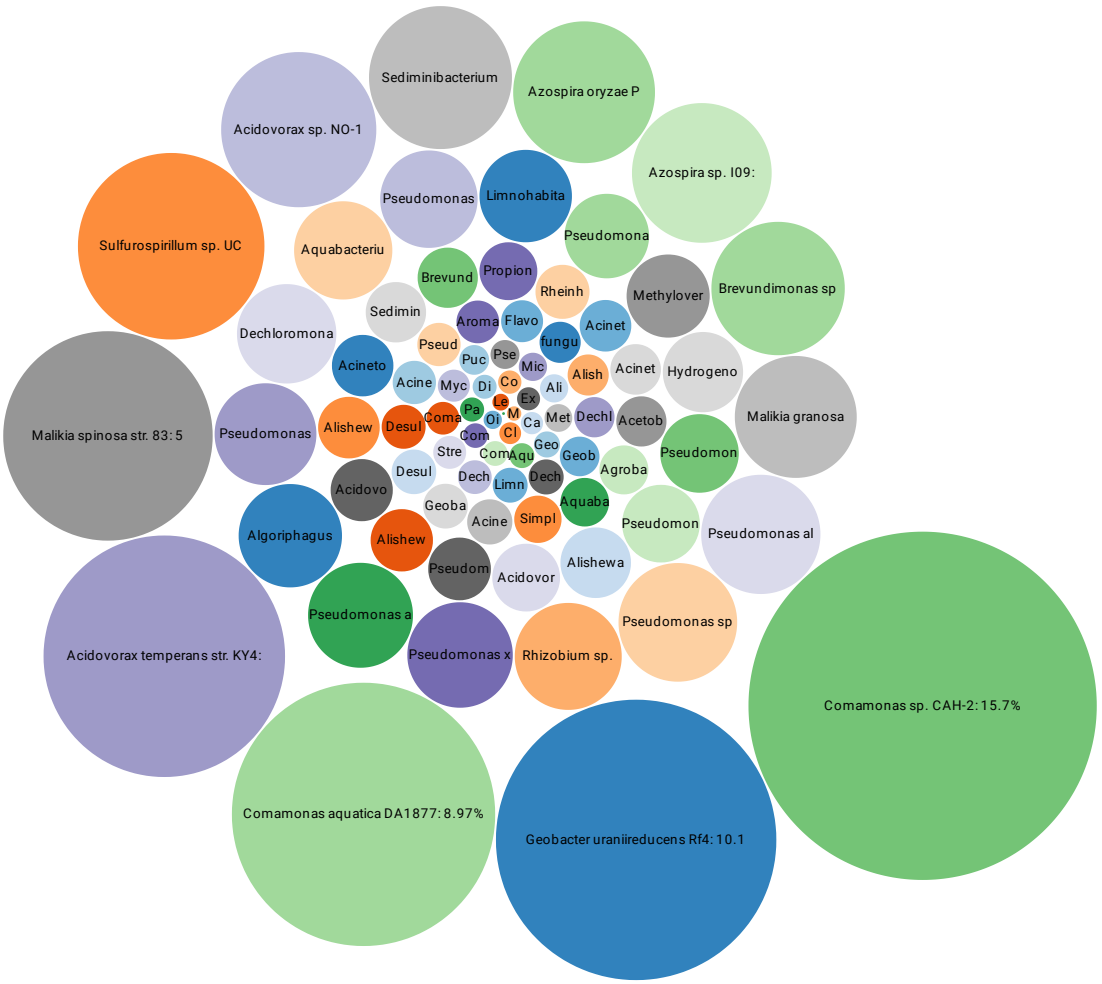

Alishewanella agri BL06: 0.22%
Rheinheimera tangshanensis str. JA3-B52: 0.38%
Pararheinheimera mesophila str. IITR-13: 0.08%
Geobacter uraniireducens Rf4: 10.18%
Geobacter 25953 Branch: 0.26%
Geobacter lovleyi SZ: 0.2%
Geobacter thiogenes str. ATCC BAA-34: 0.09%
Desulfomicrobium 36832 Branch: 0.26%
Desulforegula conservatrix Mb1Pa: 0.25%
Sulfurospirillum sp. UCH001: 4.5%
Brevundimonas sp. Bb-A: 2.3%
Brevundimonas fluminis str. LA-55: 0.47%
Agrobacterium sp. RAC06: 0.31%
Sediminibacterium salmoneum NBRC 103935: 2.65%
Sediminibacterium sp. C3: 0.47%
Algoriphagus aquaeductus str. T4: 1.38%
Flavobacterium sasangense DSM 21067: 0.23%
Propionibacterium 20955 Branch: 0.43%
Mycolicibacterium doricum str. DSM 44339: 0.13%
Microbacterium chocolatum str. SIT 101: 0.1%
Acetobacterium dehalogenans DSM 11527: 0.33%
Streptococcus thermophilus 2097 Branch: 0.14%
Exiguobacterium 13282 Branch: 0.07%
Cantharellus 2086 Branch: 0.06%
Lentinus polychrous str. BCC7694: 0.04%
Clavaria fumosa: 0.06%
Puccinia arachidis str. MRf11: 0.11%
Malassezia restricta str. KCTC 27527: 0.03%
fungus2008 1032 3007 Branch: 0.22%
Oidium heveae str. HO-73: 0.04%
Pseudoperonospora cubensis isolate MSU-1: 0.24%
Ralstonia virus RSA1: <0.01%

Radial Tree Chart



Sunburst Chart



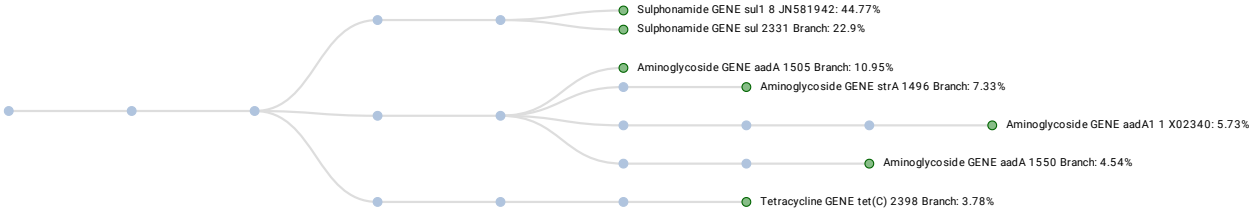

Sediminibacterium
Azospira oryzae P
Acidovorax sp. NO-1
Azospira sp. I09:
Pseudomonas
Limnohabita
Sulfurospirillum sp. UC
Pseudomona
Aquabacteriu
Brevundimonas sp
Brevund
Propion
Rheinh
Methylover
Sedimin
Dechloromona
Aroma
Flavo
Acinet
fungu
Pseud
Puc
Pse
Mic
Alish
Acinet
Hydrogeno
Acineto
Acine
Myc
Di
Co
Ali
Malikia granosa
Malikia spinosa str. 83: 5
Pseudomonas
Alishew
Desul
Coma
Pa
Le
Ex
Oi
M
Ca
Met
Dechl
Acetob
Com
Cl
Geo
Pseudomon
Stre
Com
Aqu
Geob
Agroba
Desul
Dech
Limn
Dech
Acidovo
Aquaba
Geoba
Acine
Simpl
Pseudomon
Pseudomonas al
Algoriphagus
Alishew
Alishewa
Pseudom
Acidovor
Pseudomonas a
Pseudomonas sp
Acidovorax temperans str. KY4:
Pseudomonas x
Rhizobium sp.
Comamonas sp. CAH-2: 15.7%
Comamonas aquatica DA1877: 8.97%
Geobacter uraniireducens Rf4: 10.1

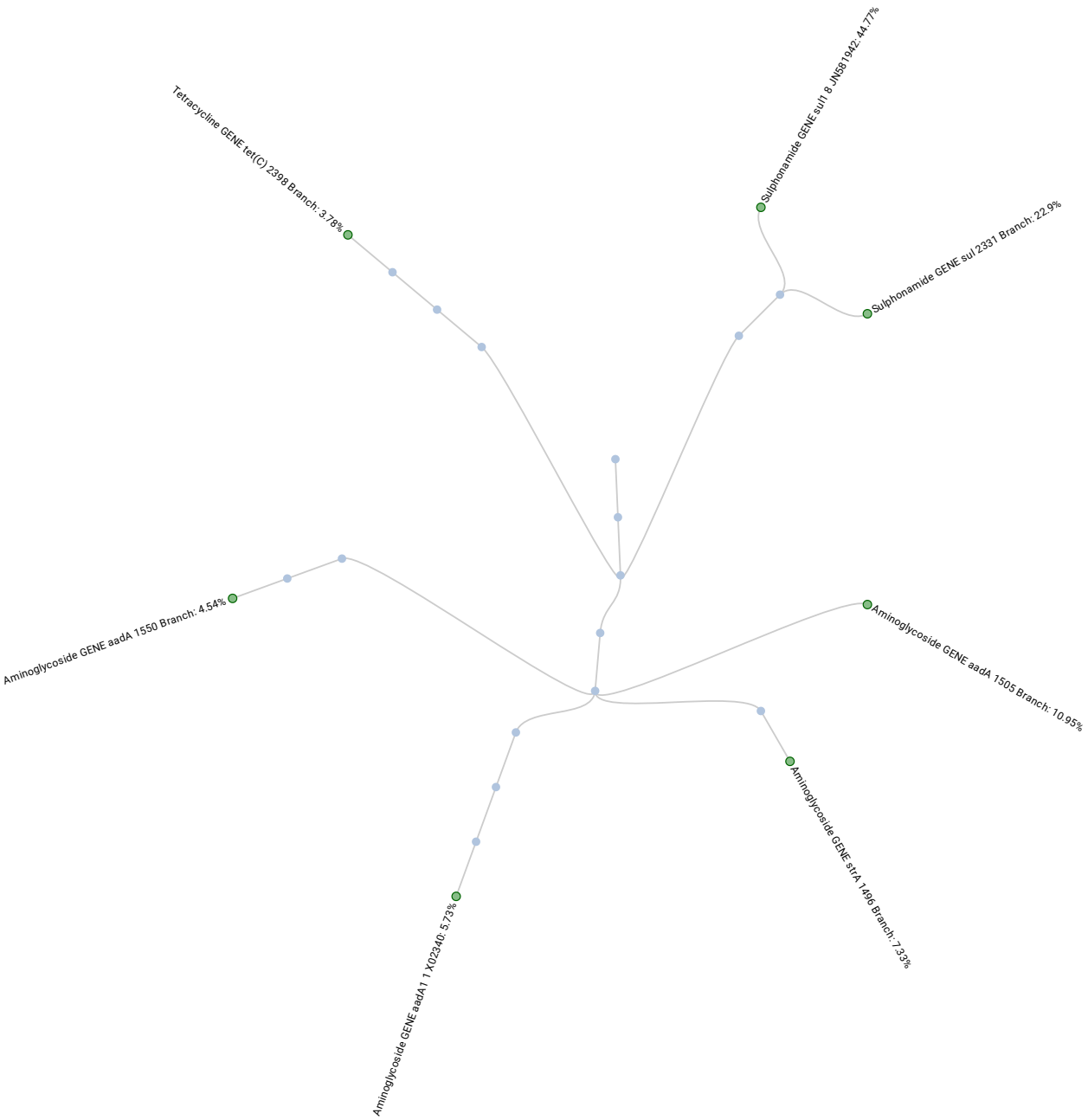
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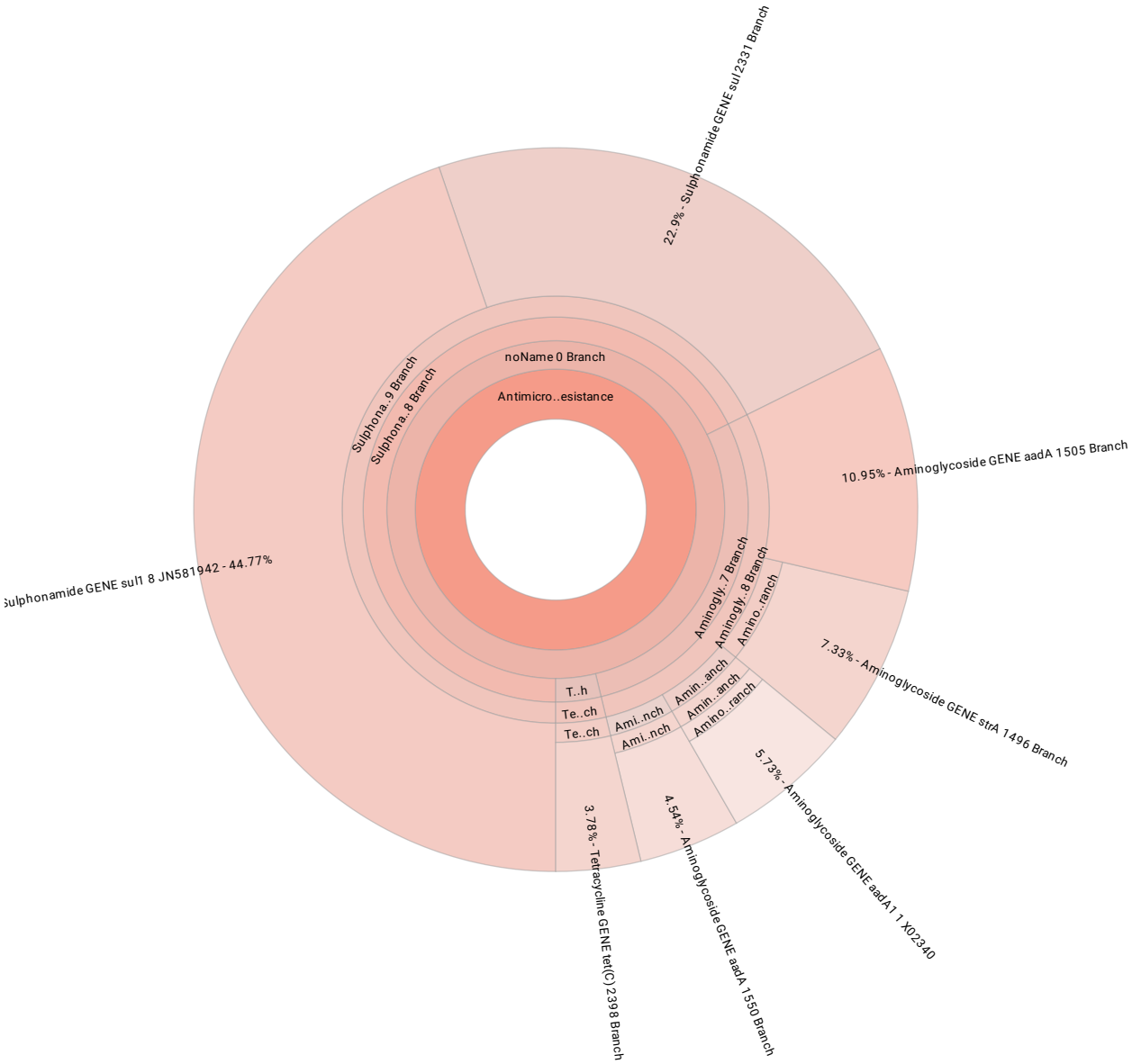
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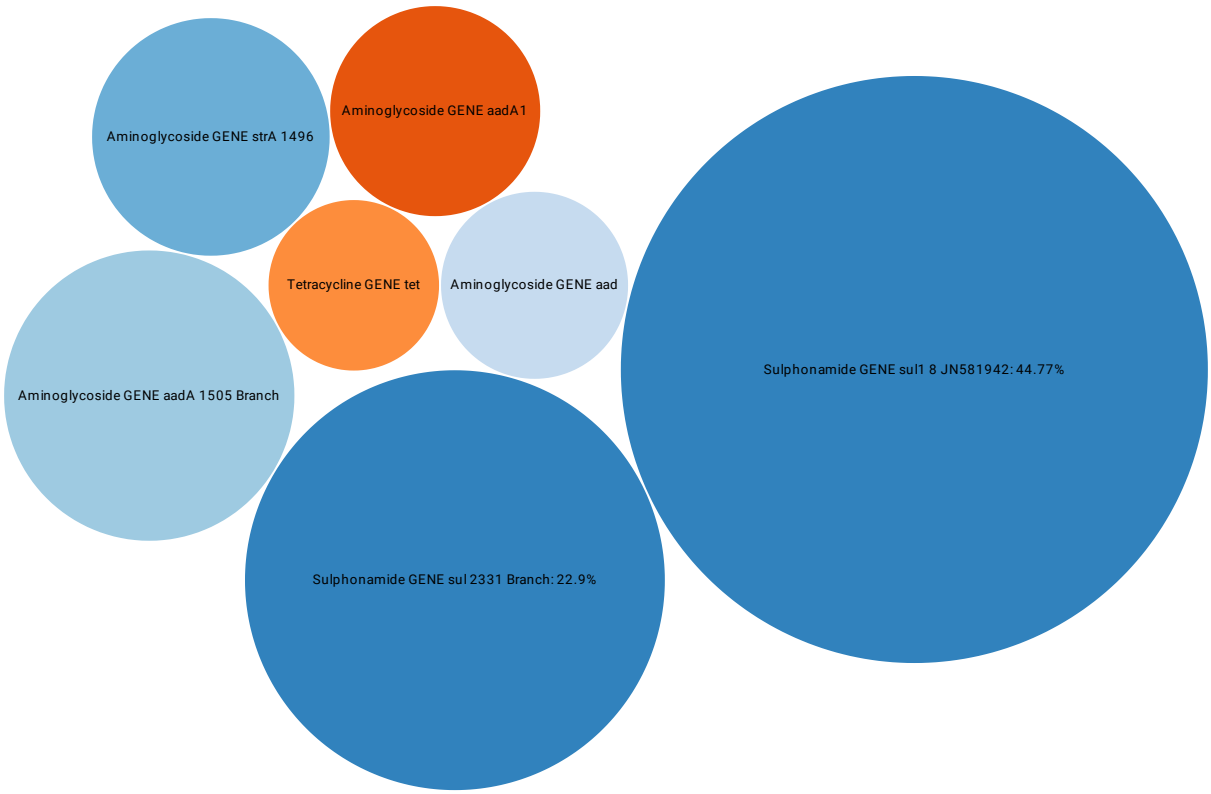
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Name	Accession ID	Class	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Sulphonamide GENE sul1 8 JN581942	JN581942	Sulfonamides_Trimethoprim	10057.91	44.77%	100.00	100.00	79
Sulphonamide GENE sul 2331 Branch	-	Sulfonamides_Trimethoprim	5144.8	22.90%	62.96	62.96	103
Aminoglycoside GENE aadA 1505 Branch	-	Aminoglycoside	2459.45	10.95%	46.48	46.48	33
Aminoglycoside GENE strA 1496 Branch	-	Aminoglycoside	1647.23	7.33%	100.00	34.56	14
Aminoglycoside GENE aadA1 1 X02340	X02340	Aminoglycoside	1287.57	5.73%	35.94	10.36	233
Aminoglycoside GENE aadA 1550 Branch	-	Aminoglycoside	1020.81	4.54%	33.33	28.43	5
Tetracycline GENE tet(C) 2398 Branch	-	Tetracyclines	848.27	3.78%	19.79	18.63	37


Sulphonamide GENE sul1 8 JN581942: 44.77%
Sulphonamide GENE sul 2331 Branch: 22.9%
Aminoglycoside GENE aadA 1505 Branch: 10.95%
Aminoglycoside GENE strA 1496 Branch: 7.33%
Aminoglycoside GENE aadA1 1 X02340: 5.73%
Aminoglycoside GENE aadA 1550 Branch: 4.54%
Tetracycline GENE tet(C) 2398 Branch: 3.78%


Tetracycline GENE tet(C) 2398 Branch: 3.78%
Sulphonamide GENE sul1 8_JN581942: 44.77%
Sulphonamide GENE sul 2331 Branch: 22.9%
Aminoglycoside GENE aadA 1550 Branch: 4.54%
Aminoglycoside GENE aadA 1505 Branch: 10.95%
Aminoglycoside GENE strA 1496 Branch: 7.33%
Aminoglycoside GENE aadA1 1 X02340: 5.73%


22.9% - Sulphonamide GENE sul2331 Branch
10.95% - Aminoglycoside GENE aadA 1505 Branch
7.33% - Aminoglycoside GENE strA 1496 Branch
5.73% - Aminoglycoside GENE aadA1 1 X02340
4.54% - AminoglYcoside GENE aadA 1550 Branch
3.78% - Tetracycline GENE tet(C) 2398 Branch
ulphonamide GENE sul1 8 JN581942 - 44.77%
noName 0 Branch
Antimicro..esistance
Sulphona..9 Branch
Sulphona..8 Branch
Aminogly..7 Branch
Aminogly..8 Branch
Amino..ranch
Amin..anch
Amin..anch
Amino..ranch
Ami..nch
Ami..nch
T..h
Te..ch
Te..ch


Aminoglycoside GENE strA 1496
Aminoglycoside GENE aadA1
Tetracycline GENE tet
Aminoglycoside GENE aad
Aminoglycoside GENE aadA 1505 Branch
Sulphonamide GENE sul1 8 JN581942: 44.77%
Sulphonamide GENE sul 2331 Branch: 22.9%

Fasta/q details

Name	Value
Hit	3105

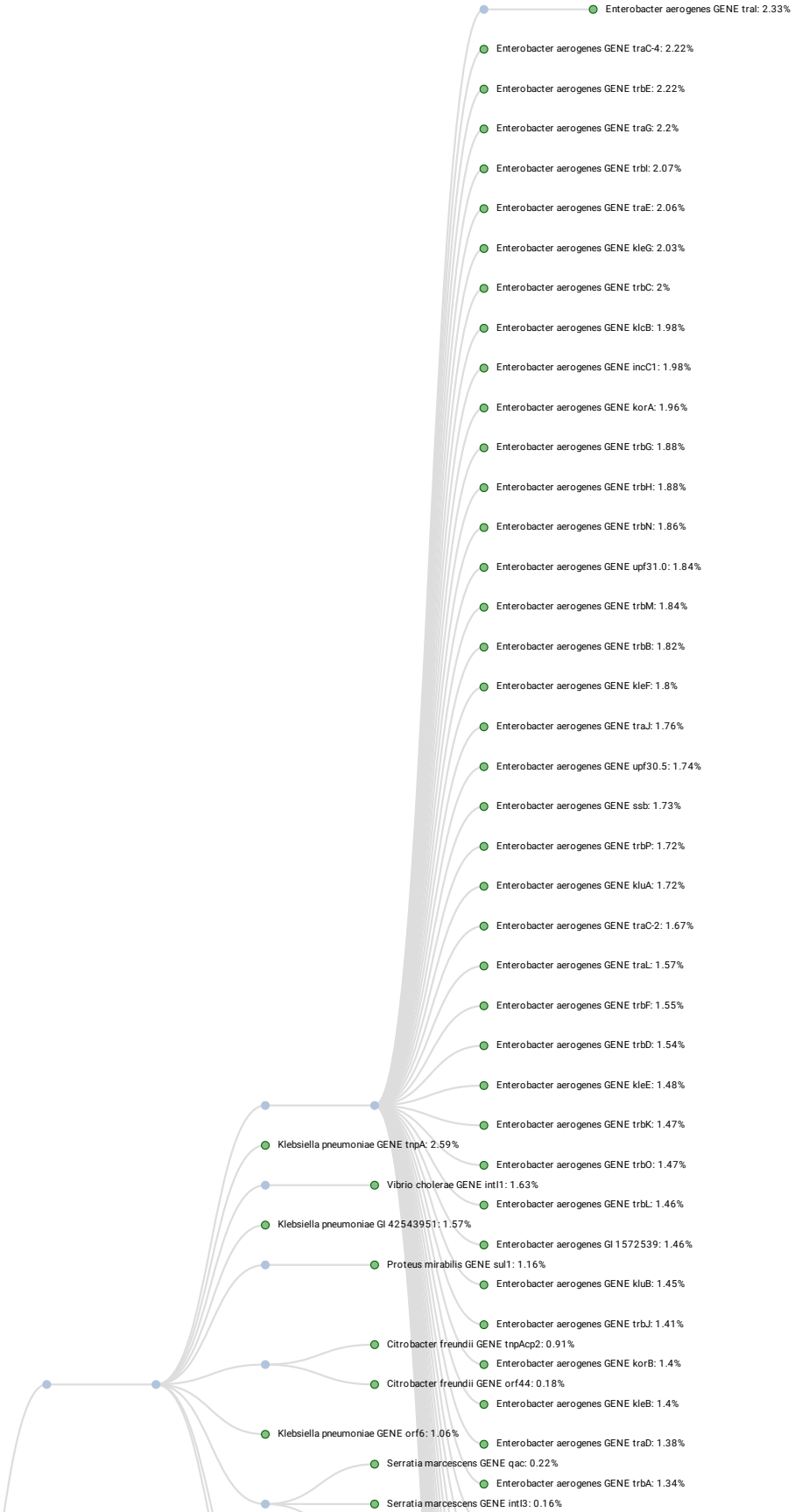
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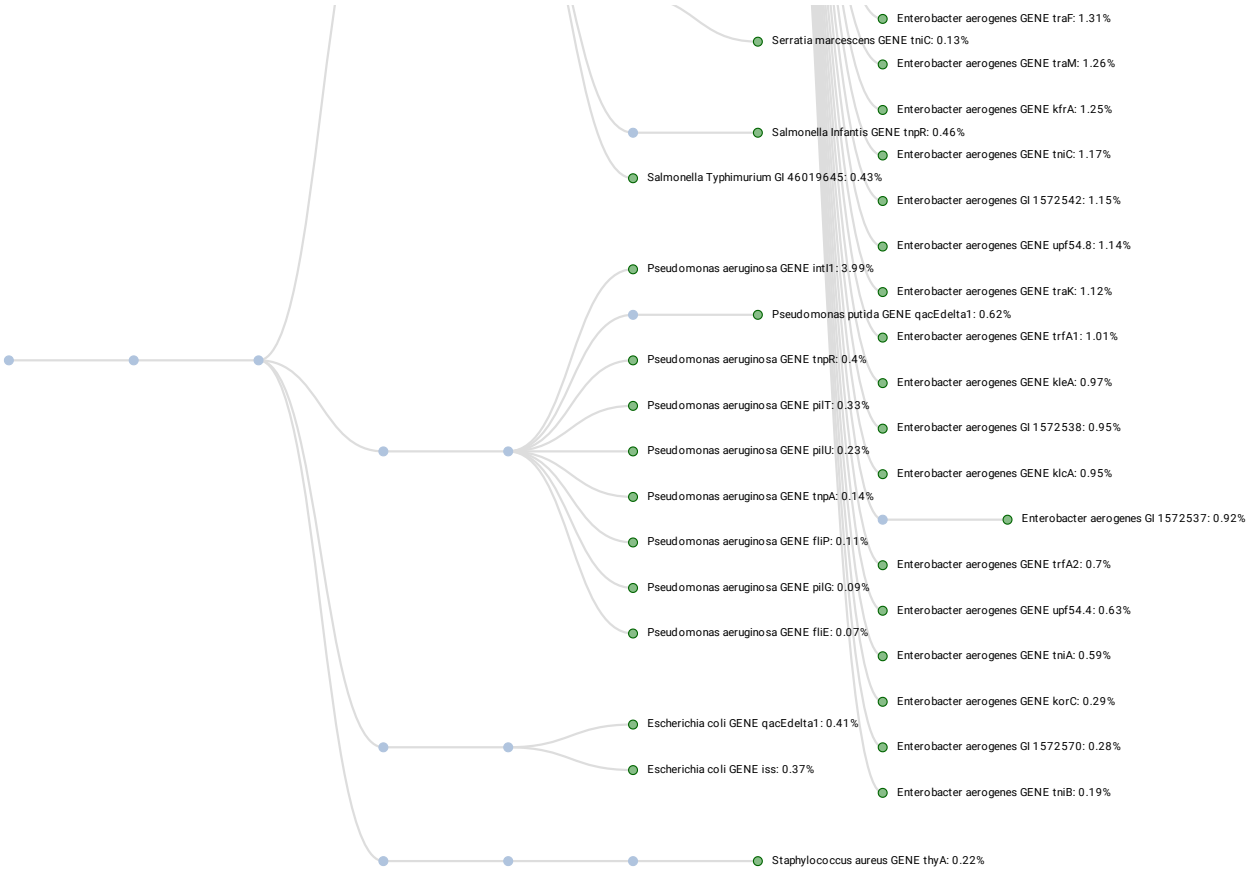
Name	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Pseudomonas aeruginosa GENE intI1	22791.6	3.99%	100.00	100.00	827
Klebsiella pneumoniae GENE tnpA	14826	2.59%	100.00	100.00	1595
Enterobacter aerogenes GENE traI	13305.56	2.33%	98.81	97.07	2898
Enterobacter aerogenes GENE traC-4	12717.02	2.22%	98.46	98.46	2368
Enterobacter aerogenes GENE trbE	12679.02	2.22%	94.72	94.72	3699
Enterobacter aerogenes GENE traG	12568.1	2.20%	98.26	98.26	2349
Enterobacter aerogenes GENE trbI	11847.53	2.07%	90.93	90.93	2075
Enterobacter aerogenes GENE traE	11805.05	2.06%	85.69	85.69	2864
Enterobacter aerogenes GENE kleG	11582.91	2.03%	100.00	100.00	448
Enterobacter aerogenes GENE trbC	11448.71	2.00%	77.08	77.08	700
Enterobacter aerogenes GENE klcB	11312.04	1.98%	93.71	93.71	1439
Enterobacter aerogenes GENE incC1	11292.35	1.98%	90.43	90.43	1245
Enterobacter aerogenes GENE korA	11224.33	1.96%	100.00	100.00	558
Enterobacter aerogenes GENE trbG	10757.01	1.88%	83.63	83.63	1206
Enterobacter aerogenes GENE trbH	10730.29	1.88%	90.68	90.68	695
Enterobacter aerogenes GENE trbN	10651.81	1.86%	95.33	95.33	797
Enterobacter aerogenes GENE upf31.0	10546.59	1.84%	94.03	94.03	729

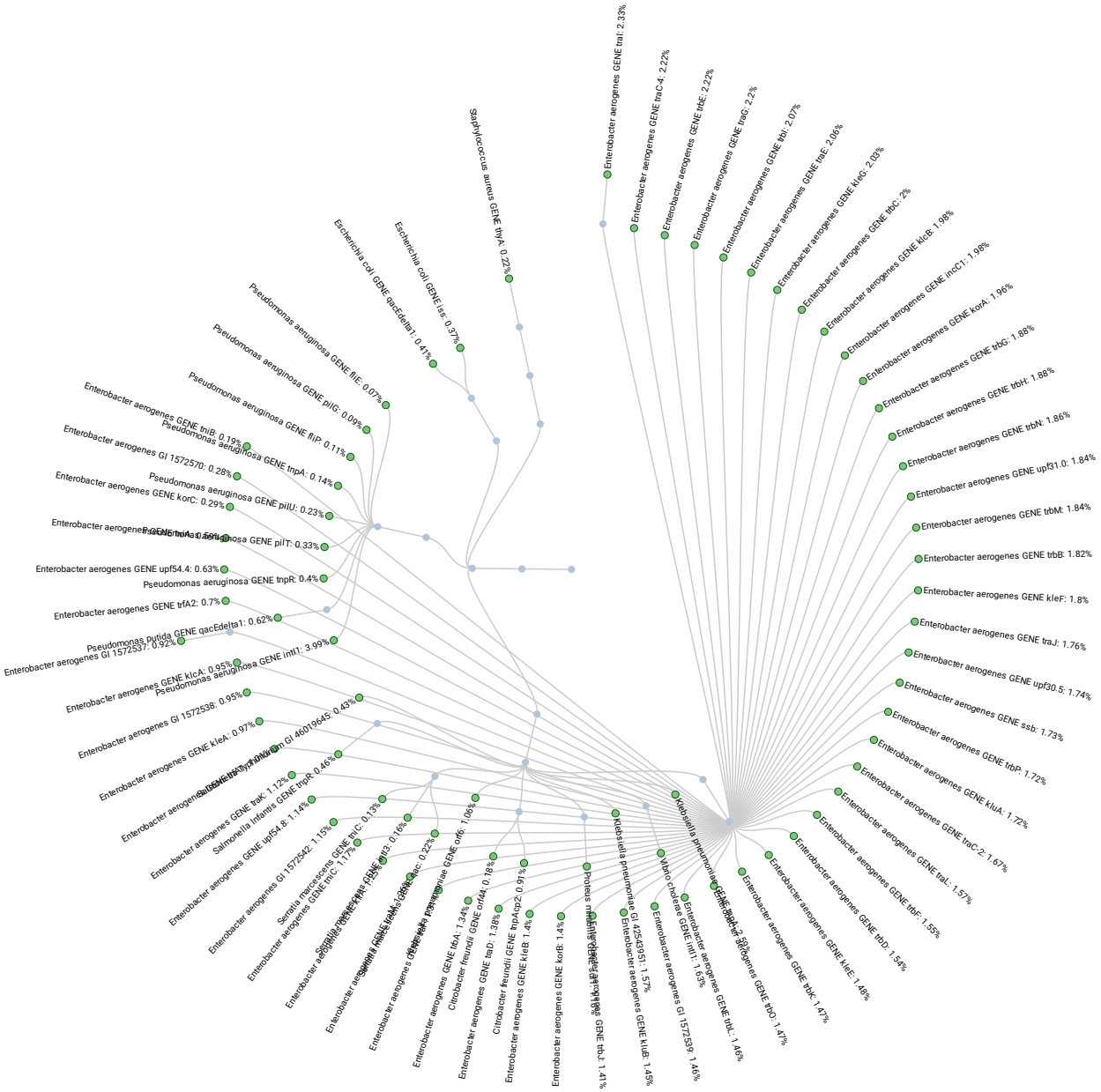
Name	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Enterobacter aerogenes GENE trbM	10512.63	1.84%	100.00	100.00	659
Enterobacter aerogenes GENE trbB	10403.55	1.82%	91.19	91.19	1323
Enterobacter aerogenes GENE kleF	10315.09	1.80%	100.00	100.00	406
Enterobacter aerogenes GENE traJ	10040.36	1.76%	97.09	97.09	546
Enterobacter aerogenes GENE upf30.5	9931.39	1.74%	92.52	92.52	572
Enterobacter aerogenes GENE ssb	9869.42	1.73%	100.00	100.00	502
Enterobacter aerogenes GENE trbP	9845.34	1.72%	97.01	97.01	864
Enterobacter aerogenes GENE kluA	9844.51	1.72%	100.00	100.00	432
Enterobacter aerogenes GENE traC-2	9534.59	1.67%	100.00	100.00	694
Vibrio cholerae GENE intI1	9297.16	1.63%	100.00	100.00	111
Klebsiella pneumoniae GI 42543951	8956.28	1.57%	100.00	100.00	70
Enterobacter aerogenes GENE traL	8948.01	1.57%	94.57	94.57	807
Enterobacter aerogenes GENE trbF	8839.08	1.55%	94.51	94.51	689
Enterobacter aerogenes GENE trbD	8797.59	1.54%	88.46	88.46	394
Enterobacter aerogenes GENE kleE	8443.97	1.48%	100.00	100.00	293
Enterobacter aerogenes GENE trbK	8433.57	1.47%	81.97	81.97	327
Enterobacter aerogenes GENE trbO	8394.29	1.47%	100.00	100.00	338
Enterobacter aerogenes GENE trbL	8336.08	1.46%	89.08	89.08	1045
Enterobacter aerogenes GI 1572539	8323.68	1.46%	100.00	100.00	143
Enterobacter aerogenes GENE kluB	8300.49	1.45%	100.00	100.00	343
Enterobacter aerogenes GENE trbJ	8034.49	1.41%	83.87	83.87	747
Enterobacter aerogenes GENE korB	8024.49	1.40%	87.12	87.12	823

Name	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Enterobacter aerogenes GENE kleB	7979.44	1.40%	95.24	95.24	277
Enterobacter aerogenes GENE traD	7885.18	1.38%	100.00	100.00	307
Enterobacter aerogenes GENE trbA	7635.65	1.34%	100.00	100.00	337
Enterobacter aerogenes GENE traF	7495.06	1.31%	88.61	88.61	501
Enterobacter aerogenes GENE traM	7229.65	1.26%	100.00	100.00	269
Enterobacter aerogenes GENE kfrA	7127.94	1.25%	88.41	88.41	591
Enterobacter aerogenes GENE tniC	6688.79	1.17%	72.78	72.78	552
Proteus mirabilis GENE sul1	6614.15	1.16%	80.30	80.30	248
Enterobacter aerogenes GI 1572542	6572.98	1.15%	46.01	46.01	1018
Enterobacter aerogenes GENE upf54.8	6537.44	1.14%	89.36	89.36	275
Enterobacter aerogenes GENE traK	6413.66	1.12%	96.77	96.77	236
Klebsiella pneumoniae GENE orf6	6076.34	1.06%	100.00	100.00	158
Enterobacter aerogenes GENE trfA1	5761.87	1.01%	96.43	96.43	177
Enterobacter aerogenes GENE kleA	5548.06	0.97%	100.00	100.00	126
Enterobacter aerogenes GI 1572538	5431.86	0.95%	100.00	100.00	68
Enterobacter aerogenes GENE klcA	5425.03	0.95%	86.60	86.60	201
Enterobacter aerogenes GI 1572537	5252.19	0.92%	100.00	100.00	38
Citrobacter freundii GENE tnpAcp2	5202.73	0.91%	56.13	56.13	830
Enterobacter aerogenes GENE trfA2	3980.7	0.70%	63.58	63.58	232
Enterobacter aerogenes GENE upf54.4	3607.5	0.63%	65.00	65.00	155
Pseudomonas putida GENE qacEdelta1	3564.5	0.62%	100.00	100.00	12
Enterobacter aerogenes GENE tniA	3388.52	0.59%	41.20	41.20	573

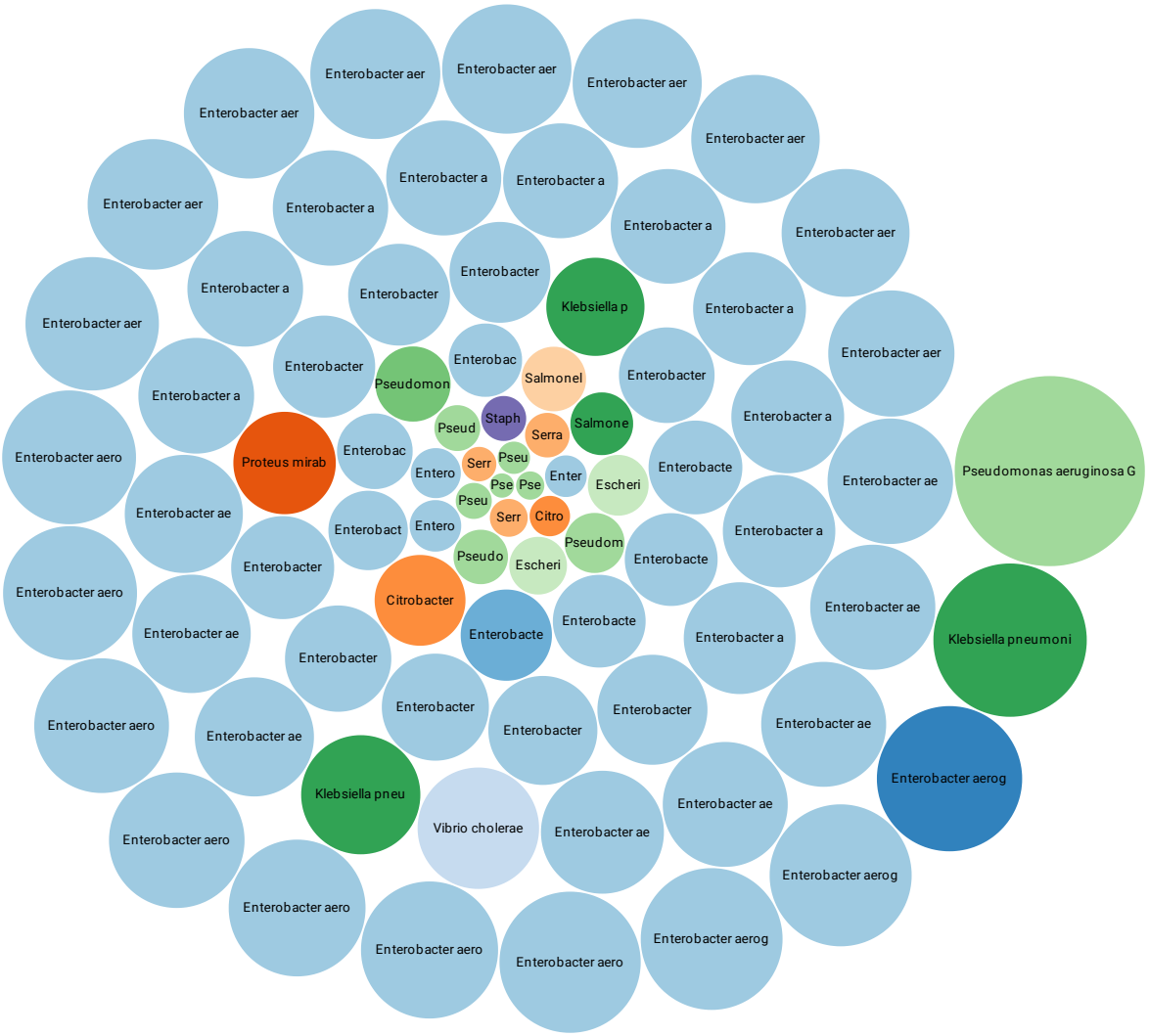
Name	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Salmonella Infantis GENE tnpR	2633.09	0.46%	49.00	49.00	108
Salmonella Typhimurium GI 46019645	2482.77	0.43%	28.12	28.12	419
Escherichia coli GENE qacEdelta1	2325.69	0.41%	67.57	67.57	25
Pseudomonas aeruginosa GENE tnpR	2276.84	0.40%	23.00	23.00	493
Escherichia coli GENE iss	2101	0.37%	23.81	23.81	471
Pseudomonas aeruginosa GENE pilT	1870.96	0.33%	33.57	33.57	159
Enterobacter aerogenes GENE korC	1675.49	0.29%	42.42	42.42	40
Enterobacter aerogenes GI 1572570	1577.47	0.28%	27.10	27.10	184
Pseudomonas aeruginosa GENE pilU	1326.31	0.23%	16.06	16.06	249
Staphylococcus aureus GENE thyA	1274.59	0.22%	25.00	25.00	131
Serratia marcescens GENE qac	1249.83	0.22%	33.33	33.33	34
Enterobacter aerogenes GENE tniB	1090.25	0.19%	21.39	21.39	90
Citrobacter freundii GENE orf44	1030.25	0.18%	23.60	23.60	63
Serratia marcescens GENE intI3	902.4	0.16%	19.31	19.31	76
Pseudomonas aeruginosa GENE tnpA	820.36	0.14%	12.38	12.38	423
Serratia marcescens GENE tniC	750.53	0.13%	10.61	10.61	54
Pseudomonas aeruginosa GENE fliP	660.04	0.11%	14.15	14.15	63
Pseudomonas aeruginosa GENE pilG	505.6	0.09%	10.48	10.48	46
Pseudomonas aeruginosa GENE fliE	369.85	0.07%	13.27	13.27	13


Enterobacter aerogenes GENE traI: 2.33%
Enterobacter aerogenes GENE traC-4: 2.22%
Enterobacter aerogenes GENE trbE: 2.22%
Enterobacter aerogenes GENE traG: 2.2%
Enterobacter aerogenes GENE trbI: 2.07%
Enterobacter aerogenes GENE traE: 2.06%
Enterobacter aerogenes GENE kleG: 2.03%
Enterobacter aerogenes GENE trbC: 2%
Enterobacter aerogenes GENE klcB: 1.98%
Enterobacter aerogenes GENE incC1: 1.98%
Enterobacter aerogenes GENE korA: 1.96%
Enterobacter aerogenes GENE trbG: 1.88%
Enterobacter aerogenes GENE trbH: 1.88%
Enterobacter aerogenes GENE trbN: 1.86%
Enterobacter aerogenes GENE upf31.0: 1.84%
Enterobacter aerogenes GENE trbM: 1.84%
Enterobacter aerogenes GENE trbB: 1.82%
Enterobacter aerogenes GENE kleF: 1.8%
Enterobacter aerogenes GENE traJ: 1.76%
Enterobacter aerogenes GENE upf30.5: 1.74%
Enterobacter aerogenes GENE ssb: 1.73%
Enterobacter aerogenes GENE trbP: 1.72%
Enterobacter aerogenes GENE kluA: 1.72%
Enterobacter aerogenes GENE traC-2: 1.67%
Enterobacter aerogenes GENE traL: 1.57%
Enterobacter aerogenes GENE trbF: 1.55%
Enterobacter aerogenes GENE trbD: 1.54%
Enterobacter aerogenes GENE kleE: 1.48%
Enterobacter aerogenes GENE trbK: 1.47%
Klebsiella pneumoniae GENE tnpA: 2.59%
Enterobacter aerogenes GENE trbO: 1.47%
Vibrio cholerae GENE intI1: 1.63%
Enterobacter aerogenes GENE trbL: 1.46%
Klebsiella pneumoniae GI 42543951: 1.57%
Enterobacter aerogenes GI 1572539: 1.46%
Proteus mirabilis GENE sul1: 1.16%
Enterobacter aerogenes GENE kluB: 1.45%
Enterobacter aerogenes GENE trbJ: 1.41%
Citrobacter freundii GENE tnpAcp2: 0.91%
Enterobacter aerogenes GENE korB: 1.4%
Citrobacter freundii GENE orf44: 0.18%
Enterobacter aerogenes GENE kleB: 1.4%
Klebsiella pneumoniae GENE orf6: 1.06%
Enterobacter aerogenes GENE traD: 1.38%
Serratia marcescens GENE qac: 0.22%
Enterobacter aerogenes GENE trbA: 1.34%
Serratia marcescens GENE intI3: 0.16%


Enterobacter aerogenes GENE traF: 1.31%
Serratia marcescens GENE tniC: 0.13%
Enterobacter aerogenes GENE traM: 1.26%
Enterobacter aerogenes GENE kfrA: 1.25%
Salmonella Infantis GENE tnpR: 0.46%
Enterobacter aerogenes GENE tniC: 1.17%
Salmonella Typhimurium GI 46019645: 0.43%
Enterobacter aerogenes GI 1572542: 1.15%
Enterobacter aerogenes GENE upf54.8: 1.14%
Pseudomonas aeruginosa GENE intI1: 3.99%
Enterobacter aerogenes GENE traK: 1.12%
Pseudomonas putida GENE qacEdelta1: 0.62%
Enterobacter aerogenes GENE trfA1: 1.01%
Pseudomonas aeruginosa GENE tnpR: 0.4%
Enterobacter aerogenes GENE kleA: 0.97%
Pseudomonas aeruginosa GENE pilT: 0.33%
Enterobacter aerogenes GI 1572538: 0.95%
Pseudomonas aeruginosa GENE pilU: 0.23%
Enterobacter aerogenes GENE klcA: 0.95%
Pseudomonas aeruginosa GENE tnpA: 0.14%
Enterobacter aerogenes GI 1572537: 0.92%
Pseudomonas aeruginosa GENE fliP: 0.11%
Enterobacter aerogenes GENE trfA2: 0.7%
Pseudomonas aeruginosa GENE pilG: 0.09%
Enterobacter aerogenes GENE upf54.4: 0.63%
Pseudomonas aeruginosa GENE fliE: 0.07%
Enterobacter aerogenes GENE tniA: 0.59%
Enterobacter aerogenes GENE korC: 0.29%
Escherichia coli GENE qacEdelta1: 0.41%
Enterobacter aerogenes GI 1572570: 0.28%
Escherichia coli GENE iss: 0.37%
Enterobacter aerogenes GENE tniB: 0.19%
Staphylococcus aureus GENE thyA: 0.22%


Enterobacter aerogenes GENE traI: 2.33%
Enterobacter aerogenes GENE traC-4: 2.22%
Enterobacter aerogenes GENE trbE: 2.22%
Enterobacter aerogenes GENE traG: 2.2%
Enterobacter aerogenes GENE traI: 2.07%
Enterobacter aerogenes GENE traE: 2.06%
Enterobacter aerogenes GENE klcG: 2.03%
Enterobacter aerogenes GENE traC: 2%
Enterobacter aerogenes GENE klcE: 1.98%
Enterobacter aerogenes GENE incC1: 1.98%
Enterobacter aerogenes GENE korA: 1.96%
Enterobacter aerogenes GENE trbG: 1.88%
Enterobacter aerogenes GENE trbH: 1.88%
Enterobacter aerogenes GENE trbN: 1.86%
Enterobacter aerogenes GENE upf31.0: 1.84%
Enterobacter aerogenes GENE trbM: 1.84%
Enterobacter aerogenes GENE trbB: 1.82%
Enterobacter aerogenes GENE kleF: 1.8%
Enterobacter aerogenes GENE traJ: 1.76%
Enterobacter aerogenes GENE upf30.5: 1.74%
Enterobacter aerogenes GENE ssb: 1.73%
Enterobacter aerogenes GENE trbP: 1.72%
Enterobacter aerogenes GENE kluA: 1.72%
Enterobacter aerogenes GENE traC-2: 1.67%
Enterobacter aerogenes GENE traL: 1.57%
Enterobacter aerogenes GENE trbF: 1.55%
Enterobacter aerogenes GENE traD: 1.54%
Enterobacter aerogenes GENE kleE: 1.48%
Enterobacter aerogenes GENE trbK: 1.47%
Enterobacter aerogenes GENE trbO: 1.47%
Enterobacter aerogenes GENE trbL: 1.46%
Enterobacter aerogenes GI 1572539: 1.46%
Enterobacter aerogenes GENE traF: 1.45%
Enterobacter aerogenes GENE traJ: 1.41%
Enterobacter aerogenes GENE korB: 1.4%
Citrobacter freundii GENE trpAgp2: 0.91%
Enterobacter aerogenes GENE klcB: 1.4%
Citrobacter freundii GENE orf44: 0.18%
Enterobacter aerogenes GENE traD: 1.38%
Enterobacter aerogenes GENE traA: 1.34%
Citrobacter freundii GENE orf6: 1.06%
Enterobacter aerogenes GENE traC: 0.22%
Enterobacter aerogenes GENE traG: 0.16%
Serratia marcescens GENE traC: 0.13%
Enterobacter aerogenes GENE traK: 1.17%
Salmonella Infantis GENE upf54.8: 1.14%
Enterobacter aerogenes GI 1572542: 1.15%
Enterobacter aerogenes GENE traK: 1.12%
Enterobacter aerogenes GENE tnpR: 0.46%
Enterobacter aerogenes GENE klcA: 0.95%
Enterobacter aerogenes GI 1572538: 0.95%
Enterobacter aerogenes GENE kleA: 0.97%
Enterobacter aerogenes GI 1572537: 0.92%
Pseudomonas putida GENE qacEdelta1: 0.62%
Enterobacter aerogenes GENE trfA2: 0.7%
Enterobacter aerogenes GENE upf54.4: 0.63%
Pseudomonas aeruginosa GENE tnpR: 0.4%
Pseudomonas aeruginosa GENE pilT: 0.33%
Enterobacter aerogenes GENE korC: 0.29%
Pseudomonas aeruginosa GENE pilU: 0.23%
Enterobacter aerogenes GI 1572570: 0.28%
Pseudomonas aeruginosa GENE tnpA: 0.14%
Enterobacter aerogenes GENE tnlB: 0.19%
Pseudomonas aeruginosa GENE pilG: 0.09%
Pseudomonas aeruginosa GENE pilP: 0.11%
Pseudomonas aeruginosa GENE fliE: 0.07%
Escherichia coli GENE qacEdelta1: 0.41%
Escherichia coli GENE ise: 0.97%
Staphylococcus aureus GENE ttyA: 0.22%
Pseudomonas aeruginosa GENE intI1: 3.99%
Enterobacter aerogenes GI 46019645: 0.43%
Klebsiella pneumoniae GENE traA: 2.22%
Vibrio cholerae GENE intI1: 1.63%
Enterobacter aerogenes GI 1572539: 1.46%
Enterobacter aerogenes GI 425495?1: 1.57%
Proteus mirabilis GENE intI1: 1.18%


Virulence Factors
noName 0 Branch
others 1998 Branch
others 0..9 Branch
Enteroba..2 Branch
Enteroba..0 Branch
Pseu..anch
E..h
1.54% - Enterobacter aerogenes GENE trbD
1.48% - Enterobacter aerogenes GENE kleE
1.47% - Enterobacter aerogenes GENE trbK
1.47% - Enterobacter aerogenes GENE trbO
1.46% - Enterobacter aerogenes GENE trbL
1.45% - Enterobacter aerogenes GI 1572539
1.41% - Enterobacter aerogenes GENE kluB
1.4% - Enterobacter aerogenes GENE trbJ
1.4% - Enterobacter aerogenes GENE korB
1.38% - Enterobacter aerogenes GENE kleB
1.34% - Enterobacter aerogenes GENE traD
1.31% - Enterobacter aerogenes GENE trbA
1.26% - Enterobacter aerogenes GENE traF
1.25% - Enterobacter aerogenes GENE traM
1.17% - Enterobacter aerogenes GENE kfrA
1.15% - Enterobacter aerogenes GENE tniC
1.14% - Enterobacter aerogenes GI 1572542
1.12% - Enterobacter aerogenes GENE upf54.8
1.01% - Enterobacter aerogenes GENE traK
10 more
2.59% - Klebsiella pneumoniae GENE tnpA
1.63% - Vibrio cholerae GENE intI1
1.57% - Klebsiella pneumoniae GI 42543951
1.16% - Proteus mirabilis GENE sul1
2 more
1.06% - Klebsiella pneumoniae GENE orf6
5 more
3.99% - Pseudomonas aeruginosa GENE intI1
8 more
Enterobacter aerogenes GENE traI - 2.33%
Enterobacter aerogenes GENE traC-4 - 2.22%
Enterobacter aerogenes GENE trbE - 2.22%
Enterobacter aerogenes GENE traG - 2.2%
Enterobacter aerogenes GENE trbI - 2.07%
Enterobacter aerogenes GENE traE - 2.06%
Enterobacter aerogenes GENE kleG - 2.03%
Enterobacter aerogenes GENE trbC - 2%
Enterobacter aerogenes GENE klcB - 1.98%
Enterobacter aerogenes GENE incC1 - 1.98%
Enterobacter aerogenes GENE korA - 1.96%
Enterobacter aerogenes GENE trbG - 1.88%
Enterobacter aerogenes GENE trbH - 1.88%
Enterobacter aerogenes GENE trbN - 1.86%
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Enterobacter aerogenes GENE trbM - 1.84%
Enterobacter aerogenes GENE trbB - 1.82%
Enterobacter aerogenes GENE kleF - 1.8%
Enterobacter aerogenes GENE traJ - 1.76%
Enterobacter aerogenes GENE upf30.5 - 1.74%
Enterobacter aerogenes GENE ssb - 1.73%
Enterobacter aerogenes GENE trbP - 1.72%
Enterobacter aerogenes GENE kluA - 1.72%
Enterobacter aerogenes GENE traC-2 - 1.67%
Enterobacter aerogenes GENE traL - 1.57%
Enterobacter aerogenes GENE trbF - 1.55%

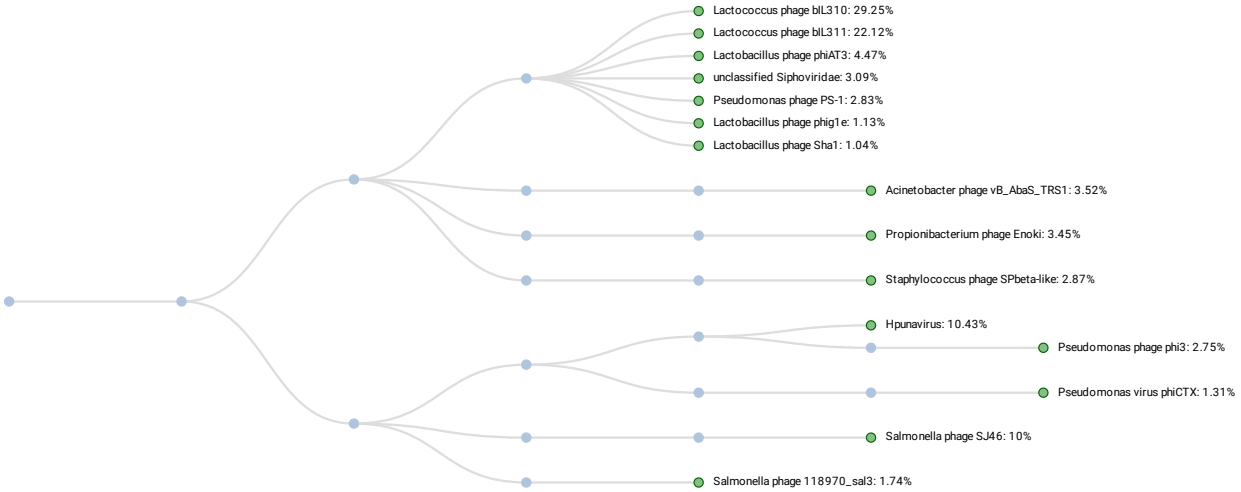

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Klebsiella p
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Enterobac
Salmonel
Enterobacter
Enterobacter a
Enterobacter a
Pseudomon
Staph
Salmone
Pseud
Serra
Enterobacter aero
Proteus mirab
Enterobac
Pseu
Serr
Entero
Enter
Pse
Pse
Escheri
Enterobacte
Enterobacter ae
Pseudomonas aeruginosa G
Enterobacter ae
Pseu
Enterobact
Entero
Serr
Citro
Enterobacter a
Enterobacter
Pseudom
Pseudo
Escheri
Enterobacte
Enterobacter aero
Citrobacter
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Enterobacter ae
Enterobacter ae
Enterobacter aerog
Klebsiella pneu
Vibrio cholerae
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Enterobacter aerog
Enterobacter aero
Enterobacter aero
Enterobacter aero
Enterobacter aerog

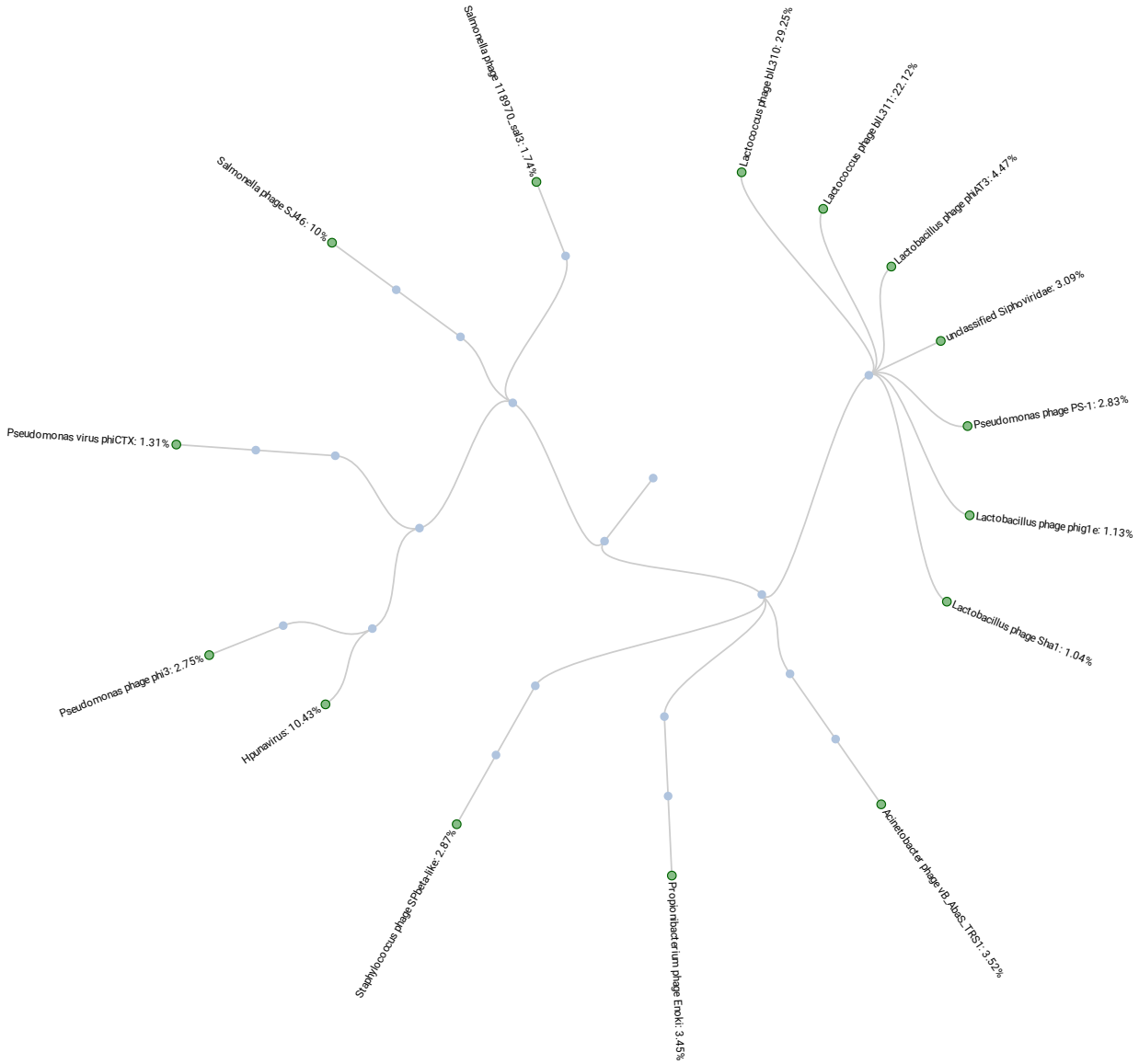
Fasta/q details

Name	Value
Hit	755

Table

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Lactococcus phage bIL310	151538	97.27	29.25%	1.88	1.86	559
Lactococcus phage bIL311	151534	73.57	22.12%	1.54	1.49	111
Hpunavirus	1196844	34.69	10.43%	0.17	0.17	242
Salmonella phage SJ46	1815968	33.26	10.00%	1.05	0.58	348
Lactobacillus phage phiAT3	279281	14.88	4.47%	0.35	0.30	55
Acinetobacter phage vB_AbaS_TRS1	1852629	11.7	3.52%	0.28	0.27	96
Propionibacterium phage Enoki	1654780	11.47	3.45%	0.42	0.31	12
unclassified Siphoviridae	196894	10.26	3.09%	0.21	0.12	40
Staphylococcus phage SPbeta-like	1732063	9.55	2.87%	0.19	0.19	124
Pseudomonas phage PS-1	1573458	9.42	2.83%	0.24	0.24	43
Pseudomonas phage phi3	1754217	9.16	2.75%	0.26	0.26	208
Salmonella phage 118970_sal3	1813771	5.79	1.74%	0.19	0.12	16
Pseudomonas virus phiCTX	35343	4.37	1.31%	0.12	0.12	28
Lactobacillus phage phig1e	52979	3.74	1.13%	0.11	0.11	32
Lactobacillus phage Sha1	947981	3.45	1.04%	0.10	0.10	34


Lactococcus phage bIL310: 29.25%
Lactococcus phage bIL311: 22.12%
Lactobacillus phage phiAT3: 4.47%
unclassified Siphoviridae: 3.09%
Pseudomonas phage PS-1: 2.83%
Lactobacillus phage phig1e: 1.13%
Lactobacillus phage Sha1: 1.04%
Acinetobacter phage vB_AbaS_TRS1: 3.52%
Propionibacterium phage Enoki: 3.45%
Staphylococcus phage SPbeta-like: 2.87%
Hpunavirus: 10.43%
Pseudomonas phage phi3: 2.75%
Pseudomonas virus phiCTX: 1.31%
Salmonella phage SJ46: 10%
Salmonella phage 118970_sal3: 1.74%

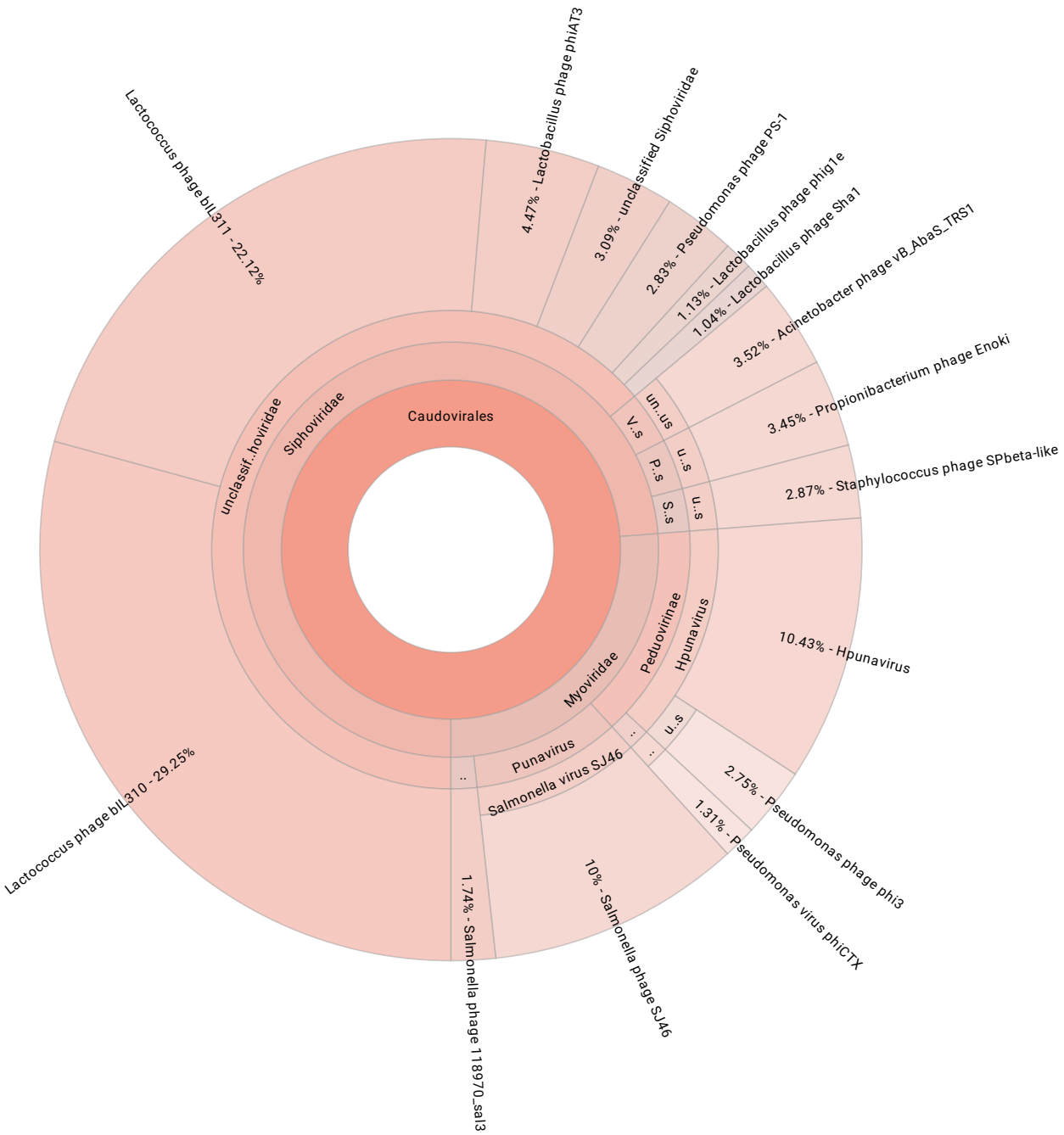

Salmonella phage 118970_sal3: 1.74%
Salmonella phage SJ46: 10%
Pseudomonas virus phiCTX: 1.31%
Pseudomonas phage phi3: 2.75%
Hpunavirus: 10.43%
Staphylococcus phage SPbeta-like: 2.87%
Propionibacterium phage Enoki: 3.45%
Acinetobacter phage vB_AbaS_TRS1: 3.52%
Lactococcus phage bIL310: 29.25%
Lactococcus phage bIL311: 22.12%
Lactobacillus phage phiAT3: 4.47%
unclassified Siphoviridae: 3.09%
Pseudomonas phage PS-1: 2.83%
Lactobacillus phage phig1e: 1.13%
Lactobacillus phage Sha1: 1.04%

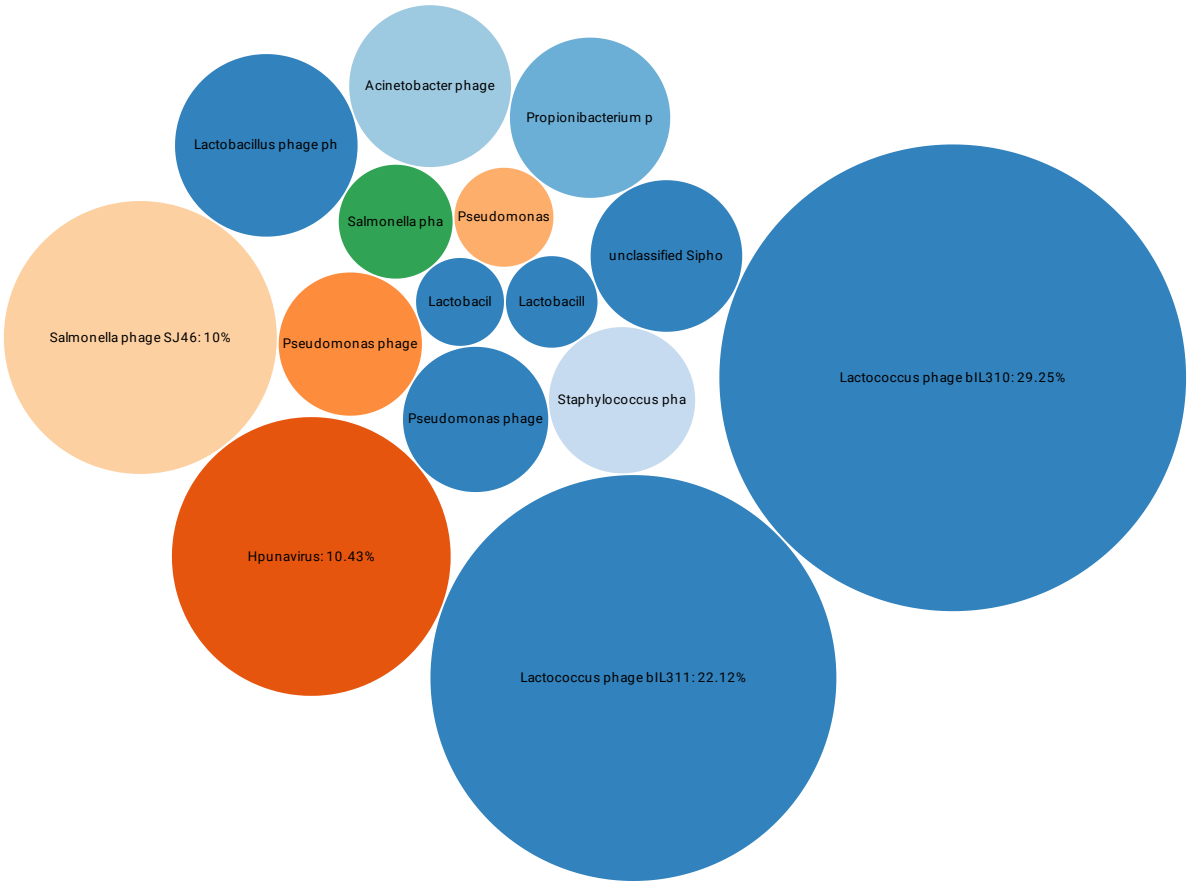
Phages

Sunburst Chart

Z3G106-02_CP05298

Filterset: Total




Acinetobacter phage
Propionibacterium p
Lactobacillus phage ph
Salmonella pha
Pseudomonas
unclassified Sipho
Lactobacil
Lactobacill
Salmonella phage SJ46: 10%
Pseudomonas phage
Lactococcus phage bIL310: 29.25%
Pseudomonas phage
Staphylococcus pha
Hpunavirus: 10.43%
Lactococcus phage bIL311: 22.12%

Fasta/q details

Name	Value
Hit	443785

Table

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Comamonas aquatica	225991	9234.89	25.26%	42.25	42.37	191329
Comamonadaceae bacterium	1871071	5045.06	13.80%	35.82	42.21	65695
Brevundimonas sp.	1871086	3618.08	9.90%	30.55	30.47	39731
Pseudomonas sp. UBA6718	1947334	1629.67	4.46%	14.88	15.13	20553
Deltaproteobacteria bacterium	2026735	1620.71	4.43%	15.29	15.29	14942
Caulobacteraceae bacterium UBA6225	1951540	1164.98	3.19%	7.57	10.02	10809
Acidovorax delafieldii	47920	1110.44	3.04%	7.62	7.98	29940
Acinetobacter sp. UBA3060	1945934	1040.37	2.85%	5.47	11.11	1189
Acidovorax sp.	1872122	971.02	2.66%	8.24	8.57	21954
Acinetobacter lwoffii	28090	702.65	1.92%	3.95	9.89	941
Alcanivorax sp. UBA2512	1945977	661.47	1.81%	18.42	9.73	340
Pseudomonas stutzeri	316	637.68	1.74%	5.61	5.13	1572
Caulobacteraceae bacterium UBA3608	1951538	585.46	1.60%	28.75	8.49	347
Caulobacteraceae bacterium UBA3198	1951537	582.99	1.60%	22.68	9.12	2471
Geobacter sp.	46610	456.74	1.25%	6.26	5.04	5073
Acinetobacter johnsonii	40214	414.18	1.13%	2.63	6.27	566
Cutibacterium acnes	1747	343.11	0.94%	2.22	4.09	133
Comamonas sp. UBA2122	1946390	291.02	0.80%	1.50	2.24	3735
Flavobacterium sp. UBA6195	1946554	279.07	0.76%	3.16	3.63	1307
Microbacterium sp.	51671	267.79	0.73%	2.99	2.99	4472
Acinetobacter junii	40215	261.5	0.72%	1.40	4.75	202
Pseudomonas mendocina	300	259.45	0.71%	2.24	2.85	5334
Desulfomicrobium sp. UBA5193	1961404	229.98	0.63%	2.54	2.60	3856
Pseudomonas kunmingensis	1211807	214.11	0.59%	3.21	3.33	223
Blastomonas sp. UBA7677	1946117	201.61	0.55%	2.50	2.50	1958
Aquabacterium sp. UBA666	1946043	198.21	0.54%	2.08	2.18	3439

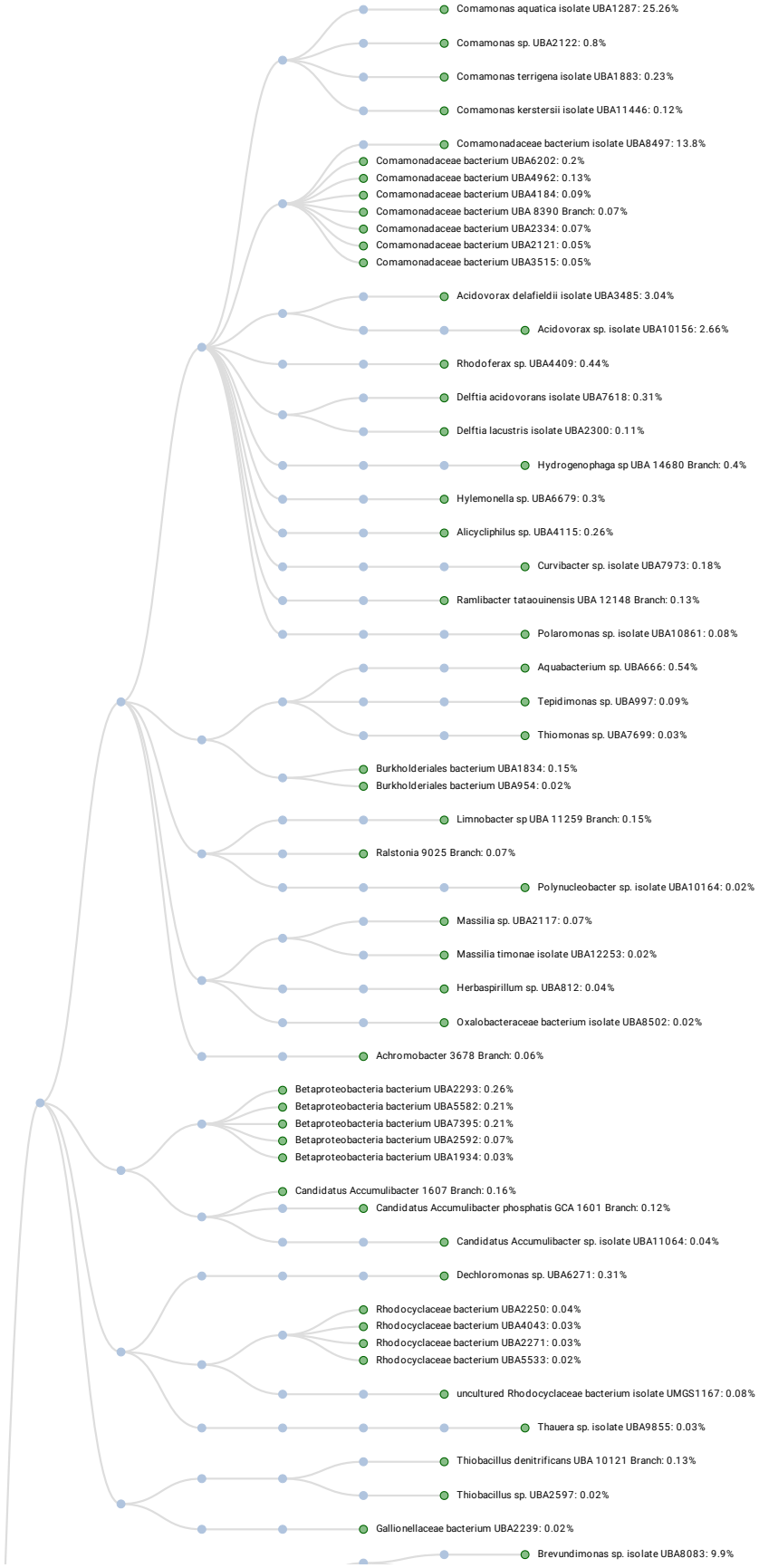
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Candidatus Omnitrophica bacterium	2035772	167.5	0.46%	2.37	2.37	683
Rhodoferax sp. UBA4409	1947378	162.03	0.44%	1.71	1.72	2994
Hydrogenophaga sp.	1904254	146.97	0.40%	0.77	0.77	2368
Acinetobacter nosocomialis	106654	134.91	0.37%	4.78	2.82	74
Gemmobacter sp.	1898957	133.84	0.37%	2.72	2.55	511
Xanthomonadaceae bacterium	1926873	121.65	0.33%	1.50	1.50	1566
Desulfovibrio sp. UBA6121	1961409	118.09	0.32%	1.37	1.37	2125
Rhodobacter sp.	1062	116.5	0.32%	1.50	1.50	1596
Delftia acidovorans	80866	113.34	0.31%	2.92	1.47	1266
Dechloromonas sp. UBA6271	1946404	111.37	0.31%	1.31	1.36	2049
Hylemonella sp. UBA6679	1946611	111.15	0.30%	1.30	1.30	1749
unclassified Geobacter	2627627	103.1	0.28%	0.16	0.16	181
unclassified Brevundimonas	2622653	98.25	0.27%	0.13	0.15	25
Betaproteobacteria bacterium UBA2293	1948454	95.74	0.26%	1.05	1.10	2321
Alicycliphilus sp. UBA4115	1946002	95.19	0.26%	1.05	1.28	658
unclassified Rhodanobacteraceae	1850978	93.87	0.26%	2.74	2.74	11
Comamonas terrigena	32013	85.19	0.23%	0.95	1.24	1748
Betaproteobacteria bacterium UBA5582	1948460	75.42	0.21%	0.81	1.04	1800
Betaproteobacteria bacterium UBA7395	1948463	75.15	0.21%	0.98	1.25	1079
Comamonadaceae bacterium UBA6202	1951611	74.26	0.20%	0.86	0.87	1684
Stenotrophomonas sp.	69392	70.46	0.19%	1.10	0.65	1085
Curvibacter sp.	1888168	66.42	0.18%	0.77	0.78	1605
Moraxellaceae bacterium	1889775	62.47	0.17%	0.77	0.77	1135
Candidatus Accumulibacter	327159	59.24	0.16%	0.65	0.65	13
Arenimonas sp.	1872635	57.01	0.16%	0.77	0.77	938
unclassified Limnobacter	2630203	54.98	0.15%	0.94	1.07	159
Burkholderiales bacterium UBA1834	1950768	54.17	0.15%	1.12	0.77	1804
Pseudomonas oleovorans	301	51.94	0.14%	0.77	1.10	428
Ramlibacter tataouinensis	94132	48.78	0.13%	0.31	0.31	883
Acetobacterium sp. UBA5834	1945907	46.78	0.13%	1.24	1.05	167

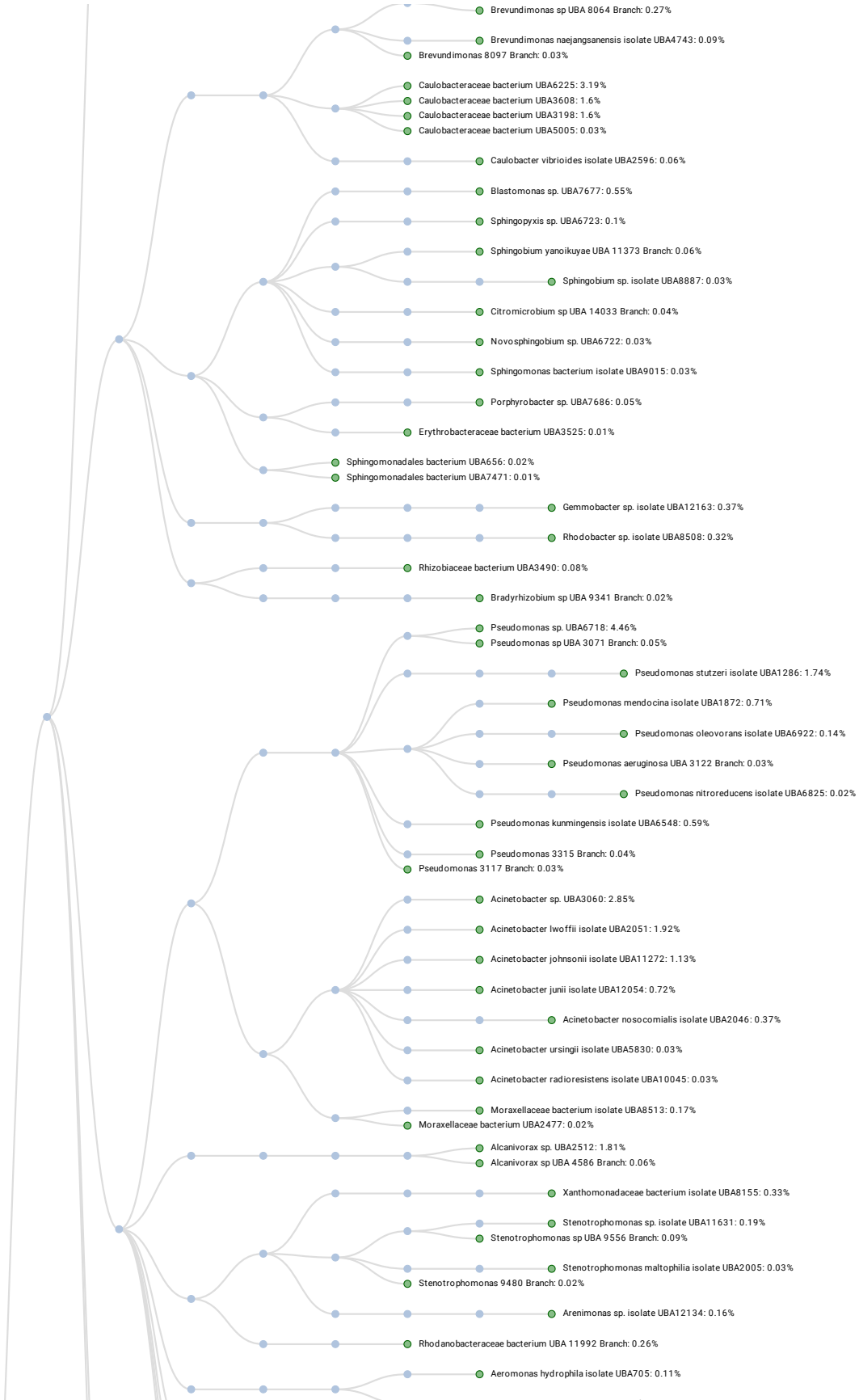
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Comamonadaceae bacterium UBA4962	1951608	46.58	0.13%	0.49	0.51	1788
Thiobacillus denitrificans	36861	45.96	0.13%	3.03	3.03	2
Candidatus Accumulibacter phosphatis	327160	45.42	0.12%	3.03	3.03	4
Comamonas kerstersii	225992	45.01	0.12%	0.43	0.48	1278
Aeromonas hydrophila	644	41.48	0.11%	0.60	0.64	640
Candidatus Omnitrophica bacterium UBA1562	1953262	39.49	0.11%	0.62	0.62	235
Delftia lacustris	558537	38.3	0.11%	0.47	0.96	933
Sphingopyxis sp. UBA6723	1947538	37.22	0.10%	0.93	0.99	42
Anaerolineaceae bacterium	2024896	35.34	0.10%	0.70	0.64	119
Tepidimonas sp. UBA997	1947650	33.7	0.09%	0.39	0.39	790
Comamonadaceae bacterium UBA4184	1951606	32.64	0.09%	0.50	0.49	4333
Brevundimonas naejangsanensis	588932	32.31	0.09%	0.59	0.71	329
unclassified Stenotrophomonas	196198	31.4	0.09%	0.16	0.16	30
Nitrospiraceae bacterium	2026770	31.55	0.09%	0.59	0.62	153
unclassified Algoriphagus	2641541	30.34	0.08%	0.11	0.11	15
Rhizobiaceae bacterium UBA3490	1953065	29.11	0.08%	0.41	0.41	747
Polaromonas sp.	1869339	28.96	0.08%	0.26	0.16	158
uncultured Rhodocyclaceae bacterium	151985	27.4	0.08%	0.38	0.40	617
unclassified Sulfurospirillum	2618290	27.58	0.08%	0.21	0.21	303
Betaproteobacteria bacterium UBA2592	1948455	26.27	0.07%	0.38	0.38	415
Dietzia sp.	1871616	25.88	0.07%	0.40	0.41	439
unclassified Comamonadaceae	83494	24.72	0.07%	0.33	0.33	277
Massilia sp. UBA2117	1946836	24.88	0.07%	0.41	0.64	267
Comamonadaceae bacterium UBA2334	1951601	24.36	0.07%	0.28	0.28	937
Ralstonia	48736	24.05	0.07%	0.36	0.36	34
uncultured Collinsella sp.	165190	23.97	0.07%	0.24	0.24	80
Sphingobium yanoikuyae	13690	22.41	0.06%	0.34	0.34	64
Lactobacillus plantarum	1590	22	0.06%	0.32	0.32	454

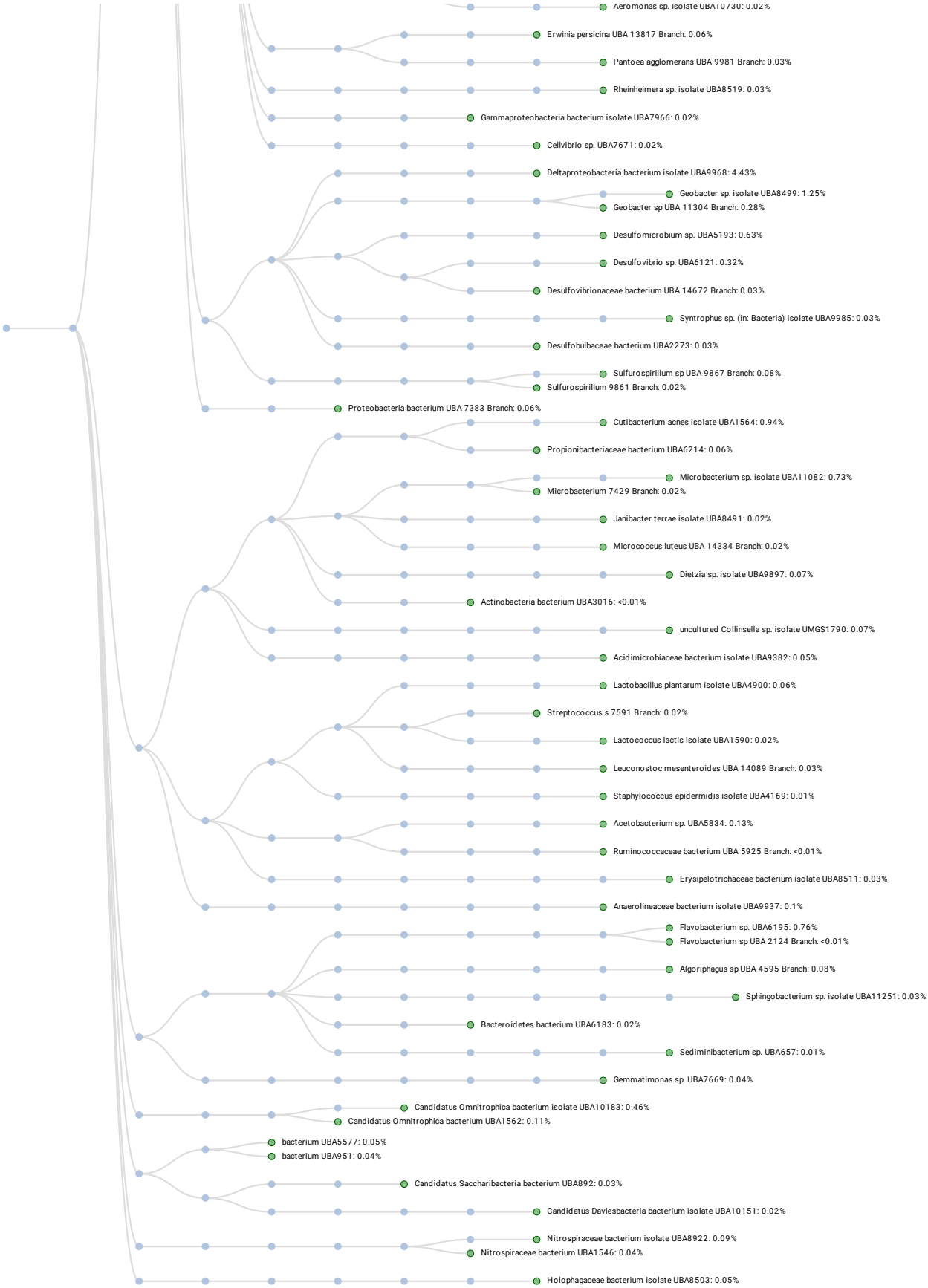
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Erwinia persicina	55211	21.41	0.06%	0.17	0.17	86
unclassified Proteobacteria (miscellaneous)	81684	21.47	0.06%	0.10	0.10	197
Caulobacter vibrioides	155892	21.31	0.06%	0.31	0.31	596
Propionibacteriaceae bacterium UBA6214	1952963	21.26	0.06%	0.34	0.34	360
Achromobacter	222	20.32	0.06%	0.22	0.22	62
unclassified Alcanivorax	2638842	20.14	0.06%	0.12	0.12	4
Comamonadaceae bacterium UBA2121	1951599	19.74	0.05%	0.19	0.26	918
unclassified Pseudomonas	2583993	19.73	0.05%	0.17	0.17	149
Porphyrobacter sp. UBA7686	1947080	19.46	0.05%	0.30	0.30	337
Acidimicrobiaceae bacterium	2024894	19.28	0.05%	0.29	0.29	524
Comamonadaceae bacterium UBA3515	1951605	19.08	0.05%	0.23	0.28	565
Holophagaceae bacterium	2052165	18.86	0.05%	0.32	0.32	261
bacterium UBA5577	1947808	18.86	0.05%	0.31	0.31	210
Rhodocyclaceae bacterium UBA2250	1952837	16.13	0.04%	0.24	0.51	382
Gemmatimonas sp. UBA7669	1946568	15.94	0.04%	0.25	0.25	412
Pseudomonas fluorescens group	136843	15.85	0.04%	0.21	0.17	118
Herbaspirillum sp. UBA812	1946590	15.26	0.04%	0.20	0.20	626
bacterium UBA951	1947788	15.41	0.04%	0.40	0.40	38
Candidatus Accumulibacter sp.	2053492	14.99	0.04%	0.18	0.18	677
unclassified Citromicrobium	2630544	14.4	0.04%	0.64	0.64	4
Nitrospiraceae bacterium UBA1546	1952975	14.26	0.04%	0.29	0.30	94
Thiomonas sp. UBA7699	1947694	12.33	0.03%	0.18	0.18	345
Betaproteobacteria bacterium UBA1934	1948453	12.53	0.03%	0.20	0.20	306
Acinetobacter ursingii	108980	12.43	0.03%	0.31	0.15	41
Acinetobacter radioresistens	40216	11.89	0.03%	0.41	0.35	21
Pseudomonas aeruginosa	287	12.04	0.03%	0.13	0.13	164
Novosphingobium sp. UBA6722	1946985	11.75	0.03%	0.20	0.21	196
Syntrophus sp. (in: Bacteria)	48412	11.6	0.03%	0.19	0.19	248
Thauera sp.	1905334	11.31	0.03%	0.17	0.20	302

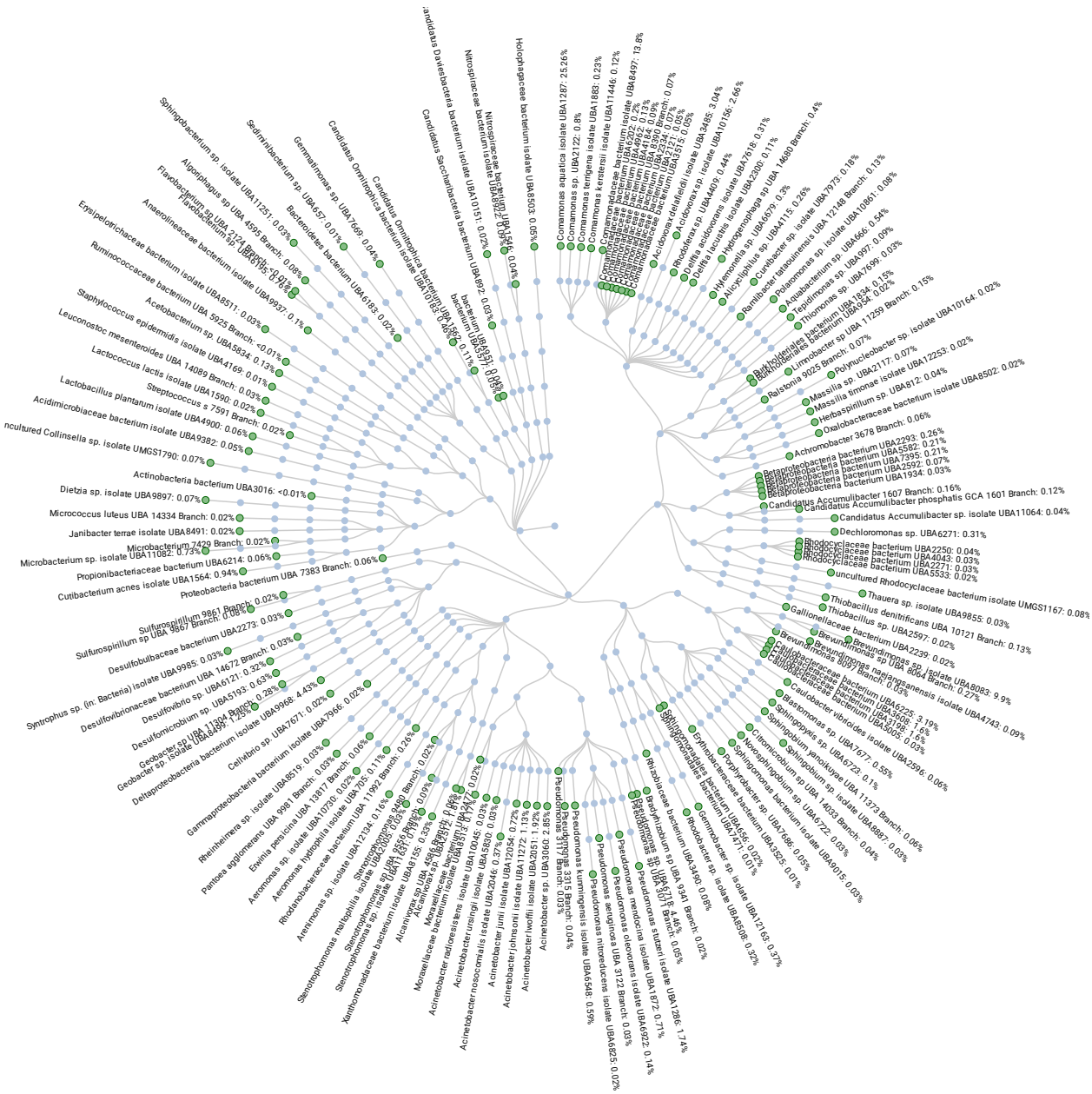
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Brevundimonas	41275	11.16	0.03%	0.19	0.19	20
Sphingobium sp.	1912891	11.35	0.03%	0.17	0.17	328
Stenotrophomonas maltophilia	40324	11.23	0.03%	0.23	0.13	75
Sphingobacterium sp.	341027	11.39	0.03%	0.41	0.32	13
Rhodocyclaceae bacterium UBA4043	1952842	10.95	0.03%	0.17	0.17	278
Candidatus Saccharibacteria bacterium UBA892	1953379	10.74	0.03%	0.25	0.25	54
Pseudomonas	286	10.23	0.03%	0.50	0.50	2
Rheinheimera sp.	1869214	10.36	0.03%	0.22	0.16	79
Sphingomonas bacterium	1895847	9.91	0.03%	0.17	0.18	225
Desulfobulbaceae bacterium UBA2273	1961547	9.82	0.03%	0.17	0.17	175
Pantoea agglomerans	549	9.78	0.03%	0.12	0.12	13
Rhodocyclaceae bacterium UBA2271	1952838	9.58	0.03%	0.21	0.23	47
Caulobacteraceae bacterium UBA5005	1951539	9.67	0.03%	0.16	0.16	243
unclassified Desulfovibrionaceae	231685	9.45	0.03%	0.13	0.14	38
Erysipelotrichaceae bacterium	2049044	9.58	0.03%	0.23	0.24	66
Leuconostoc mesenteroides	1245	9.29	0.03%	0.14	0.14	46
Gammaproteobacteria bacterium	1913989	8.63	0.02%	0.13	0.13	215
Streptococcus	1301	8.31	0.02%	0.21	0.21	14
Bacteroidetes bacterium UBA6183	1953166	8.56	0.02%	0.17	0.17	109
Oxalobacteraceae bacterium	1871070	8.13	0.02%	0.12	0.12	277
Stenotrophomonas	40323	8.1	0.02%	0.15	0.15	38
Polynucleobacter sp.	2029855	7.51	0.02%	0.17	0.17	67
Gallionellaceae bacterium UBA2239	1953084	7.78	0.02%	0.13	0.13	197
Rhodocyclaceae bacterium UBA5533	1952844	7.24	0.02%	0.11	0.11	281
Thiobacillus sp. UBA2597	1947687	7.3	0.02%	0.13	0.13	140
unclassified Bradyrhizobium	2631580	7.29	0.02%	0.17	0.17	34
Moraxellaceae bacterium UBA2477	1952265	7.48	0.02%	0.15	0.15	99
Pseudomonas nitroreducens	46680	7.38	0.02%	0.12	0.13	277

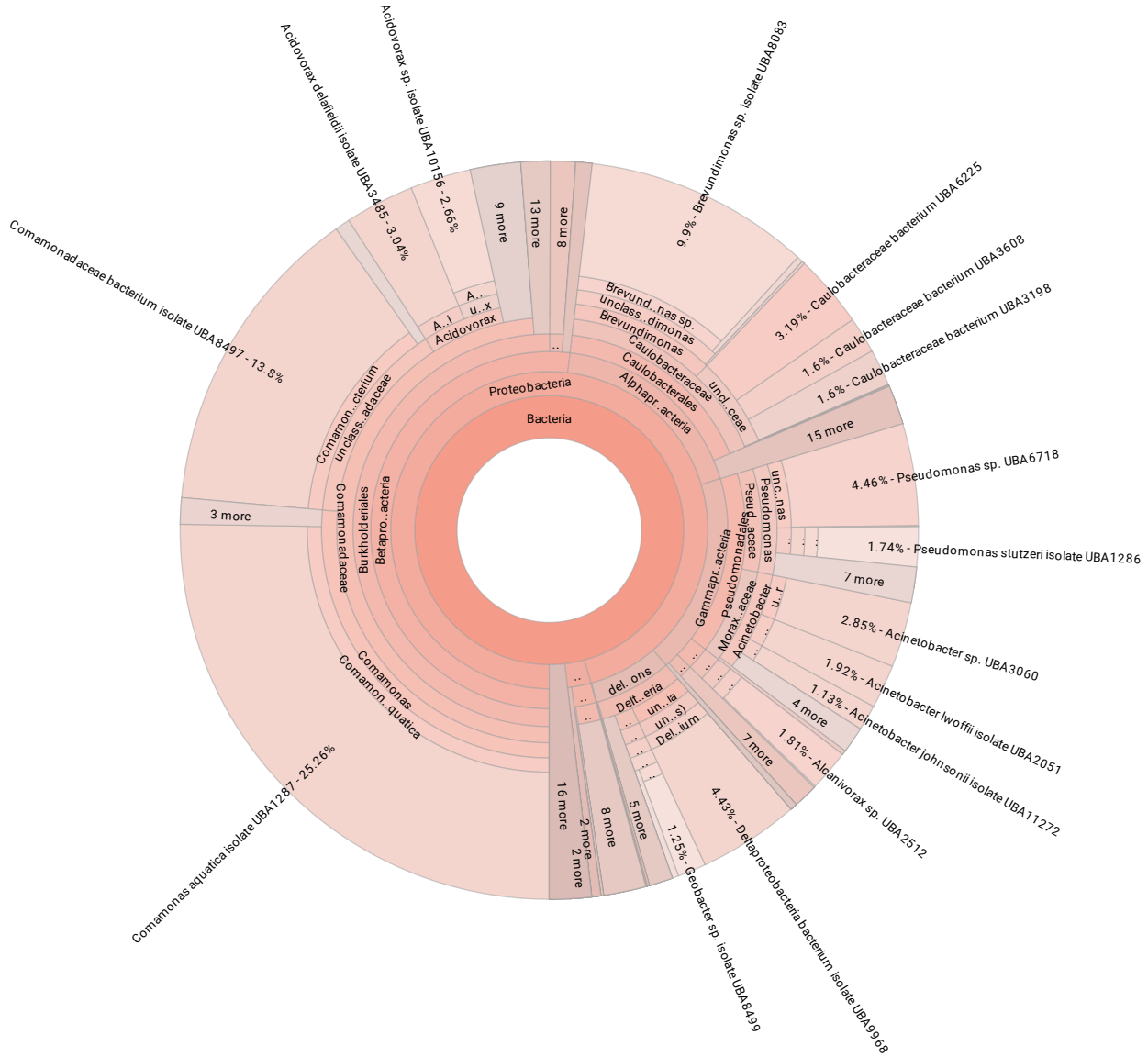
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Sphingomonadales bacterium UBA656	1951260	6.89	0.02%	0.15	0.15	102
Lactococcus lactis	1358	6.77	0.02%	0.20	0.15	24
Massilia timonae	47229	6.46	0.02%	0.22	0.13	15
Candidatus Daviesbacteria bacterium	2053542	6.22	0.02%	0.17	0.17	29
Sulfurospirillum	57665	5.95	0.02%	0.14	0.14	18
Aeromonas sp.	647	5.7	0.02%	0.11	0.15	104
Burkholderiales bacterium UBA954	1950782	5.45	0.02%	0.13	0.13	53
Cellvibrio sp. UBA7671	1946312	5.6	0.02%	0.11	0.11	113
Janibacter terrae	103817	5.59	0.02%	0.13	0.17	54
Micrococcus luteus	1270	5.66	0.02%	0.11	0.16	17
Microbacterium	33882	5.6	0.02%	0.12	0.12	14
Sediminibacterium sp. UBA657	1947456	5.15	0.01%	0.14	0.14	33
Sphingomonadales bacterium UBA7471	1951262	4.76	0.01%	0.10	0.12	79
Staphylococcus epidermidis	1282	4.38	0.01%	0.11	0.11	45
Erythrobacteraceae bacterium UBA3525	1951756	3.49	0.01%	0.16	0.18	8
Actinobacteria bacterium UBA3016	1948333	3.47	<0.01%	0.26	0.13	3
unclassified Flavobacterium	196869	2.31	<0.01%	0.12	0.12	3
unclassified Ruminococcaceae (miscellaneous)	2305133	1.74	<0.01%	0.19	0.19	2

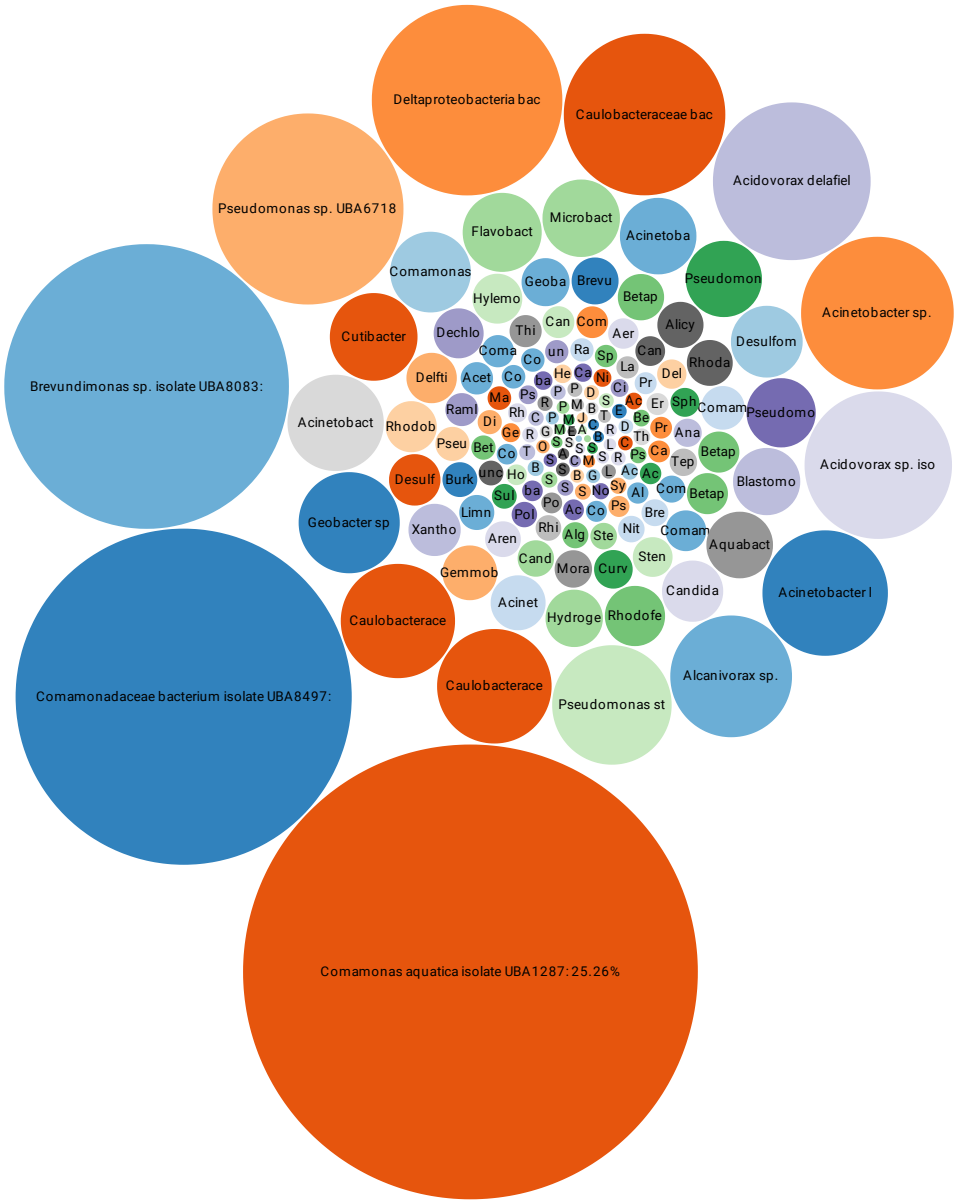

Comamonas aquatica isolate UBA1287: 25.26%
Comamonas sp. UBA2122: 0.8%
Comamonas terrigena isolate UBA1883: 0.23%
Comamonas kerstersii isolate UBA11446: 0.12%
Comamonadaceae bacterium isolate UBA8497: 13.8%
Comamonadaceae bacterium UBA6202: 0.2%
Comamonadaceae bacterium UBA4962: 0.13%
Comamonadaceae bacterium UBA4184: 0.09%
Comamonadaceae bacterium UBA 8390 Branch: 0.07%
Comamonadaceae bacterium UBA2334: 0.07%
Comamonadaceae bacterium UBA2121: 0.05%
Comamonadaceae bacterium UBA3515: 0.05%
Acidovorax delafieldii isolate UBA3485: 3.04%
Acidovorax sp. isolate UBA10156: 2.66%
Rhodoferax sp. UBA4409: 0.44%
Delftia acidovorans isolate UBA7618: 0.31%
Delftia lacustris isolate UBA2300: 0.11%
Hydrogenophaga sp UBA 14680 Branch: 0.4%
Hylemonella sp. UBA6679: 0.3%
Alicycliphilus sp. UBA4115: 0.26%
Curvibacter sp. isolate UBA7973: 0.18%
Ramlibacter tataouinensis UBA 12148 Branch: 0.13%
Polaromonas sp. isolate UBA10861: 0.08%
Aquabacterium sp. UBA666: 0.54%
Tepidimonas sp. UBA997: 0.09%
Thiomonas sp. UBA7699: 0.03%
Burkholderiales bacterium UBA1834: 0.15%
Burkholderiales bacterium UBA954: 0.02%
Limnobacter sp UBA 11259 Branch: 0.15%
Ralstonia 9025 Branch: 0.07%
Polynucleobacter sp. isolate UBA10164: 0.02%
Massilia sp. UBA2117: 0.07%
Massilia timonae isolate UBA12253: 0.02%
Herbaspirillum sp. UBA812: 0.04%
Oxalobacteraceae bacterium isolate UBA8502: 0.02%
Achromobacter 3678 Branch: 0.06%
Betaproteobacteria bacterium UBA2293: 0.26%
Betaproteobacteria bacterium UBA5582: 0.21%
Betaproteobacteria bacterium UBA7395: 0.21%
Betaproteobacteria bacterium UBA2592: 0.07%
Betaproteobacteria bacterium UBA1934: 0.03%
Candidatus Accumulibacter 1607 Branch: 0.16%
Candidatus Accumulibacter phosphatis GCA 1601 Branch: 0.12%
Candidatus Accumulibacter sp. isolate UBA11064: 0.04%
Dechloromonas sp. UBA6271: 0.31%
Rhodocyclaceae bacterium UBA2250: 0.04%
Rhodocyclaceae bacterium UBA4043: 0.03%
Rhodocyclaceae bacterium UBA2271: 0.03%
Rhodocyclaceae bacterium UBA5533: 0.02%
uncultured Rhodocyclaceae bacterium isolate UMGS1167: 0.08%
Thauera sp. isolate UBA9855: 0.03%
Thiobacillus denitrificans UBA 10121 Branch: 0.13%
Thiobacillus sp. UBA2597: 0.02%
Gallionellaceae bacterium UBA2239: 0.02%
Brevundimonas sp. isolate UBA8083: 9.9%


Brevundimonas sp UBA 8064 Branch: 0.27%
Brevundimonas naejangsanensis isolate UBA4743: 0.09%
Brevundimonas 8097 Branch: 0.03%
Caulobacteraceae bacterium UBA6225: 3.19%
Caulobacteraceae bacterium UBA3608: 1.6%
Caulobacteraceae bacterium UBA3198: 1.6%
Caulobacteraceae bacterium UBA5005: 0.03%
Caulobacter vibrioides isolate UBA2596: 0.06%
Blastomonas sp. UBA7677: 0.55%
Sphingopyxis sp. UBA6723: 0.1%
Sphingobium yanoikuyae UBA 11373 Branch: 0.06%
Sphingobium sp. isolate UBA8887: 0.03%
Citromicrobium sp UBA 14033 Branch: 0.04%
Novosphingobium sp. UBA6722: 0.03%
Sphingomonas bacterium isolate UBA9015: 0.03%
Porphyrobacter sp. UBA7686: 0.05%
Erythrobacteraceae bacterium UBA3525: 0.01%
Sphingomonadales bacterium UBA656: 0.02%
Sphingomonadales bacterium UBA7471: 0.01%
Gemmobacter sp. isolate UBA12163: 0.37%
Rhodobacter sp. isolate UBA8508: 0.32%
Rhizobiaceae bacterium UBA3490: 0.08%
Bradyrhizobium sp UBA 9341 Branch: 0.02%
Pseudomonas sp. UBA6718: 4.46%
Pseudomonas sp UBA 3071 Branch: 0.05%
Pseudomonas stutzeri isolate UBA1286: 1.74%
Pseudomonas mendocina isolate UBA1872: 0.71%
Pseudomonas oleovorans isolate UBA6922: 0.14%
Pseudomonas aeruginosa UBA 3122 Branch: 0.03%
Pseudomonas nitroreducens isolate UBA6825: 0.02%
Pseudomonas kunmingensis isolate UBA6548: 0.59%
Pseudomonas 3315 Branch: 0.04%
Pseudomonas 3117 Branch: 0.03%
Acinetobacter sp. UBA3060: 2.85%
Acinetobacter lwoffii isolate UBA2051: 1.92%
Acinetobacter johnsonii isolate UBA11272: 1.13%
Acinetobacter junii isolate UBA12054: 0.72%
Acinetobacter nosocomialis isolate UBA2046: 0.37%
Acinetobacter ursingii isolate UBA5830: 0.03%
Acinetobacter radioresistens isolate UBA10045: 0.03%
Moraxellaceae bacterium isolate UBA8513: 0.17%
Moraxellaceae bacterium UBA2477: 0.02%
Alcanivorax sp. UBA2512: 1.81%
Alcanivorax sp UBA 4586 Branch: 0.06%
Xanthomonadaceae bacterium isolate UBA8155: 0.33%
Stenotrophomonas sp. isolate UBA11631: 0.19%
Stenotrophomonas sp UBA 9556 Branch: 0.09%
Stenotrophomonas maltophilia isolate UBA2005: 0.03%
Stenotrophomonas 9480 Branch: 0.02%
Arenimonas sp. isolate UBA12134: 0.16%
Rhodanobacteraceae bacterium UBA 11992 Branch: 0.26%
Aeromonas hydrophila isolate UBA705: 0.11%


Aeromonas sp. isolate UBA10730: 0.02%
Erwinia persicina UBA 13817 Branch: 0.06%
Pantoea agglomerans UBA 9981 Branch: 0.03%
Rheinheimera sp. isolate UBA8519: 0.03%
Gammaproteobacteria bacterium isolate UBA7966: 0.02%
Cellvibrio sp. UBA7671: 0.02%
Deltaproteobacteria bacterium isolate UBA9968: 4.43%
Geobacter sp. isolate UBA8499: 1.25%
Geobacter sp UBA 11304 Branch: 0.28%
Desulfomicrobium sp. UBA5193: 0.63%
Desulfovibrio sp. UBA6121: 0.32%
Desulfovibrionaceae bacterium UBA 14672 Branch: 0.03%
Syntrophus sp. (in: Bacteria) isolate UBA9985: 0.03%
Desulfobulbaceae bacterium UBA2273: 0.03%
Sulfurospirillum sp UBA 9867 Branch: 0.08%
Sulfurospirillum 9861 Branch: 0.02%
Proteobacteria bacterium UBA 7383 Branch: 0.06%
Cutibacterium acnes isolate UBA1564: 0.94%
Propionibacteriaceae bacterium UBA6214: 0.06%
Microbacterium sp. isolate UBA11082: 0.73%
Microbacterium 7429 Branch: 0.02%
Janibacter terrae isolate UBA8491: 0.02%
Micrococcus luteus UBA 14334 Branch: 0.02%
Dietzia sp. isolate UBA9897: 0.07%
Actinobacteria bacterium UBA3016: <0.01%
uncultured Collinsella sp. isolate UMGS1790: 0.07%
Acidimicrobiaceae bacterium isolate UBA9382: 0.05%
Lactobacillus plantarum isolate UBA4900: 0.06%
Streptococcus s 7591 Branch: 0.02%
Lactococcus lactis isolate UBA1590: 0.02%
Leuconostoc mesenteroides UBA 14089 Branch: 0.03%
Staphylococcus epidermidis isolate UBA4169: 0.01%
Acetobacterium sp. UBA5834: 0.13%
Ruminococcaceae bacterium UBA 5925 Branch: <0.01%
Erysipelotrichaceae bacterium isolate UBA8511: 0.03%
Anaerolineaceae bacterium isolate UBA9937: 0.1%
Flavobacterium sp. UBA6195: 0.76%
Flavobacterium sp UBA 2124 Branch: <0.01%
Algoriphagus sp UBA 4595 Branch: 0.08%
Sphingobacterium sp. isolate UBA11251: 0.03%
Bacteroidetes bacterium UBA6183: 0.02%
Sediminibacterium sp. UBA657: 0.01%
Gemmatimonas sp. UBA7669: 0.04%
Candidatus Omnitrophica bacterium isolate UBA10183: 0.46%
Candidatus Omnitrophica bacterium UBA1562: 0.11%
bacterium UBA5577: 0.05%
bacterium UBA951: 0.04%
Candidatus Saccharibacteria bacterium UBA892: 0.03%
Candidatus Daviesbacteria bacterium isolate UBA10151: 0.02%
Nitrospiraceae bacterium isolate UBA8922: 0.09%
Nitrospiraceae bacterium UBA1546: 0.04%
Holophagaceae bacterium isolate UBA8503: 0.05%


Candidatus Daviesbacteria bacterium isolate UBA1287: 25.26%
Comamonas aquatica isolate UBA1287: 25.26%
Comamonas sp. UBA2122: 0.8%
Comamonas terrigena isolate UBA11883: 0.23%
Comamonas kerstersii isolate UBA11446: 0.12%
Comamonadaceae bacterium isolate UBA8497: 13.8%
Comamonadaceae bacterium UBA4602: 0.2%
Comamonadaceae bacterium UBA4184: 0.13%
Comamonadaceae bacterium UBA3390 Branch: 0.09%
Comamonadaceae bacterium UBA2121: 0.07%
Comamonadaceae bacterium UBA3515: 0.05%
Acidovorax delafieldii isolate UBA3485: 3.04%
Acidovorax sp. UBA4409: 0.44%
Rhodoferax sp. isolate UBA10158: 2.66%
Delftia acidovorans isolate UBA7618: 0.31%
Delftia tsuruhatensis isolate UBA2300: 0.11%
Hydrogenophaga sp. UBA6679: 0.3%
Hydrogenophaga sp. UBA 14680 Branch: 0.4%
Hylemonella sp. UBA4115: 0.25%
Alicycliphilus sp. isolate UBA7973: 0.18%
Curvibacter sp. isolate UBA 12148 Branch: 0.13%
Ramlibacter tataouinensis UBA10861: 0.08%
Polaromonas sp. isolate UBA666: 0.54%
Aquabacterium sp. UBA7699: 0.09%
Tepidimonas sp. UBA7697: 0.09%
Thiomonas sp. UBA1834: 0.15%
Thiomonas bacterium UBA454: 0.02%
Betaproteobacteria bacterium UBA 11259 Branch: 0.15%
Burkholderiales bacterium UBA10164: 0.02%
Limnobacter sp UBA 7095 Branch: 0.07%
Ralstonia 9025 Branch: 0.07%
Polynucleobacter sp. isolate UBA12253: 0.02%
Massilia sp. UBA2117: 0.07%
Massilia timonae isolate UBA812: 0.04%
Herbaspirillum sp. UBA812: 0.04%
Herbaspirillum bacterium isolate UBA8502: 0.02%
Oxalobacteraceae bacterium UBA2293: 0.26%
Oxalobacter 3678 Branch: 0.06%
Achromobacter UBA5582: 0.21%
Betaproteobacteria bacterium UBA7395: 0.21%
Betaproteobacteria bacterium UBA2592: 0.07%
Betaproteobacteria bacterium UBA1934: 0.03%
Betaproteobacteria bacterium
Candidatus Accumulibacter 1607 Branch: 0.16%
Candidatus Accumulibacter phosphatis GCA 1601 Branch: 0.12%
Candidatus Accumulibacter sp. isolate UBA11064: 0.04%
Dechloromonas sp. UBA6271: 0.31%
Rhodocyclaceae bacterium UBA2250: 0.04%
Rhodocyclaceae bacterium UBA4043: 0.03%
Rhodocyclaceae bacterium UBA2271: 0.03%
uncultured Rhodocyclaceae bacterium UBA5533: 0.02%
uncultured Rhodocyclaceae bacterium isolate UMGS1167: 0.08%
Thauera sp. isolate UBA9855: 0.03%
Thiobacillus denitrificans UBA 10121 Branch: 0.13%
Thiobacillus sp. UBA2597: 0.02%
Gallionellaceae bacterium UBA2239: 0.02%
Brevundimonas sp. UBA 8083: 9.9%
Brevundimonas sp. UBA 4064 Branch: 0.27%
Caulobacteraceae bacterium UBA6225: 3.19%
Caulobacteraceae bacterium UBA3198: 1.6%
Caulobacteraceae bacterium UBA3605: 0.6%
Caulobacter vibrioides isolate UBA2596: 0.06%
Basidiomycota sp. UBA7677: 0.55%
Sphingopyxis sp. UBA6723: 0.1%
Sphingobium yanoikuyae UBA 11373 Branch: 0.06%
Sphingobium sp. isolate UBA8887: 0.03%
Sphingomonas sp. UBA6722: 0.03%
Sphingomonas bacterium isolate UBA4015: 0.03%
Porphyrobacter sp. UBA7686: 0.05%
Porphyrobacter sp. isolate UBA8508: 0.32%
Sphingomonadales bacterium UBA7471: 0.01%
Sphingomonadales bacterium UBA456: 0.02%
Gemmobacter sp. isolate UBA12163: 0.97%
Rhodobacter sp. UBA9341 Branch: 0.02%
Gemmobacter UBA3460: 0.08%
Rhodobacteraceae bacterium UBA9341 Branch: 0.02%
Rhizobiaceae bacterium UBA6718: 0.46%
Rhizobium sp. UBA7071 Branch: 0.05%
Rhizobium sp. UBA1286: 1.74%
Pseudomonas stutzeri isolate UBA1872: 0.71%
Pseudomonas mendocina isolate UBA6922: 0.14%
Pseudomonas oleovorans isolate UBA6823: 0.02%
Pseudomonas aeruginosa UBA 3122 Branch: 0.03%
Pseudomonas nitroreducens isolate UBA6548: 0.59%
Pseudomonas kunmingensis isolate UBA6515 Branch: 0.04%
Pseudomonas sp. UBA3067 Branch: 0.03%
Pseudomonas sp. UBA306d 2.85%
Acinetobacter sp. UBA2051: 1.92%
Acinetobacter lwoffii isolate UBA11272: 1.13%
Acinetobacter johnsonii isolate UBA12054: 0.72%
Acinetobacter junii isolate UBA2046: 0.37%
Acinetobacter nosocomialis isolate UBA5830: 0.03%
Acinetobacter ursingii isolate UBA10045: 0.03%
Acinetobacter radioresistens isolate UBA8912: 0.02%
Moraxellaceae bacterium UBA8912: 0.02%
Moraxellaceae bacterium isolate UBA8155: 0.32%
Alcanivorax sp. UBA 4856 Branch: 0.09%
Alcanivorax sp. UBA 4856 Branch: 0.09%
Xanthomonadaceae bacterium isolate UBA11892 Branch: 0.25%
Stenotrophomonas sp. isolate UBA12194: 0.16%
Stenotrophomonas maltophilia isolate UBA705: 0.11%
Stenotrophomonas sp. UBA 4856 Branch: 0.09%
Stenotrophomonas sp. UBA 4856 Branch: 0.09%
Stenotrophomonas maltophilia isolate UBA12194: 0.16%
Rhizobiaceae bacterium UBA10730: 0.02%
Aeromonas hydrophila isolate UBA13817 Branch: 0.06%
Aeromonas sp. isolate UBA10730: 0.02%
Ewingella americana UBA 9981 Branch: 0.03%
Pantoea agglomerans UBA 9981 Branch: 0.03%
Rheinheimera sp. isolate UBA8519: 0.03%
Gammaproteobacteria bacterium isolate UBA7966: 0.02%
Cellvibrio sp. UBA7671: 0.02%
Deltaproteobacteria bacterium isolate UBA9968: 4.43%
Geobacter sp. isolate UBA4899: 1.73%
Geobacter sp UBA 11304 Branch: 0.28%
Desulfomicrobium sp. UBA5193: 0.63%
Desulfovibrio sp. UBA6121: 0.32%
Desulfovibrionaceae bacterium UBA 14672 Branch: 0.03%
Syntrophus sp. (in: Bacteria) isolate UBA9985: 0.03%
Desulfobulbaceae bacterium UBA2273: 0.03%
Sulfurospirillum sp UBA 9867 Branch: 0.09%
Sulfurospirillum 9861 Branch: 0.02%
Proteobacteria bacterium UBA 7383 Branch: 0.06%
Cutibacterium acnes isolate UBA1564: 0.94%
Propionibacteriaceae bacterium UBA6214: 0.06%
Microbacterium sp. isolate UBA11082: 0.73%
Microbacterium 7429 Branch: 0.02%
Janibacter terrae isolate UBA8491: 0.02%
Micrococcus luteus UBA 14334 Branch: 0.02%
Dietzia sp. isolate UBA9897: 0.07%
Actinobacteria bacterium UBA3016: <0.01%
ncultured Collinsella sp. isolate UMGS1790: 0.07%
Acidimicrobiaceae bacterium isolate UBA9382: 0.05%
Lactobacillus plantarum isolate UBA4900: 0.06%
Streptococcus s 7591 Branch: 0.02%
Lactococcus lactis isolate UBA1590: 0.02%
Leuconostoc mesenteroides UBA 14089 Branch: 0.03%
Staphylococcus epidermidis isolate UBA4169: 0.01%
Acetobacterium sp. UBA5834: 0.13%
Anaerolineaceae bacterium UBA 5925 Branch: <0.01%
Ruminococcaceae bacterium isolate UBA8511: 0.03%
Erysipelotrichaceae bacterium isolate UBA9937: 0.1%
Flavobacterium sp. UBA6195: 0.01%
Flavobacterium sp. UBA6195: 0.01%
Algoriphagus sp UBA 2124 Branch: 0.08%
Algoriphagus sp UBA 4595 Branch: 0.08%
Flavobacterium sp. UBA11251: 0.03%
Sphingobacterium sp. isolate UBA11251: 0.03%
Sediminibacterium sp. UBA657: 0.01%
Gemmatimonas sp. UBA7669: 0.04%
Bacteroidetes bacterium UBA6183: 0.02%
Candidatus Omnitrophica bacterium isolate UBA10151: 0.06%
Candidatus Omnitrophica bacterium UBA10151: 0.06%
Candidatus Saccharibacteria bacterium UBA992: 0.03%
bacterium UBA9357: 0.04%
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bacterium UBA9357: 0.04


Bacteria
Proteobacteria
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Gammapr..acteria
Pseudomonadales
Pseudomonadaceae
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Morax..aceae
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Comamon..cterium
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Burkholderiales
Betapro..acteria
Acidovorax
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9.9% - Brevundimonas sp. isolate UBA8083
3.19% - Caulobacteraceae bacterium UBA6225
1.6% - Caulobacteraceae bacterium UBA3608
1.6% - Caulobacteraceae bacterium UBA3198
15 more
4.46% - Pseudomonas sp. UBA6718
1.74% - Pseudomonas stutzeri isolate UBA1286
7 more
2.85% - Acinetobacter sp. UBA3060
1.92% - Acinetobacter lwoffii isolate UBA2051
1.13% - Acinetobacter johnsonii isolate UBA11272
4 more
1.81% - Alcanivorax sp. UBA2512
7 more
4.43% - Deltaproteobacteria bacterium isolate UBA9968
1.25% - Geobacter sp. isolate UBA8499
5 more
8 more
2 more
2 more
16 more
Comamonas aquatica isolate UBA1287 - 25.26%
Comamonas
Comamon..quatica
3 more
Comamonadaceae bacterium isolate UBA8497 - 13.8%
Acidovorax delafieldii isolate UBA3485 - 3.04%
Acidovorax sp. isolate UBA10156 - 2.66%
9 more
13 more
8 more


Deltaproteobacteria bac
Caulobacteraceae bac
Acidovorax delafiel
Pseudomonas sp. UBA6718
Flavobact
Microbact
Acinetoba
Comamonas
Geoba
Brevu
Pseudomon
Acinetobacter sp.
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Brevundimonas sp. isolate UBA8083:
Cutibacter
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Blastomo
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Geobacter sp
Limn
Pol
Xantho
Aren
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Alg
Ste
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Comam
Aquabact
Cand
Mora
Curv
Sten
Gemmob
Acinetobacter l
Candida
Caulobacterace
Acinet
Hydroge
Rhodofe
Alcanivorax sp.
Caulobacterace
Pseudomonas st
Comamonadaceae bacterium isolate UBA8497:
Comamonas aquatica isolate UBA1287:25.26%

Genomic Sequencing Report

Microbac Oak Ridge WO# Z3FG0106-04 **9/7/2023**

Client: Andrew Klingbell

Sample Project: PERSOM UDEX Release, Former PHL Refineries 2134030309

Sample ID: BF-103R-20230720

Sample Collected: 7/20/2023

qPCR Overview: Estimated Bacterial Biomass 3.25e10 gc/L

NCBI Taxonomy Browser to look up "Taxonomy Id"
https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi add number in "Search for" in upper left box.

Summary:

- There were 9.805 reads for this sample and the file size was 2.01 GB.
- There were 197 identifications (ID's) in the bacterial data set.
- There were 3 identifications in the virus data set.
- There were 9 identifications in the protists data set.
- There were 16 identifications in the fungal data set.
- There were 53 identifications in the Combined Kingdom data set.
- There was 1 identification in the Antimicrobial Resistance data set.
- There were 46 identifications in the Virulence Factors data set.
- There were 12 identifications in the phages data set.
- There were 178 identifications in the Dark Matter (Beta) data set.

The Oak Ridge Microbac laboratory uses the CosmosID bioinformatics pipeline and cloud computing platform for analysis and report generation. The report consists of tables and figures for bacteria, antibiotic resistance genes, fungi, protists, phages, viruses, secondary bacterial (Dark Matter) and virulence genes.

Report Definitions

- **Name:** The name for the organism or taxonomic level or the name of the antibiotic resistance gene or virulence factor.
- **Calls at different taxonomic levels:** In the results there may be some calls at sub-species or strain level and others at species or genus level or higher. CosmosID calls the lowest level

possible based on the identification of unique kmers that match the reference genomes. If identification was not possible at strain level, for example, there will be a try to make an identification at species level etc.

- **Tax ID:** The tax id is the NCBI taxonomic id for the organism.
- **Frequency:** The number of unique kmer occurrences in the queried sample. This is roughly equivalent to the number of reads that matched to the organism identified.
- **Unique Matches:** Unique matches percent is the amount of unique kmers that were found in the sample for an organism out of the total possible number of kmers in the database that are unique to that organism.
- **Total Matches:** The shared plus unique matches divided by the pre-calculated shared plus unique matches possible in the reference database.
- **Relative Abundance:** Relative abundance is calculated based on the number of organism specific kmers and their observed frequency in the sample and then normalized to represent the abundance of each organism.

The following are the methods used for sample processing and analysis for this project:

DNA Extraction :

DNA samples were quantified using Qubit 4 fluorometer and Qubit™ dsDNA HS Assay Kit (Thermofisher Scientific).

Library Preparation and Sequencing:

DNA libraries were prepared using the Nextera XT DNA Library Preparation Kit (Illumina) and IDT Unique Dual Indexes with total DNA input of 1ng. Genomic DNA was fragmented using a proportional amount of Illumina Nextera XT fragmentation enzyme. Unique dual indexes were added to each sample followed by 12 cycles of PCR to construct libraries. DNA libraries were purified using AMpure magnetic Beads (Beckman Coulter) and eluted in QIAGEN EB buffer. DNA libraries were quantified using Qubit 4 fluorometer and Qubit™ dsDNA HS Assay Kit. Libraries were then sequenced on an Illumina NextSeq 2000 platform 2x150bp

Bioinformatics Analysis:

Unassembled sequencing reads were directly analyzed by CosmosID-HUB Microbiome Platform (CosmosID Inc., Germantown, MD) described elsewhere (Ottensen et al., 2016, Ponnusamy et al., 2016, Hasan et al., 2014, Lax et al., 2014) for multi-kingdom microbiome analysis and profiling of antibiotic resistance and virulence genes and quantification of organisms' relative abundance. Briefly, the system utilizes curated genome databases and a high performance data-mining algorithm that rapidly disambiguates hundreds of millions of metagenomic sequence reads into the discrete microorganisms engendering the particular sequences. Similarly, the community resistome and virulome, the collection of antibiotic resistance and virulence associated genes in the microbiome, were also identified by querying the unassembled sequence reads against the CosmosID curated antibiotic resistance and virulence associated gene databases.

Fasta/q details

Name	Value
Hit	744183

Table

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Desulfobulbus sp. Tol-SR	1536652	16369.63	29.34%	76.73	76.73	353835
Acidovorax sp. T1	1858609	11382.36	20.40%	37.54	52.32	635
Pseudoxanthomonas spadix BD-a59	1045855	4419.19	7.92%	31.30	31.35	68469
Extensimonas perlucida	2590786	2874.18	5.15%	21.25	21.17	51823
Zoogloea oleivorans	1552750	2163.78	3.88%	16.59	16.38	50107
Acidovorax carolinensis	553814	2071.82	3.71%	4.41	11.82	7033
Pseudomonas extremaustralis 14-3 substr. 14-3b	1117958	1514.99	2.72%	12.19	12.18	33373
Smithella sp. F21	1538640	1327.74	2.38%	12.33	12.33	9406
Pseudomonas aeruginosa	287	1181.49	2.12%	35.99	12.11	1700
Sphingobium sp. TKS	1315974	1011.32	1.81%	7.35	6.88	29066
Herbaspirillum sp. RV1423	1443993	578.33	1.04%	5.20	5.20	13604
Mycolicibacterium sp. CH28	2512237	548.74	0.98%	5.03	5.02	12792
Sphingomonas sp. Ant H11	1564113	540.54	0.97%	18.31	3.65	5553
Parvibaculum sedimenti	2608632	534.21	0.96%	4.85	4.87	11460
Aquabacterium commune	70586	516.12	0.92%	4.34	4.48	12056
Luteibacter sp. UNCMF366Tsu5.1	1502758	502.04	0.90%	4.56	4.57	12174
Acidovorax defluvii	86669	491.14	0.88%	1.26	3.26	2522
Sulfuricurvum kujiense DSM 16994	709032	463.31	0.83%	4.62	4.72	6172
Solimonas aquatica	489703	439.67	0.79%	4.12	4.10	9762
Zavarzinia aquatilis	2211142	422.11	0.76%	3.59	3.73	10538
Streptococcus thermophilus LMD-9	322159	371.22	0.66%	1.17	4.58	13
Azospira sp. I09	1765049	283.37	0.51%	1.32	2.78	1099
Caulobacter sp. 602-1	2492472	274.45	0.49%	2.31	2.59	6503
Aquabacterium sp. NJ1	1538295	258.22	0.46%	2.56	2.57	6362
Azospira oryzae PS	640081	252.98	0.45%	1.16	2.52	997

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Polaromonas naphthalenivorans CJ2	365044	201.66	0.36%	1.61	1.86	5136
Legionella drancourtii LLAP12	658187	193.69	0.35%	2.25	2.23	2346
Cupriavidus sp. WS	1312922	172.73	0.31%	1.45	2.77	2307
Propionibacteriaceae	31957	172.32	0.31%	4.26	3.81	43
Magnetospirillum sp. 15-1	1979370	166.43	0.30%	1.22	1.63	3438
Cupriavidus basilensis	68895	160.14	0.29%	1.37	2.68	2209
Nevskia soli DSM 19509	1122604	151	0.27%	1.55	1.55	4173
Rhodoferax sp. OTU1	2109322	148.24	0.27%	1.09	1.18	5460
Sphingobium barthaii	1054037	148.49	0.27%	1.52	1.22	1258
Azovibrio restrictus DSM 23866	1121035	126.35	0.23%	0.91	0.92	3941
Xanthobacter autotrophicus Py2	78245	123.95	0.22%	1.00	1.26	2878
Azorhizobium doebereinerae UFLA1-100	1038858	105.13	0.19%	1.10	1.14	2881
Acidovorax soli	592050	99.5	0.18%	0.83	1.51	2416
Verminephrobacter	364316	92.44	0.17%	1.48	1.48	30
Lactococcus lactis subsp. cremoris HP	1295827	86.45	0.16%	1.29	1.28	32
Paraburkholderia kururiensis subsp. thiooxydans NBRC 107107	1218081	85.82	0.15%	0.95	1.10	2501
Parcubacteria bacterium RAAC4_OD1_1	1394712	68.81	0.12%	0.72	0.72	201
Pseudomonas veronii 1YdBTEX2	1295141	65.97	0.12%	0.95	2.47	443
Reyranella massiliensis 521	1205680	63.19	0.11%	0.60	0.76	2578
Paraburkholderia aromaticivorans	2026199	62.31	0.11%	0.72	0.80	1863
Magnetospirillum gryphiswaldense MSR-1 v2	1430440	57.62	0.10%	0.65	0.67	1628
Paraburkholderia xenovorans LB400	266265	56.08	0.10%	0.65	0.76	1731
Geothrix fermentans DSM 14018	1121920	55.26	0.10%	0.67	0.67	1198
Geobacter lovleyi SZ	398767	46.16	0.08%	0.50	0.61	1176
Magnetospirillum caucaseum	1244869	45.77	0.08%	0.52	0.98	1382
Acidovorax delafieldii 2AN	573060	44.98	0.08%	0.40	0.48	2071
unclassified Ralstonia	209769	45.42	0.08%	2.05	2.05	8
Zavarzinia compransoris	1264899	43.56	0.08%	0.47	0.64	1527

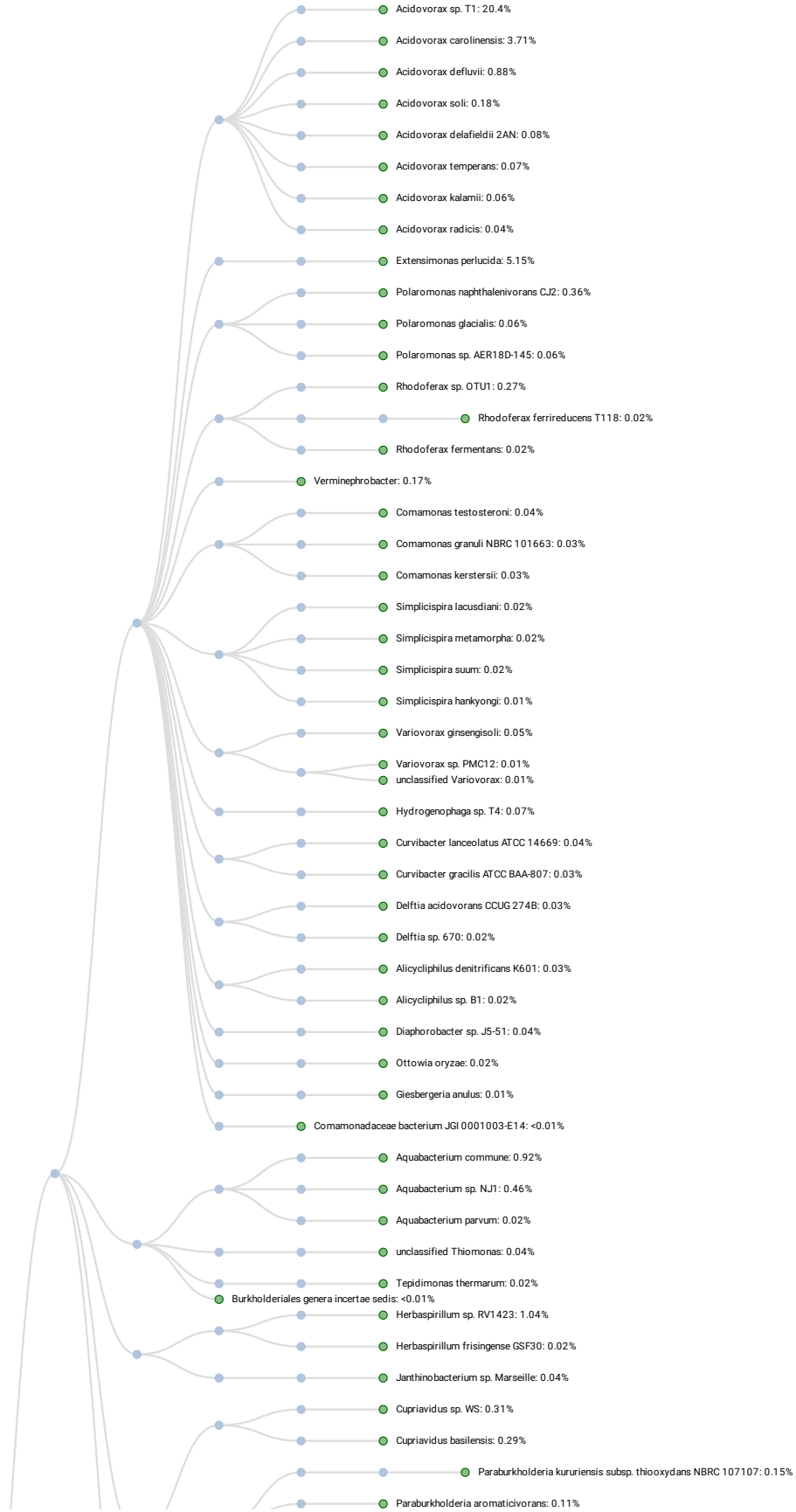
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Pseudomonas sp. DP16D-R1	2075551	42.25	0.08%	0.56	1.08	704
Solimonas variicoloris DSM 15731	1123256	40.83	0.07%	0.41	0.59	1581
Hydrogenophaga sp. T4	1437444	39.42	0.07%	0.44	0.80	1185
Dechloromonas aromatica RCB	159087	39.12	0.07%	0.39	0.40	1562
Acidovorax temperans	80878	36.13	0.07%	0.31	0.31	1571
Polaromonas glacialis	866564	35.59	0.06%	0.40	0.65	1310
Acidocella facilis ATCC 35904	1408419	35.89	0.06%	0.50	0.42	392
Polaromonas sp. AER18D-145	1977060	34.9	0.06%	0.39	0.52	1099
Xanthobacter sp. 29k	2607286	34.92	0.06%	0.44	0.79	1082
Acidovorax kalamii	2004485	32.93	0.06%	0.39	0.51	941
Magnetospirillum magneticum AMB-1	342108	32.72	0.06%	0.38	0.70	1039
Rectinema subterraneum	2653714	32.55	0.06%	0.23	0.22	871
Geobacter metallireducens	28232	30.9	0.06%	0.39	0.40	846
Rhodanobacter	75309	30.05	0.05%	0.11	0.11	8
Candidatus Microthrix parvicella RN1	1229780	29.54	0.05%	0.44	0.85	330
Magnetospirillum magnetotacticum MS-1	272627	28.64	0.05%	0.35	0.52	852
Anaerosporomusa subterranea	1794912	27.56	0.05%	0.39	0.39	545
Variovorax ginsengisoli	363844	26.78	0.05%	0.32	0.32	994
Rugosibacter aromaticivorans	1565605	25.93	0.05%	0.33	0.33	631
Rhizobium sp. ACO-34A	1571470	25.17	0.05%	0.33	0.33	841
Acidovorax radicis	758826	24.49	0.04%	0.32	0.32	401
Lactobacillus helveticus DPC 4571	405566	24.38	0.04%	0.89	0.54	13
Diaphorobacter sp. J5-51	680496	24.06	0.04%	0.35	0.28	273
Reyranella soli	1230389	23.71	0.04%	0.24	0.55	1150
unclassified Mesorhizobium	325217	23.45	0.04%	0.51	0.51	47
Dechloromonas hortensis	337779	23.1	0.04%	0.26	0.28	875
Magnetospirillum moscoviense	1437059	22.96	0.04%	0.26	0.29	822
Solimonas flava DSM 18980	1123257	22.72	0.04%	0.25	0.48	1006
Janthinobacterium sp. Marseille	375286	22.41	0.04%	0.31	0.31	615
Magnetospirillum	13134	22.17	0.04%	0.33	0.33	49
Rhodospirillales bacterium URHD0017	1380357	22.11	0.04%	0.24	0.53	1024
Desulfosporosinus sp. Tol-M	1536651	22.39	0.04%	0.36	0.36	295

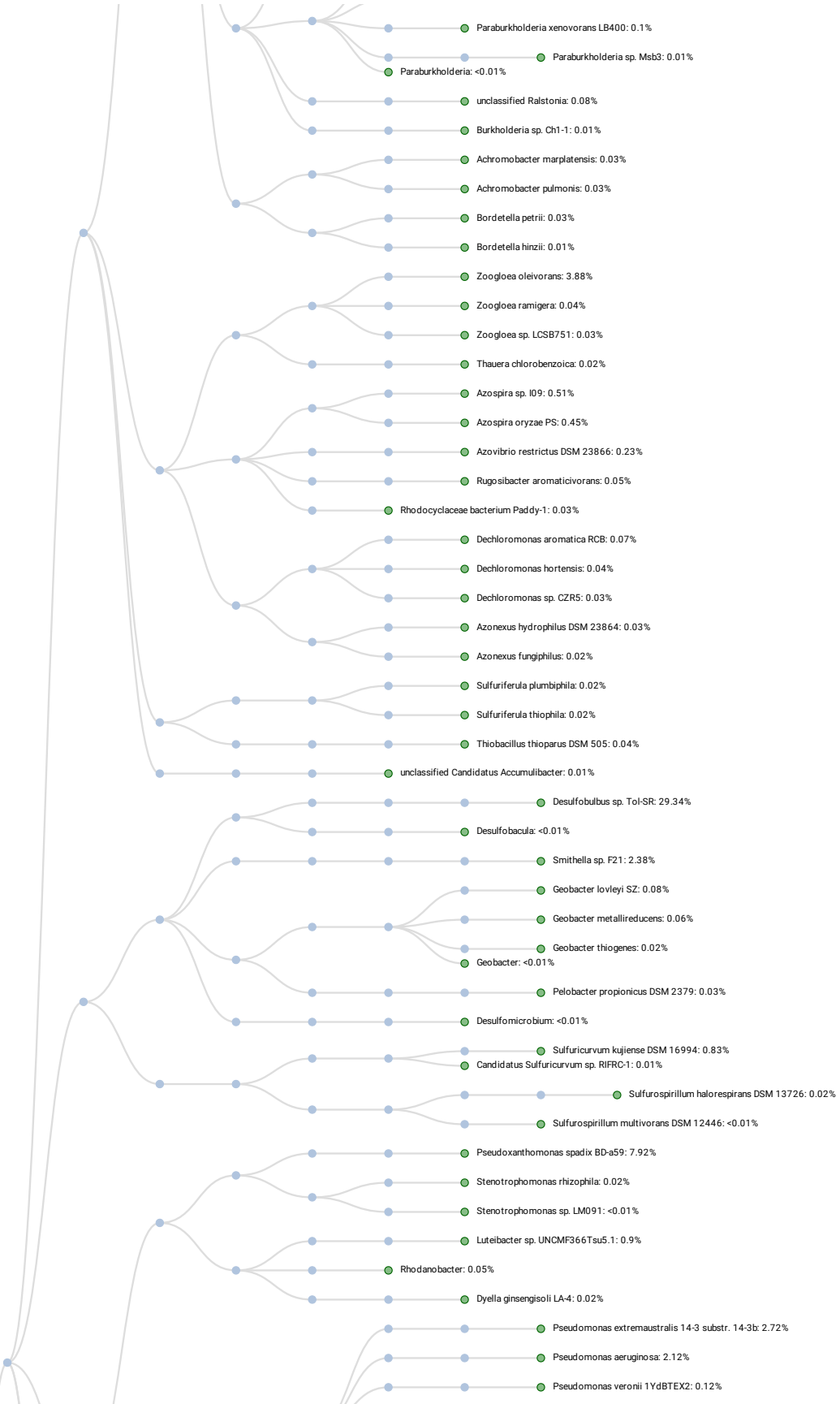
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
unclassified Thiomonas	2625466	21.53	0.04%	2.13	2.13	2
Leptospira kobayashii	1917830	21.92	0.04%	0.31	0.31	438
Curvibacter lanceolatus ATCC 14669	1265504	20.62	0.04%	0.27	0.35	655
Comamonas testosteroni	285	20.13	0.04%	0.35	0.35	171
Zoogloea ramigera	350	20.25	0.04%	0.24	0.46	843
Thiobacillus thioparus DSM 505	1123393	19.82	0.04%	0.27	0.27	564
Candidatus Cryosericum hinesii	2290915	20.2	0.04%	0.28	0.28	417
Bordetella petrii	94624	18.02	0.03%	0.29	0.40	2141
Chryseobacterium sp. SC28	2268028	17.63	0.03%	0.30	0.30	220
Parcubacteria bacterium SCGC AAA011-A08	1046985	18.06	0.03%	0.32	0.32	61
Rhodocyclaceae bacterium Paddy-1	1691980	17.52	0.03%	0.16	0.12	372
Dechloromonas sp. CZR5	2608630	17.09	0.03%	0.21	0.22	691
Curvibacter gracilis ATCC BAA-807	1336244	16.66	0.03%	0.19	0.30	703
Achromobacter marplatensis	470868	16.51	0.03%	0.23	0.23	577
Azonexus hydrophilus DSM 23864	1121032	16.61	0.03%	0.19	0.20	611
Acidocella aminolytica 101 = DSM 11237	1120923	16.59	0.03%	0.20	0.25	603
Delftia acidovorans CCUG 274B	883101	16.38	0.03%	0.30	0.51	139
Achromobacter pulmonis	1389932	16.23	0.03%	0.22	0.19	347
Caulobacter segnis ATCC 21756	509190	16.06	0.03%	0.21	0.37	626
Solimonas soli DSM 21787	1123261	15.41	0.03%	0.18	0.26	732
Comamonas granuli NBRC 101663	1223521	15.28	0.03%	0.19	0.20	517
Zoogloea sp. LCSB751	1965277	15.23	0.03%	0.19	0.34	637
Pseudomonas moorei	395599	14.86	0.03%	0.22	0.70	376
Nevskia ramosa DSM 11499	1122603	14.97	0.03%	0.20	0.20	593
Alicycliphilus denitrificans K601	596154	14.76	0.03%	0.24	0.19	155
Comamonas kerstersii	225992	14.61	0.03%	0.19	0.19	452
Pelobacter propionicus DSM 2379	338966	14.23	0.03%	0.12	0.12	733
Pseudomonas mohnii	395600	13.9	0.03%	0.25	0.96	147
Peptococcaceae bacterium SCADC1_2_3	1487582	13.97	0.03%	0.19	0.19	252

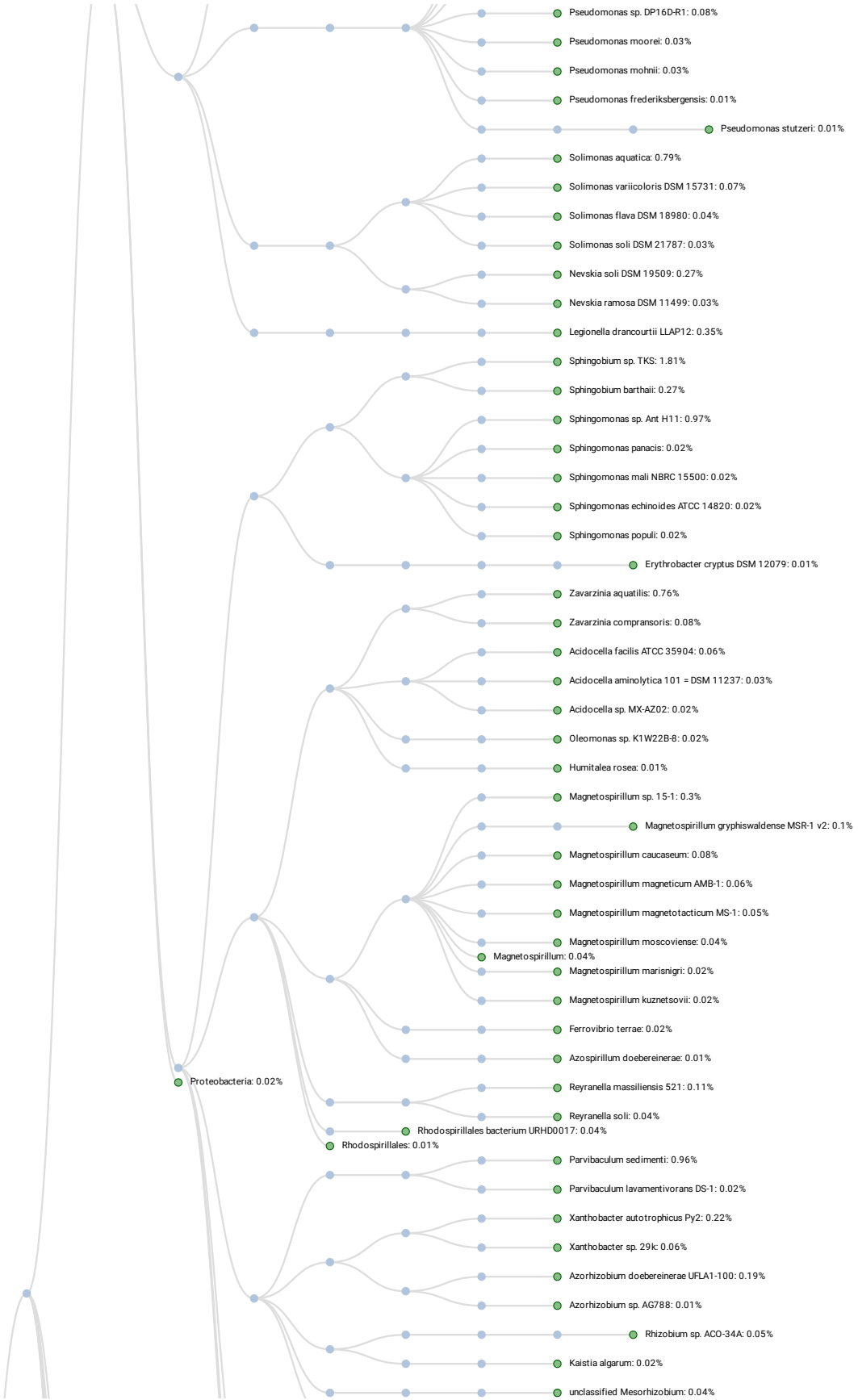
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Simplicispira lacusdiani	2213010	13.28	0.02%	0.15	0.16	527
Tepidimonas thermarum	335431	13.45	0.02%	0.17	0.17	446
Sphingomonas panacis	1560345	13.24	0.02%	0.18	0.26	540
Mycobacterium sp. ENV421	1213407	13.23	0.02%	0.18	0.14	508
Simplicispira metamorpha	80881	12.84	0.02%	0.15	0.15	515
Sphingomonas mali NBRC 15500	1219048	12.76	0.02%	0.14	0.21	688
Geobacter thiogenes	115783	12.16	0.02%	0.16	0.30	327
Kaistia algarum	2083279	12.02	0.02%	0.17	0.17	452
Proteobacteria	1224	12.21	0.02%	13.83	13.83	106
Herbaspirillum frisingense GSF30	864073	11.73	0.02%	0.21	0.44	163
Thauera chlorobenzoica	96773	11.66	0.02%	0.22	0.19	419
Oleomonas sp. K1W22B-8	2320859	11.65	0.02%	0.16	0.16	476
Alicycliphilus sp. B1	1603291	11.43	0.02%	0.18	0.23	184
Sulfuriferula plumbiphila	171865	11.32	0.02%	0.17	0.19	325
Magnetospirillum marisnigri	1285242	10.95	0.02%	0.15	0.18	403
Ferrovibrio terrae	2594003	11	0.02%	0.16	0.16	374
Acidocella sp. MX-AZ02	1214225	11.26	0.02%	0.19	0.27	164
Phenylobacterium immobile (ATCC 35973)	31967	10.94	0.02%	0.17	0.17	305
Gemmatimonas	173479	11.31	0.02%	0.74	0.70	5
Cutibacterium acnes	1747	11.11	0.02%	0.18	0.19	110
Pelolinea submarina	913107	11.17	0.02%	0.17	0.17	283
Rariglobus hedericola	2597822	11.32	0.02%	0.16	0.16	467
Delftia sp. 670	1537702	10.39	0.02%	0.17	0.48	121
Simplicispira suum	2109915	10.33	0.02%	0.14	0.15	416
Sulfuriferula thiophila	1781211	10.67	0.02%	0.17	0.17	248
Sphingomonas echinoides ATCC 14820	1112212	10.41	0.02%	0.14	0.91	371
Brevundimonas	41275	10.5	0.02%	0.38	0.38	4
Leptospira terpstrae serovar Hualin str. LT 11-33 = ATCC 700639	1257025	10.61	0.02%	0.19	0.18	161
Ottowia oryzae	2109914	10.24	0.02%	0.11	0.12	561
Azonexus fungiphilus	146940	9.86	0.02%	0.11	0.12	482
Sphingomonas populi	2484750	9.78	0.02%	0.13	0.21	477

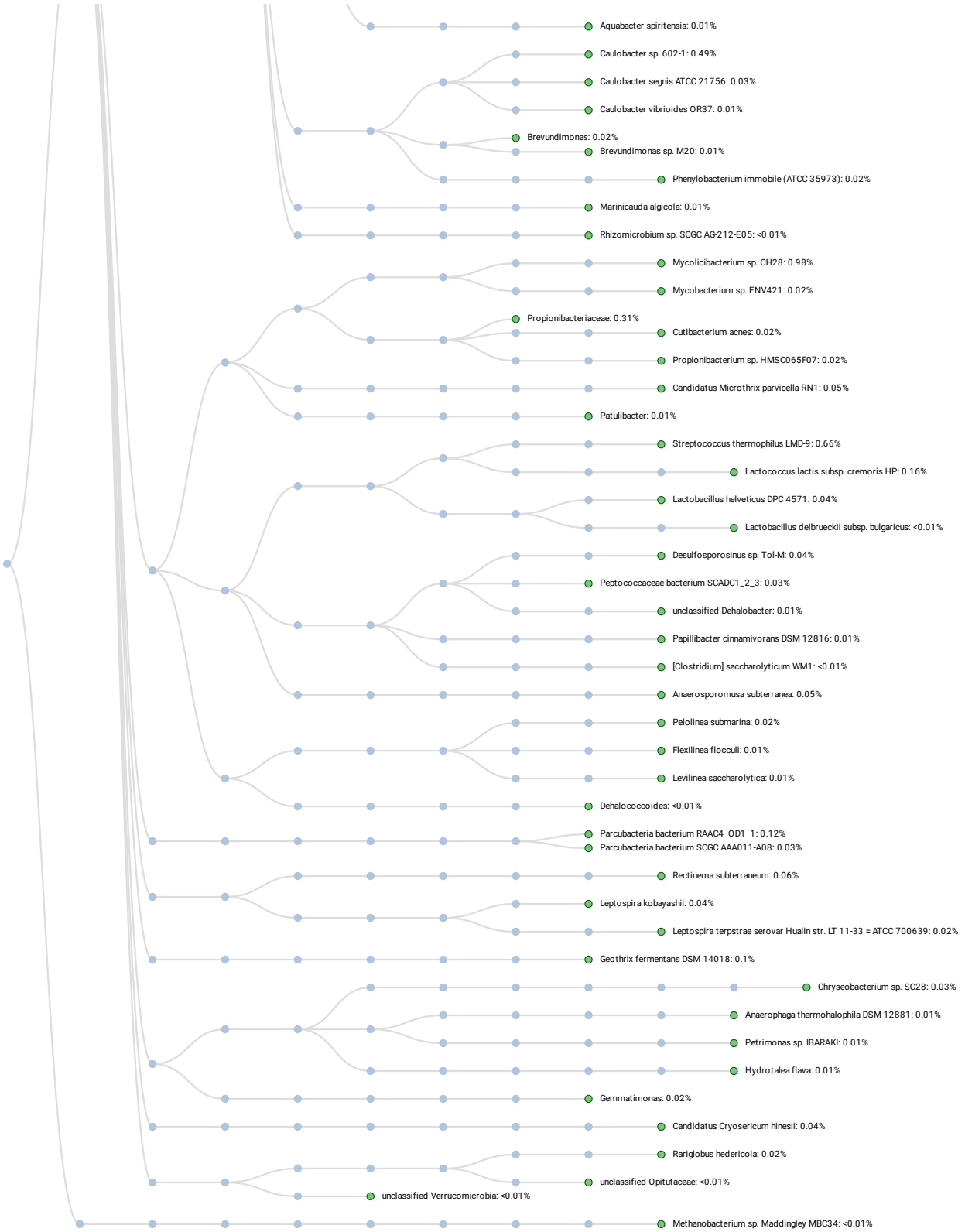
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Sulfurospirillum halorespirans DSM 13726	1193502	9.09	0.02%	0.17	0.23	139
Magnetospirillum kuznetsovii	2053833	8.78	0.02%	0.12	0.14	362
Stenotrophomonas rhizophila	216778	8.66	0.02%	0.14	0.14	304
Dyella ginsengisoli LA-4	1234364	8.71	0.02%	0.13	0.17	317
Propionibacterium sp. HMSC065F07	1739345	8.77	0.02%	0.55	1.82	6
Rhodoferax ferrireducens T118	338969	8.37	0.02%	0.10	0.10	451
Rhodoferax fermentans	28066	8.09	0.02%	0.11	0.11	350
Aquabacterium parvum	70584	8.55	0.02%	0.12	0.38	328
Parvibaculum lavamentivorans DS-1	402881	8.24	0.02%	0.15	0.19	315
Variovorax sp. PMC12	2126319	7.62	0.01%	0.11	0.13	326
Simplicispira hankyongi	2315688	7.69	0.01%	0.11	0.12	297
Azospirillum doebereinerae	92933	7.83	0.01%	0.12	0.15	311
Caulobacter vibrioides OR37	1292034	8.06	0.01%	0.12	0.18	340
Marinicauda algicola	2029849	8.02	0.01%	0.13	0.12	269
Anaerophaga thermohalophila DSM 12881	886379	7.66	0.01%	0.13	0.12	152
Petrimonas sp. IBARAKI	1978337	7.89	0.01%	0.13	0.13	217
unclassified Dehalobacter	2635733	7.56	0.01%	0.14	0.14	15
Flexilinea flocculi	1678840	7.89	0.01%	0.17	0.17	195
Candidatus Sulfuricurvum sp. RIFRC-1	1249480	7.47	0.01%	0.14	0.28	139
Brevundimonas sp. M20	2591463	7.39	0.01%	0.12	0.12	252
Pseudomonas frederiksbergensis	104087	7.29	0.01%	0.13	0.15	1287
Levilinea saccharolytica	229921	7.17	0.01%	0.14	0.14	299
Giesbergeria anulus	180197	6.64	0.01%	0.14	0.14	616
Humitalea rosea	990373	6.82	0.01%	0.10	0.10	285
Aquabacter spiritensis	933073	6.77	0.01%	0.11	0.11	266
Paraburkholderia sp. Msb3	2604047	6.02	0.01%	0.12	0.28	85
Bordetella hinzii	103855	6.09	0.01%	0.18	0.16	23
Rhodospirillales	204441	5.9	0.01%	0.13	0.13	9
Hydrotalea flava	714549	6.13	0.01%	0.18	0.18	24
unclassified Variovorax	663243	5.51	0.01%	0.26	0.19	8
Burkholderia sp. Ch1-1	243261	5.37	0.01%	0.11	0.29	85

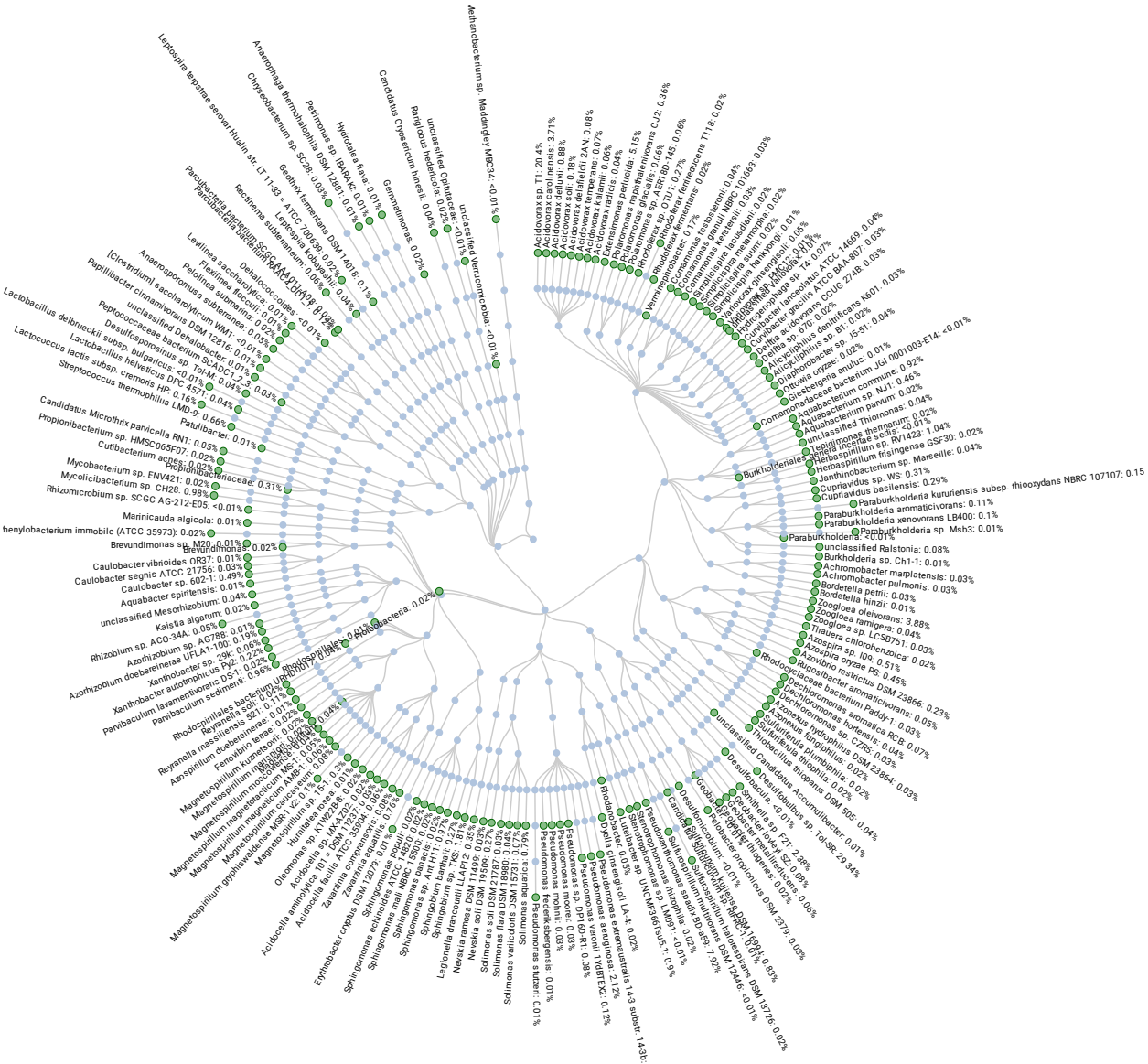
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
unclassified Candidatus Accumulibacter	2619054	5.68	0.01%	0.10	0.10	12
Erythrobacter cryptus DSM 12079	1122970	5.67	0.01%	0.11	0.10	109
Azorhizobium sp. AG788	2183897	5.85	0.01%	0.10	0.13	158
Pseudomonas stutzeri	316	5.78	0.01%	0.23	0.23	7
Papillibacter cinnamivorans DSM 12816	1122930	5.71	0.01%	0.11	0.11	125
Patulibacter	361607	5.51	0.01%	2.01	2.01	21
Sulfurospirillum multivorans DSM 12446	1150621	5.08	<0.01%	0.10	0.18	88
Stenotrophomonas sp. LM091	1904944	4.9	<0.01%	0.12	0.15	132
Methanobacterium sp. Maddingley MBC34	1220534	4.93	<0.01%	0.12	0.14	42
Geobacter	28231	4.59	<0.01%	0.14	0.14	3
Desulfomicrobium	898	4.51	<0.01%	0.30	0.30	4
Rhizomicrobium sp. SCGC AG-212-E05	1799655	4.58	<0.01%	0.11	0.11	54
[Clostridium] saccharolyticum WM1	610130	4.45	<0.01%	0.10	0.10	165
Burkholderiales genera incertae sedis	224471	3.72	<0.01%	0.12	0.12	12
Lactobacillus delbrueckii subsp. bulgaricus	1585	3.9	<0.01%	0.14	0.10	12
Paraburkholderia	1822464	2.62	<0.01%	0.14	0.14	6
unclassified Opitutaceae	278955	3.01	<0.01%	1.69	2.07	9
Comamonadaceae bacterium JGI 0001003-E14	1094956	1.7	<0.01%	0.19	0.19	2
Desulfobacula	28222	1.62	<0.01%	0.12	0.12	4
Dehalococcoides	61434	1.18	<0.01%	1.03	1.03	4
unclassified Verrucomicrobia	417295	1.29	<0.01%	0.14	0.14	2


Acidovorax sp. T1: 20.4%
Acidovorax carolinensis: 3.71%
Acidovorax defluvii: 0.88%
Acidovorax soli: 0.18%
Acidovorax delafieldii 2AN: 0.08%
Acidovorax temperans: 0.07%
Acidovorax kalamii: 0.06%
Acidovorax radicis: 0.04%
Extensimonas perlucida: 5.15%
Polaromonas naphthalenivorans CJ2: 0.36%
Polaromonas glacialis: 0.06%
Polaromonas sp. AER18D-145: 0.06%
Rhodoferax sp. OTU1: 0.27%
Rhodoferax ferrireducens T118: 0.02%
Rhodoferax fermentans: 0.02%
Verminephrobacter: 0.17%
Comamonas testosteroni: 0.04%
Comamonas granuli NBRC 101663: 0.03%
Comamonas kerstersii: 0.03%
Simplicispira lacusdiani: 0.02%
Simplicispira metamorpha: 0.02%
Simplicispira suum: 0.02%
Simplicispira hankyongi: 0.01%
Variovorax ginsengisoli: 0.05%
Variovorax sp. PMC12: 0.01%
unclassified Variovorax: 0.01%
Hydrogenophaga sp. T4: 0.07%
Curvibacter lanceolatus ATCC 14669: 0.04%
Curvibacter gracilis ATCC BAA-807: 0.03%
Delftia acidovorans CCUG 274B: 0.03%
Delftia sp. 670: 0.02%
Alicycliphilus denitrificans K601: 0.03%
Alicycliphilus sp. B1: 0.02%
Diaphorobacter sp. J5-51: 0.04%
Ottowia oryzae: 0.02%
Giesbergeria anulus: 0.01%
Comamonadaceae bacterium JGI 0001003-E14: <0.01%
Aquabacterium commune: 0.92%
Aquabacterium sp. NJ1: 0.46%
Aquabacterium parvum: 0.02%
unclassified Thiomonas: 0.04%
Tepidimonas thermarum: 0.02%
Burkholderiales genera incertae sedis: <0.01%
Herbaspirillum sp. RV1423: 1.04%
Herbaspirillum frisingense GSF30: 0.02%
Janthinobacterium sp. Marseille: 0.04%
Cupriavidus sp. WS: 0.31%
Cupriavidus basilensis: 0.29%
Paraburkholderia kururiensis subsp. thiooxydans NBRC 107107: 0.15%
Paraburkholderia aromaticivorans: 0.11%

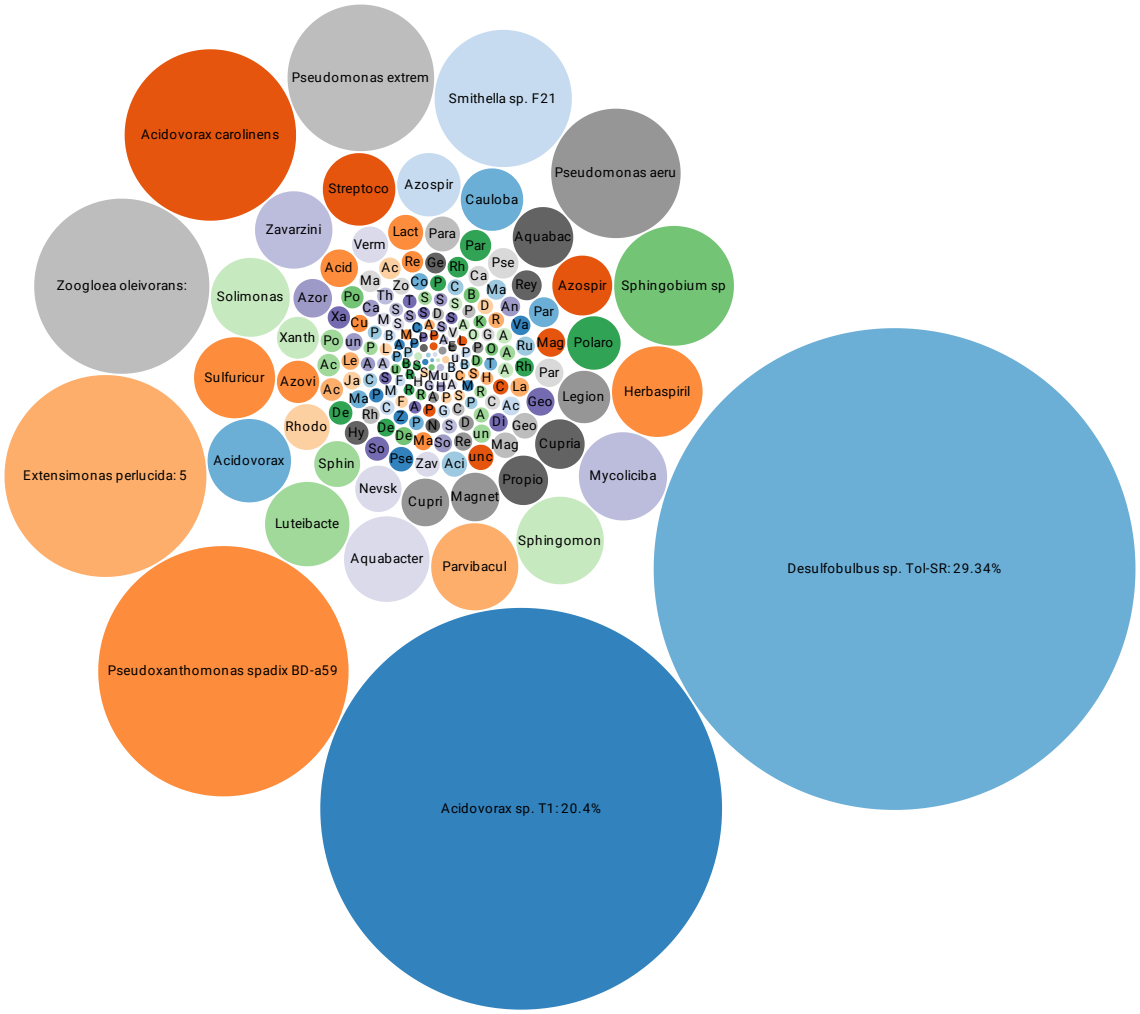

Paraburkholderia xenovorans LB400: 0.1%
Paraburkholderia sp. Msb3: 0.01%
Paraburkholderia: <0.01%
unclassified Ralstonia: 0.08%
Burkholderia sp. Ch1-1: 0.01%
Achromobacter marplatensis: 0.03%
Achromobacter pulmonis: 0.03%
Bordetella petrii: 0.03%
Bordetella hinzii: 0.01%
Zoogloea oleivorans: 3.88%
Zoogloea ramigera: 0.04%
Zoogloea sp. LCSB751: 0.03%
Thauera chlorobenzoica: 0.02%
Azospira sp. I09: 0.51%
Azospira oryzae PS: 0.45%
Azovibrio restrictus DSM 23866: 0.23%
Rugosibacter aromaticivorans: 0.05%
Rhodocyclaceae bacterium Paddy-1: 0.03%
Dechloromonas aromatica RCB: 0.07%
Dechloromonas hortensis: 0.04%
Dechloromonas sp. CZR5: 0.03%
Azonexus hydrophilus DSM 23864: 0.03%
Azonexus fungiphilus: 0.02%
Sulfuriferula plumbiphila: 0.02%
Sulfuriferula thiophila: 0.02%
Thiobacillus thioparus DSM 505: 0.04%
unclassified Candidatus Accumulibacter: 0.01%
Desulfobulbus sp. Tol-SR: 29.34%
Desulfobacula: <0.01%
Smithella sp. F21: 2.38%
Geobacter lovleyi SZ: 0.08%
Geobacter metallireducens: 0.06%
Geobacter thiogenes: 0.02%
Geobacter: <0.01%
Pelobacter propionicus DSM 2379: 0.03%
Desulfomicrobium: <0.01%
Sulfuricurvum kujiense DSM 16994: 0.83%
Candidatus Sulfuricurvum sp. RIFRC-1: 0.01%
Sulfurospirillum halorespirans DSM 13726: 0.02%
Sulfurospirillum multivorans DSM 12446: <0.01%
Pseudoxanthomonas spadix BD-a59: 7.92%
Stenotrophomonas rhizophila: 0.02%
Stenotrophomonas sp. LM091: <0.01%
Luteibacter sp. UNCMF366Tsu5.1: 0.9%
Rhodanobacter: 0.05%
Dyella ginsengisoli LA-4: 0.02%
Pseudomonas extremaustralis 14-3 substr. 14-3b: 2.72%
Pseudomonas aeruginosa: 2.12%
Pseudomonas veronii 1YdBTEX2: 0.12%


Pseudomonas sp. DP16D-R1: 0.08%
Pseudomonas moorei: 0.03%
Pseudomonas mohnii: 0.03%
Pseudomonas frederiksbergensis: 0.01%
Pseudomonas stutzeri: 0.01%
Solimonas aquatica: 0.79%
Solimonas variicoloris DSM 15731: 0.07%
Solimonas flava DSM 18980: 0.04%
Solimonas soli DSM 21787: 0.03%
Nevskia soli DSM 19509: 0.27%
Nevskia ramosa DSM 11499: 0.03%
Legionella drancourtii LLAP12: 0.35%
Sphingobium sp. TKS: 1.81%
Sphingobium barthaii: 0.27%
Sphingomonas sp. Ant H11: 0.97%
Sphingomonas panacis: 0.02%
Sphingomonas mali NBRC 15500: 0.02%
Sphingomonas echinoides ATCC 14820: 0.02%
Sphingomonas populi: 0.02%
Erythrobacter cryptus DSM 12079: 0.01%
Zavarzinia aquatilis: 0.76%
Zavarzinia compransoris: 0.08%
Acidocella facilis ATCC 35904: 0.06%
Acidocella aminolytica 101 = DSM 11237: 0.03%
Acidocella sp. MX-AZ02: 0.02%
Oleomonas sp. K1W22B-8: 0.02%
Humitalea rosea: 0.01%
Magnetospirillum sp. 15-1: 0.3%
Magnetospirillum gryphiswaldense MSR-1 v2: 0.1%
Magnetospirillum caucaseum: 0.08%
Magnetospirillum magneticum AMB-1: 0.06%
Magnetospirillum magnetotacticum MS-1: 0.05%
Magnetospirillum moscoviense: 0.04%
Magnetospirillum: 0.04%
Magnetospirillum marisnigri: 0.02%
Magnetospirillum kuznetsovii: 0.02%
Ferrovibrio terrae: 0.02%
Azospirillum doebereinerae: 0.01%
Proteobacteria: 0.02%
Reyranella massiliensis 521: 0.11%
Reyranella soli: 0.04%
Rhodospirillales bacterium URHD0017: 0.04%
Rhodospirillales: 0.01%
Parvibaculum sedimenti: 0.96%
Parvibaculum lavamentivorans DS-1: 0.02%
Xanthobacter autotrophicus Py2: 0.22%
Xanthobacter sp. 29k: 0.06%
Azorhizobium doebereinerae UFLA1-100: 0.19%
Azorhizobium sp. AG788: 0.01%
Rhizobium sp. ACO-34A: 0.05%
Kaistia algarum: 0.02%
unclassified Mesorhizobium: 0.04%


Aquabacter spiritensis: 0.01%
Caulobacter sp. 602-1: 0.49%
Caulobacter segnis ATCC 21756: 0.03%
Caulobacter vibrioides OR37: 0.01%
Brevundimonas: 0.02%
Brevundimonas sp. M20: 0.01%
Phenylobacterium immobile (ATCC 35973): 0.02%
Marinicauda algicola: 0.01%
Rhizomicrobium sp. SCGC AG-212-E05: <0.01%
Mycolicibacterium sp. CH28: 0.98%
Mycobacterium sp. ENV421: 0.02%
Propionibacteriaceae: 0.31%
Cutibacterium acnes: 0.02%
Propionibacterium sp. HMSC065F07: 0.02%
Candidatus Microthrix parvicella RN1: 0.05%
Patulibacter: 0.01%
Streptococcus thermophilus LMD-9: 0.66%
Lactococcus lactis subsp. cremoris HP: 0.16%
Lactobacillus helveticus DPC 4571: 0.04%
Lactobacillus delbrueckii subsp. bulgaricus: <0.01%
Desulfosporosinus sp. Tol-M: 0.04%
Peptococcaceae bacterium SCADC1_2_3: 0.03%
unclassified Dehalobacter: 0.01%
Papillibacter cinnamivorans DSM 12816: 0.01%
[Clostridium] saccharolyticum WM1: <0.01%
Anaerosporomusa subterranea: 0.05%
Pelolinea submarina: 0.02%
Flexilinea flocculi: 0.01%
Levilinea saccharolytica: 0.01%
Dehalococcoides: <0.01%
Parcubacteria bacterium RAAC4_OD1_1: 0.12%
Parcubacteria bacterium SCGC AAA011-A08: 0.03%
Rectinema subterraneum: 0.06%
Leptospira kobayashii: 0.04%
Leptospira terpstrae serovar Hualin str. LT 11-33 = ATCC 700639: 0.02%
Geothrix fermentans DSM 14018: 0.1%
Chryseobacterium sp. SC28: 0.03%
Anaerophaga thermohalophila DSM 12881: 0.01%
Petrimonas sp. IBARAKI: 0.01%
Hydrotalea flava: 0.01%
Gemmatimonas: 0.02%
Candidatus Cryosericum hinesii: 0.04%
Rariglobus hedericola: 0.02%
unclassified Opitutaceae: <0.01%
unclassified Verrucomicrobia: <0.01%
Methanobacterium sp. Maddingley MBC34: <0.01%


Methanobacterium sp. Maddingley MBC34: <0.01%
unclassified Verrucomicrobia: <0.01%
Candidatus Cryosericum hinesii: 0.04%
Rariglobus hedericolus: 0.04%
unclassified Opitutaceae: 0.01%
Gemmatimonas: 0.02%
Candidatus Solibacter usitatus Ellin6076: 0.01%
Hydrocarboniphaga effusa AP103: 0.01%
Petrimonas sp. IBRBAK6: 0.01%
Geothrix fermentans DSM 12825: 0.03%
Chryseobacterium sp. SC28: 0.03%
Anaerophaga thermohalophila DSM 12881: 0.01%
Leptospira terpstrae serovar Hualin str. LT 11-33 = ATCC 700539: 0.02%
Leptospira kobayashii: 0.04%
Rectinema subterraneum: 0.06%
Paludibacterium purpuratum: 0.01%
Paludibacter sp. 47-120: 0.02%
Dehalococcoides: 0.01%
Levilinea saccharolytica: 0.01%
Flexilinea flocculi: 0.01%
Anaerosporomusa subterranea: 0.02%
[Clostridium] saccharolyticum WM1: <0.01%
unclassified Dehalobacter: 0.01%
Peptococcaceae bacterium SCADC1_2_3: 0.01%
Desulfosporosinus sp. Tol-M: 0.04%
Lactobacillus helveticus DPC 4571: 0.04%
Streptococcus thermophilus LMD-9: 0.66%
Patulibacter: 0.01%
Propionibacteriaceae: 0.31%
Cutibacterium acnes: 0.02%
Mycolicibacterium sp. ENV421: 0.02%
Rhizomicrobium sp. SCGC AG-212-E05: <0.01%
Marinicauda algicola: 0.01%
Brevundimonas sp. M20: 0.01%
Caulobacter vibrioides OR37: 0.01%
Caulobacter segnis ATCC 21756: 0.03%
Caulobacter sp. 602-1: 0.49%
Aquabacter spiritensis: 0.01%
unclassified Mesorhizobium: 0.04%
Kaistia algarum: 0.02%
Rhizobium sp. ACO-34A: 0.05%
Azorhizobium sp. AG788: 0.01%
Azorhizobium doebereinerae UFLA1-100: 0.19%
Xanthobacter sp. 29k: 0.06%
Xanthobacter autotrophicus PY2: 0.22%
Parvibaculum lavamentivorans DS-1: 0.02%
Parvibaculum sediminis: 0.96%
Rhodospirillales bacterium URHD0017: 0.04%
Rhodospirillales: 0.01%
Alphaproteobacteria: 0.02%
Reyranella soli: 0.04%
Reyranella massiliensis 521: 0.71%
Reyranella sp. CPCC 100927: 0.02%
Azospirillum doebereinerae: 0.02%
Ferrovibrio terrae: 0.02%
Azospirillum sp. TSH58: 0.02%
Magnetospirillum kuznetsovii: 0.04%
Magnetospirillum sp. SO-1: 0.04%
Magnetospirillum magneticum: 0.04%
Magnetospirillum moscoviense: 0.04%
Magnetospirillum magnetotacticum MS-1: 0.06%
Magnetospirillum gryphiswaldense MSR-1 v2: 0.1%
Magnetospirillum caucaseum: 0.06%
Magnetospirillum sp. 15-1: 0.04%
Humitalea rosea: 0.01%
Humitalea sp. KHK228: 0.01%
Oleomonas sp. MX-Z02: 0.02%
Acidocella sp. 101 + DSM 11237: 0.02%
Acidocella aminolytica 101 = ATCC 700191: 0.04%
Acidocella facilis ATCC 35904: 0.08%
Zavarzinia compransoris: 0.08%
Zavarzinia aquatilis: 0.76%
Erythrobacter rubeus DSM 12079: 0.01%
Sphingomonas echinoides ATCC 14820: 0.02%
Sphingomonas mali NBRC 15500: 0.02%
Sphingomonas panaciterrae: 0.02%
Sphingomonas sp. HH1: 0.02%
Sphingobium baderi LLAP10: 0.27%
Sphingobium sp. TKS: 1.81%
Sphingobium yanoikuyae: 0.35%
Nevskia ramosa DSM 11499: 0.27%
Nevskia soli DSM 19509: 0.27%
Solimonas flava DSM 13987: 0.03%
Solimonas soli DSM 19508: 0.04%
Solimonas variicoloris DSM 15731: 0.07%
Solimonas aquatica: 0.79%
Pseudogulbenkiania: 0.01%
Pseudogulbenkiania ferrooxidans: 0.01%
Pseudogulbenkiania subflava: 0.01%
Pseudogulbenkiania sp. NH8B: 0.01%
Pseudomonas: 0.01%
Pseudomonas moorei: 0.03%
Pseudomonas sp. DP1160: 0.03%
Pseudomonas sp. DP1160 pv1: 0.08%
Pseudomonas veronii 1YdBTEX2: 0.12%
Pseudomonas aeruginosa: 2.12%
Pseudomonas extremaustralis 143 substr. 143b: 2.72%
Dyella ginsengisoli LA-4: 0.02%
Luteibacter: 0.05%
Stenotrophomonas sp. UNCMF366TSI5.1: 0.19%
Stenotrophomonas rhizophila: 0.02%
Pseudoxanthomonas spadix BD-a59: 1.92%
Sulfuricaulis limicola: <0.01%
Sulfuricaulis limnaeus DSM 17445: 0.65%
Sulfuricaulis limnaeus DSM 17446: <0.01%
Sulfuricaulis limnaeus DSM 13726: 0.02%
Desulfobacula: <0.01%
Desulfobulbus sp. Tol-SR: 29.34%
Desulfobulbus: <0.01%
Desulfobulbaceae bacterium DSM 17038: 0.06%
Desulfobulbus propionicus DSM 2379: 0.03%
Desulfobulbus sp. F21: 2.98%
Desulfobulbus elongatus DSM 6908: 0.08%
Desulfobulbus rhabdoformis: 0.02%
Desulfobulbus mediterraneus: 0.06%
Desulfobulbus japonicus: <0.01%
Desulfobulbus propionicus: <0.01%
Desulfobulbaceae bacterium: <0.01%
Geobacter bemidjiensis Bem: 0.08%
Geobacter sp. M18: 0.08%
Geobacter metallireducens: 0.06%
Geobacter sp. M21: 0.08%
Geobacter lovleyi SZ: 0.08%
Geobacter sp. FRC-32: 0.08%
Geobacter sp. OR-1: 0.08%
Geobacter sulfurreducens: 0.08%
Geobacter sp. DSM 9736: 0.08%
Geobacter sp. M18: 0.08%
Candidatus Desulfofervidus auxilii: 0.08%
Desulfuromonas: 0.08%
Desulfuromonas soudanensis: 0.08%
Desulfuromonas sp. DDH964: 0.08%
Desulfuromonas acetoxidans DSM 684: 0.08%
Desulfuromonas thiophila: 0.02


29.34% - Desulfobulbus sp. Tol-SR
2.38% - Smithella sp. F21
7.92% - Pseudoxanthomonas spadix BD-a59
2.72% - Pseudomonas extremaustralis 14-3 substr. 14-3b
2.12% - Pseudomonas aeruginosa
1.81% - Sphingobium sp. TKS
Acidovorax sp. T1 - 20.4%
Acidovorax carolinensis - 3.71%
Extensimonas perlucida - 5.15%
Herbaspirillum sp. RV1423 - 1.04%
Zoogloea oleivorans - 3.88%
Bacteria
Proteobacteria
unclass..obulbus
Desulfobulbus
Desulfobulbaceae
Desulfo..terales
Deltapr..acteria
delta/e..visions
Betapro..acteria
Burkholderiales
Comamonadaceae
Acidovorax
unclass..dovorax
Gammapr..acteria
Xanthomonadales
Xanth..aceae
Pseudo..omonas
Pseudo..spadix
Alp..ria
5 more
28 more
3 more
6 more
2 more
8 more
10 more
22 more


Pseudomonas extrem
Smithella sp. F21
Acidovorax carolinens
Pseudomonas aeru
Streptoco
Azospir
Cauloba
Zavarzini
Aquabac
Zoogloea oleivorans:
Solimonas
Azor
Azospir
Sphingobium sp
Sulfuricur
Azovi
Polaro
Herbaspiril
Legion
Extensimonas perlucida: 5
Rhodo
Acidovorax
Sphin
Cupria
Mycoliciba
Luteibacte
Nevsk
Cupri
Magnet
Propio
Aquabacter
Parvibacul
Sphingomon
Desulfobulbus sp. Tol-SR: 29.34%
Pseudoxanthomonas spadix BD-a59
Acidovorax sp. T1: 20.4%

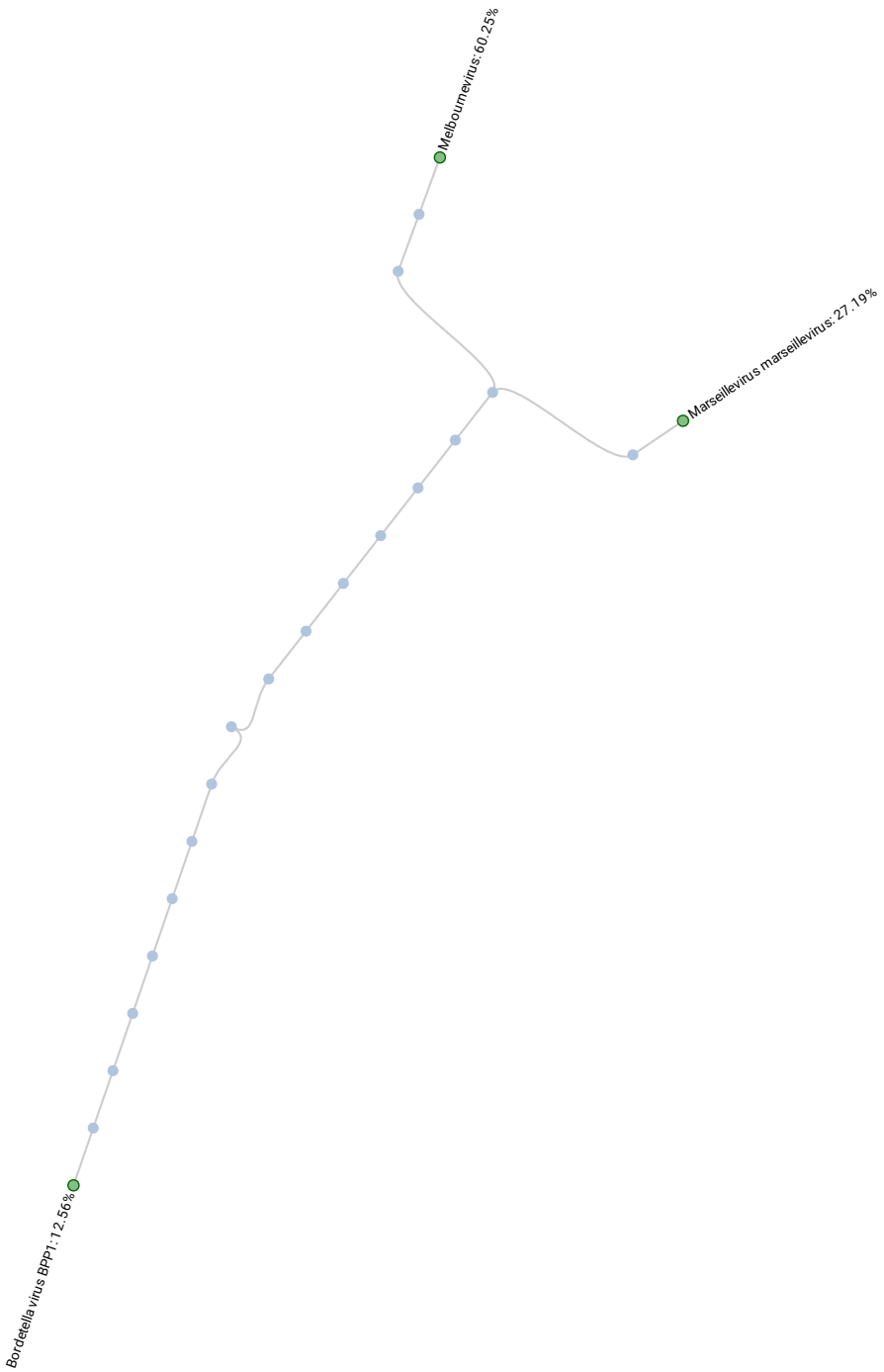
Fasta/q details

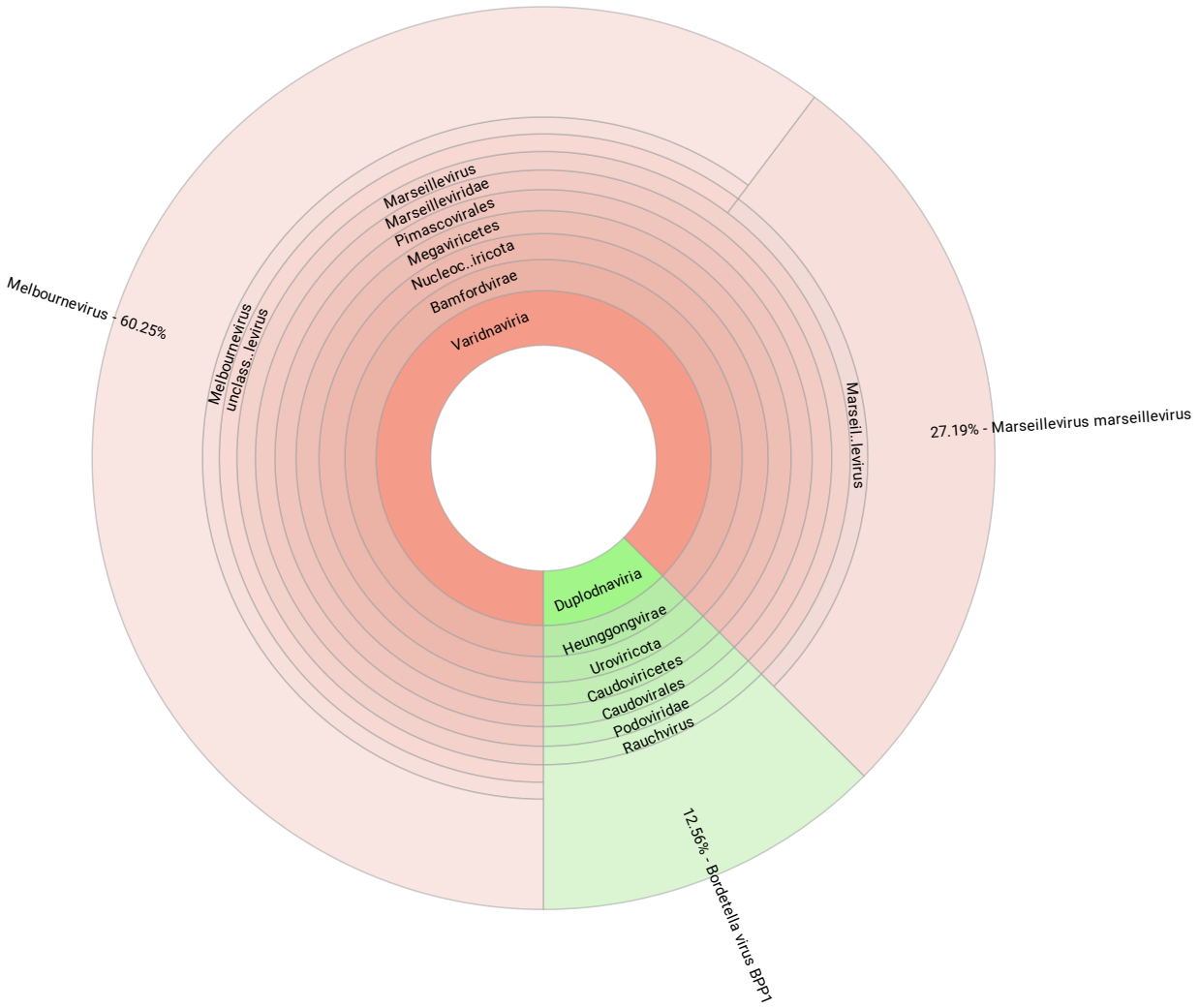
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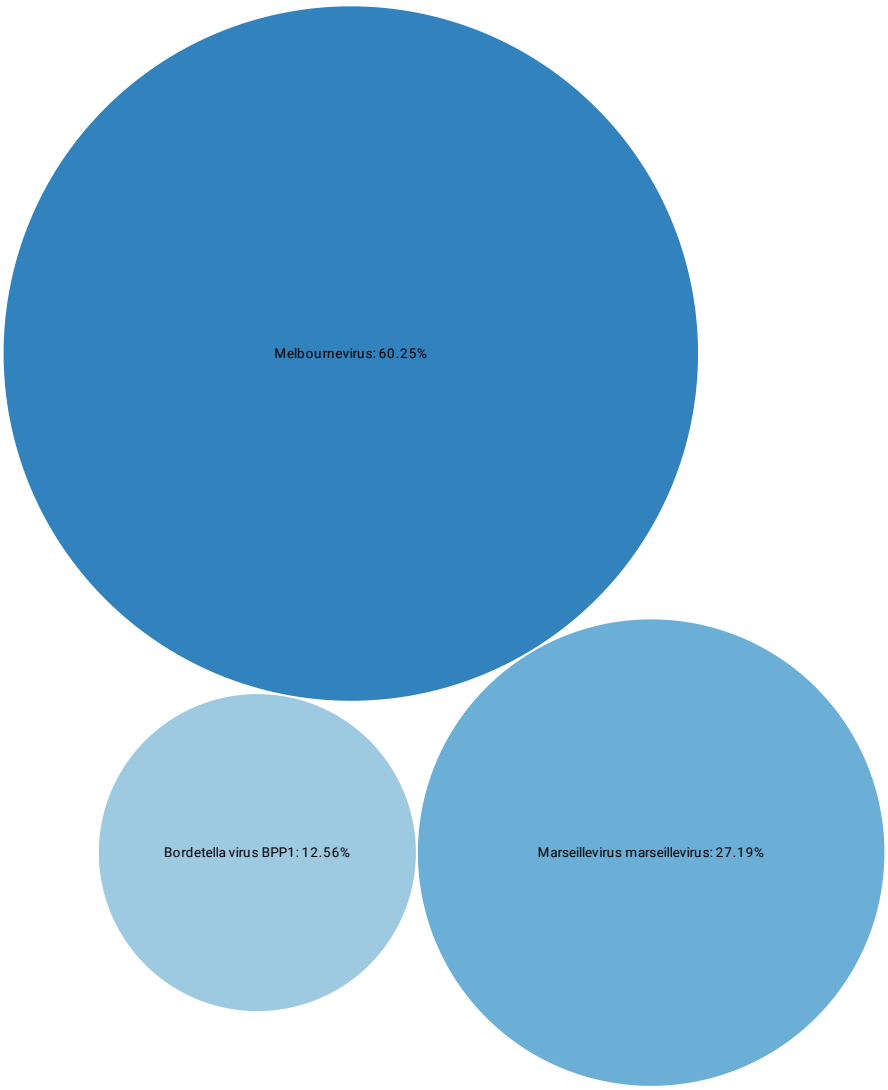
Table

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Melbournevirus	1560514	45.05	60.25%	0.63	0.79	610
Marseillevirus marseillevirus	694581	20.33	27.19%	0.27	0.62	428
Bordetella virus BPP1	194699	9.39	12.56%	0.25	0.25	70


Melbournevirus: 60.25%
Marseillevirus marseillevirus: 27.19%
Bordetella virus BPP1: 12.56%


Melbournevirus: 60.25%
Marseillevirus marseillevirus: 27.19%
Bordetella virus BPP1: 12.56%


Melbournevirus - 60.25%
Melbournevirus unclass..levirus
Marseillevirus
Marseilleviridae
Pimascovirales
Megaviricetes
Nucleoc..iricota
Bamfordvirae
Varidnaviria
Marseil..levirus
27.19% - Marseillevirus marseillevirus
Duplodnaviria
Heunggongvirae
Uroviricota
Caudoviricetes
Caudovirales
Podoviridae
Rauchvirus
12.56% - Bordetella virus BPP1

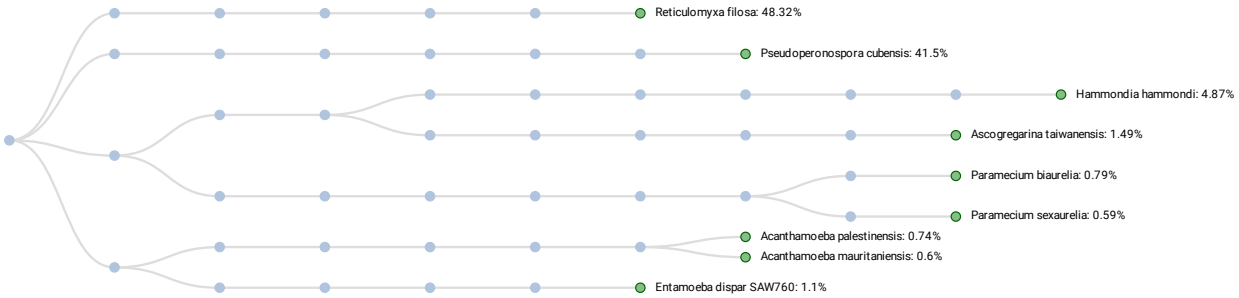

Melbournevirus: 60.25%
Bordetella virus BPP1: 12.56%
Marseillevirus marseillevirus: 27.19%

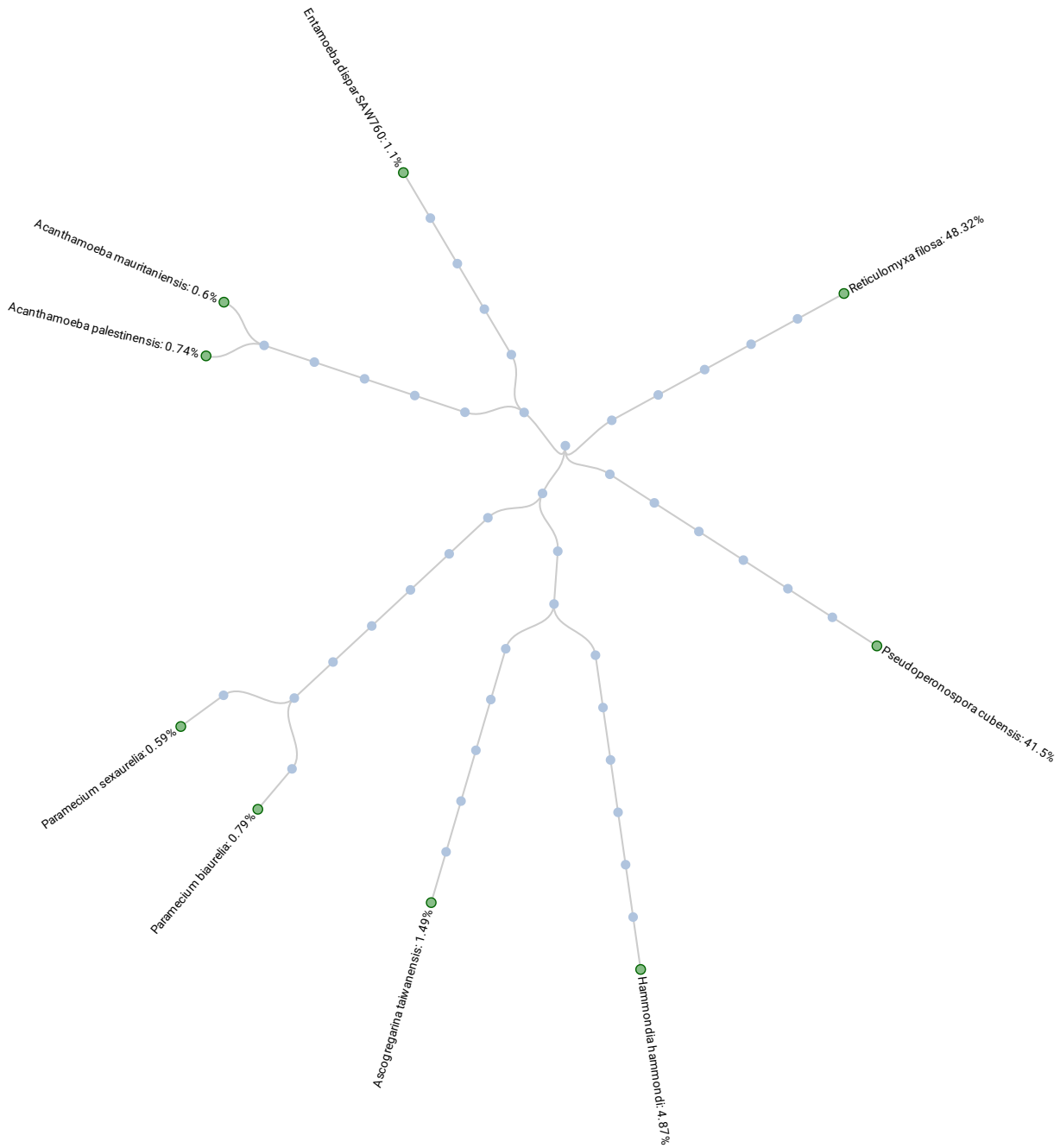
Fasta/q details

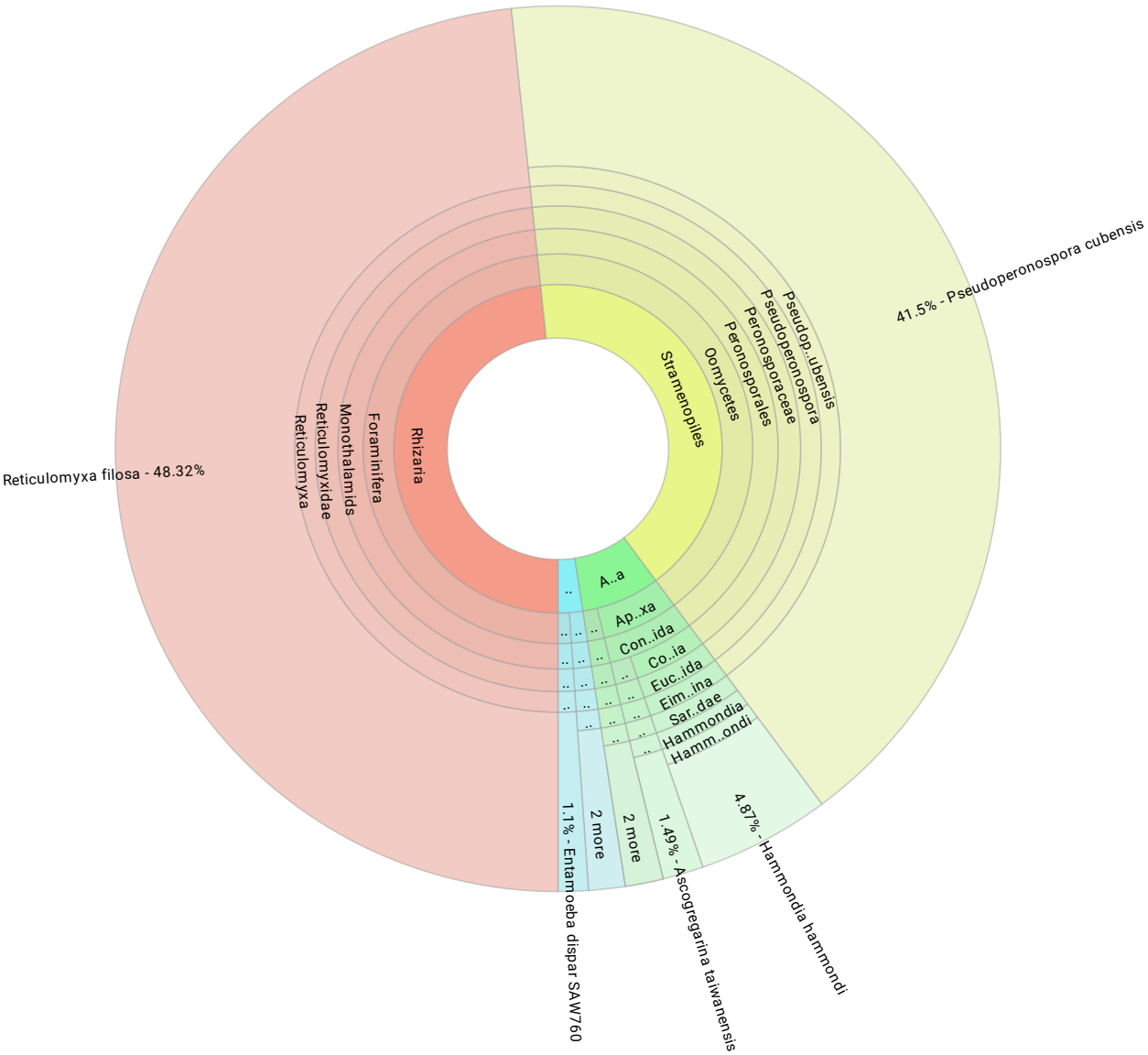
Name	Value
Hit	6205

Table

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Reticulomyxa filosa	46433	37.87	48.32%	0.32	0.34	1964
Pseudoperonospora cubensis	143453	32.53	41.50%	0.28	0.33	1718
Hammondia hammondi	99158	3.82	4.87%	0.06	0.05	180
Ascogregarina taiwanensis	158379	1.17	1.49%	0.02	0.02	94
Entamoeba dispar SAW760	370354	0.86	1.10%	0.03	0.03	59
Paramecium biaurelia	65126	0.62	0.79%	0.01	0.01	56
Acanthamoeba palestinensis	28015	0.58	0.74%	0.01	0.05	42
Acanthamoeba mauritaniensis	196912	0.47	0.60%	0.01	0.02	33
Paramecium sexaurelia	65128	0.46	0.59%	0.01	0.02	107


Reticulomyxa filosa: 48.32%
Pseudoperonospora cubensis: 41.5%
Hammondia hammondi: 4.87%
Ascogregarina taiwanensis: 1.49%
Paramecium biaurelia: 0.79%
Paramecium sexaurelia: 0.59%
Acanthamoeba palestinensis: 0.74%
Acanthamoeba mauritaniensis: 0.6%
Entamoeba dispar SAW760: 1.1%


Entamoeba dispar SAW760: 1.1%
Acanthamoeba mauritaniensis: 0.6%
Acanthamoeba palestinensis: 0.74%
Reticulomyxa filosa: 48.32%
Pseudoperonospora cubensis: 41.5%
Paramecium sexaurelia: 0.59%
Paramecium biaurelia: 0.79%
Ascogregarina taiwanensis: 1.49%
Hammondia hammondi: 4.87%


Reticulomyxa filosa - 48.32%
Reticulomyxa
Reticulomyxidae
Monothalamids
Foraminifera
Rhizaria
41.5% - Pseudoperonospora cubensis
Pseudop..ubensis
Pseudoperonospora
Peronosporaceae
Peronosporales
Oomycetes
Stramenopiles
A..a
Ap..xa
Con..ida
Co..ia
Euc..ida
Elm..ina
Sar..dae
Hammondia
Hamm..ondi
4.87% - Hammondia hammondi
1.49% - Ascogregarina taiwanensis
2 more
2 more
1.1% - Entamoeba dispar SAW760

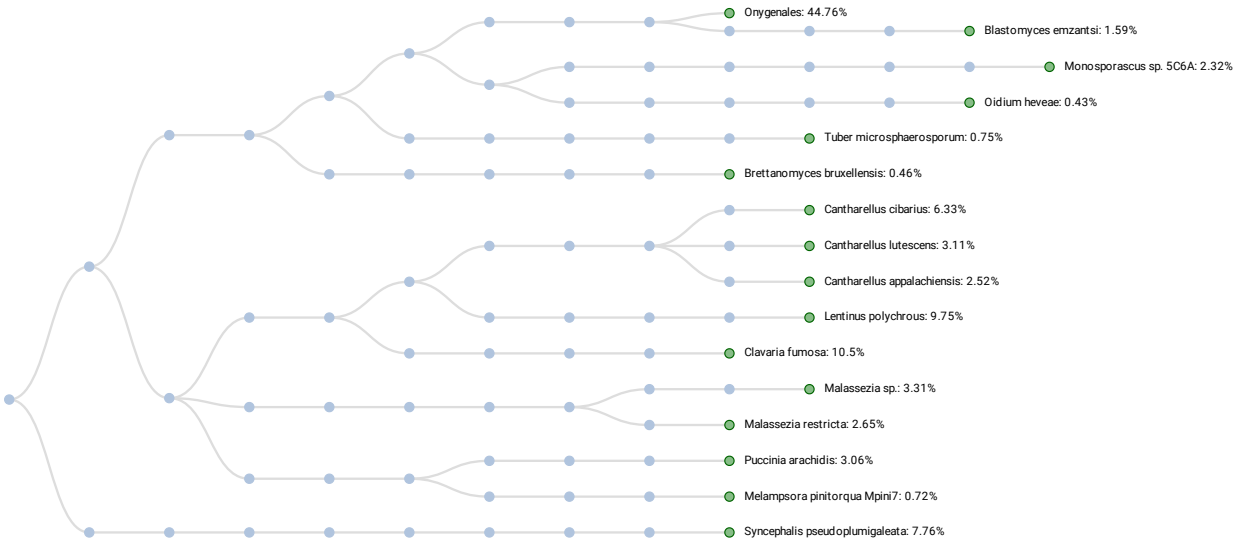

Reticulomyxa filosa: 48.32%
Pseudoperonospora cubensis: 41.5%
Parameciu
Acanthamo
Parameci
Acantham
Entamoeba d
Ascogregarina
Hammondia hammondi: 4.8

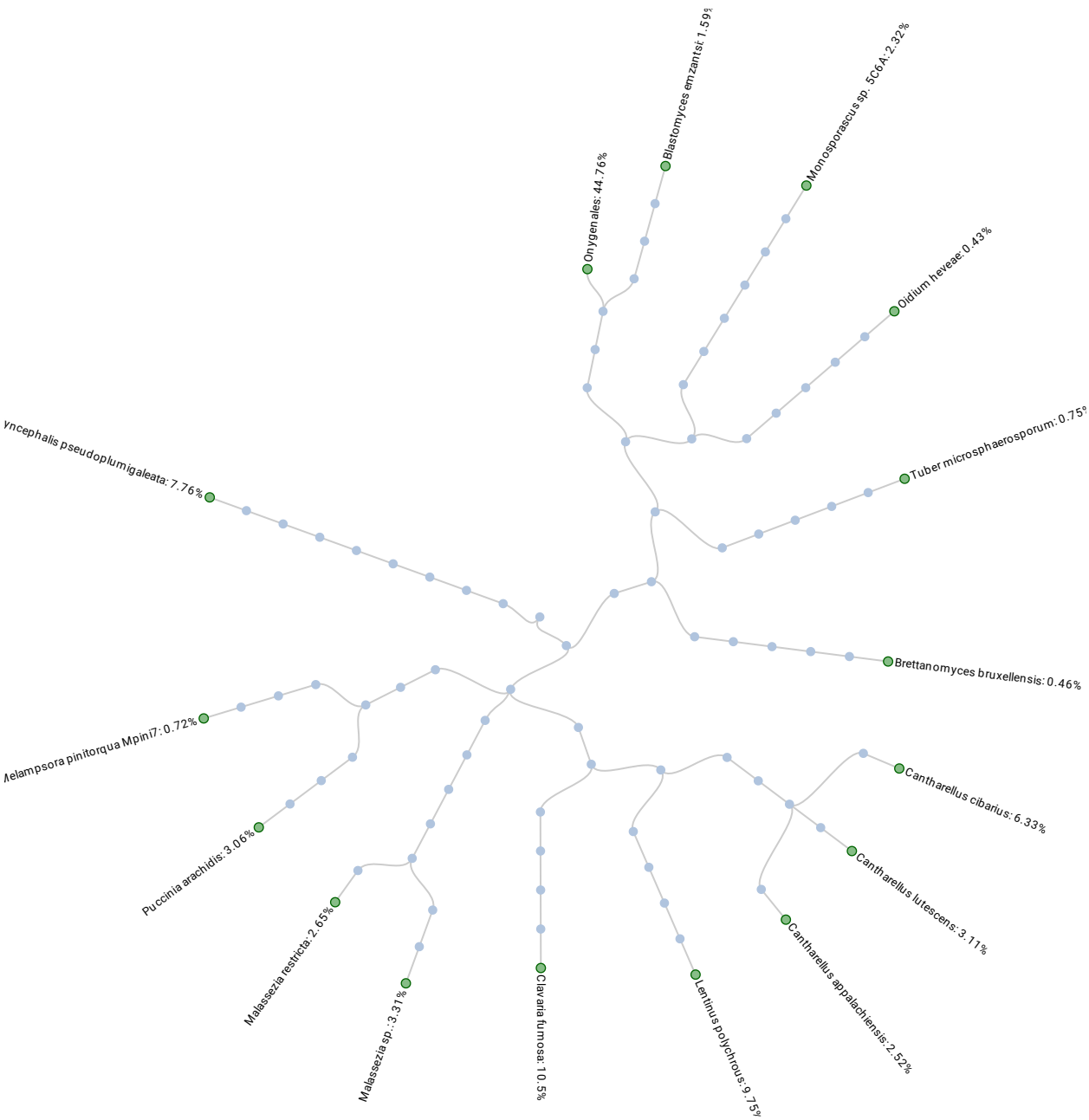
Fasta/q details

Name	Value
Hit	13266

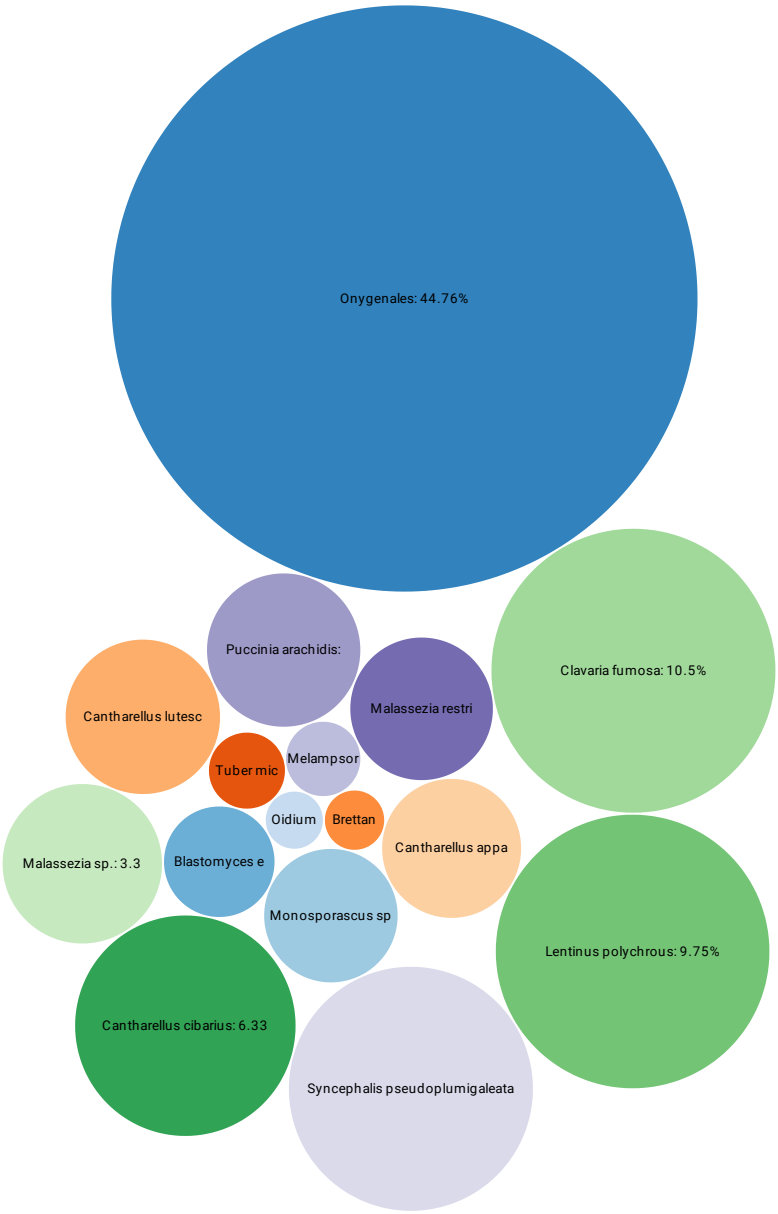
Table

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Onygenales	33183	41.09	44.76%	0.26	0.36	1900
Clavaria fumosa	264083	9.64	10.50%	0.11	0.74	537
Lentinus polychrous	292559	8.95	9.75%	0.10	0.17	528
Syncephalis pseudoplumigaleata	1712513	7.12	7.76%	0.13	0.13	830
Cantharellus cibarius	36066	5.81	6.33%	0.08	0.11	312
Malassezia sp.	2011732	3.04	3.31%	0.06	0.08	68
Cantharellus lutescens	104198	2.85	3.11%	0.05	0.83	165
Puccinia arachidis	333523	2.81	3.06%	0.04	0.10	189
Malassezia restricta	76775	2.43	2.65%	0.04	0.07	99
Cantharellus appalachiensis	409893	2.31	2.52%	0.04	0.77	149
Monosporascus sp. 5C6A	2211642	2.13	2.32%	0.03	0.05	184
Blastomyces emzantsi	2723674	1.46	1.59%	0.03	0.02	92
Tuber microsphaerosporum	1455713	0.69	0.75%	0.02	0.02	50
Melampsora pinitorqua Mpini7	1298852	0.66	0.72%	0.01	0.02	50
Brettanomyces bruxellensis	5007	0.42	0.46%	0.01	0.01	33
Oidium heveae	299130	0.39	0.43%	0.01	0.03	26


Onygenales: 44.76%
Blastomyces emzantsi: 1.59%
Monosporascus sp. 5C6A: 2.32%
Oidium heveae: 0.43%
Tuber microsphaerosporum: 0.75%
Brettanomyces bruxellensis: 0.46%
Cantharellus cibarius: 6.33%
Cantharellus lutescens: 3.11%
Cantharellus appalachiensis: 2.52%
Lentinus polychrous: 9.75%
Clavaria fumosa: 10.5%
Malassezia sp.: 3.31%
Malassezia restricta: 2.65%
Puccinia arachidis: 3.06%
Melampsora pinitorqua Mpini7: 0.72%
Syncephalis pseudoplumigaleata: 7.76%


Blastomyces emzantsi: 1.59%
Monosporascus sp. 5C6A: 2.32%
Onygenales: 44.76%
Oidium heveae: 0.43%
Tuber microsphaerosporum: 0.75%
Brettanomyces bruxellensis: 0.46%
Cantharellus cibarius: 6.33%
Cantharellus lutescens: 3.11%
Cantharellus appalachiensis: 2.52%
Lentinus polychrous: 9.75%
Clavaria fumosa: 10.5%
Malassezia sp.: 3.31%
Malassezia restricta: 2.65%
Puccinia arachidis: 3.06%
Melampsora pinitorqua Mpini7: 0.72%
Yncephalis pseudoplumigaleata: 7.76%


Blastomyces emzantsi - 1.59%
Monosporascus sp. 5C6A - 2.32%
6.33% - Cantharellus cibarius
3.11% - Cantharellus lutescens
2.52% - Cantharellus appalachiensis
9.75% - Lentinus polychrous
10.5% - Clavaria fumosa
3.31% - Malassezia sp.
2.65% - Malassezia restricta
3.06% - Puccinia arachidis
7.76% - Syncephalis pseudoplumigaleata
Onygenales - 44.76%
Dikarya
Basidiomycota
Agaricomycotina
Agaricomycetes
Polyporales
Polyporaceae
Lentinus
Agaricales
Clavariaceae
Clavaria
Cantharellales
Cantharellaceae
Cantharellus
Ascomycota
saccharomyceta
Pezizomycotina
leotiomyceta
Eurotiomycetes
Eurotiales
Onygenales
F..s
Zoopagales
Pipto..aceae
Syncephalis
Malassezia

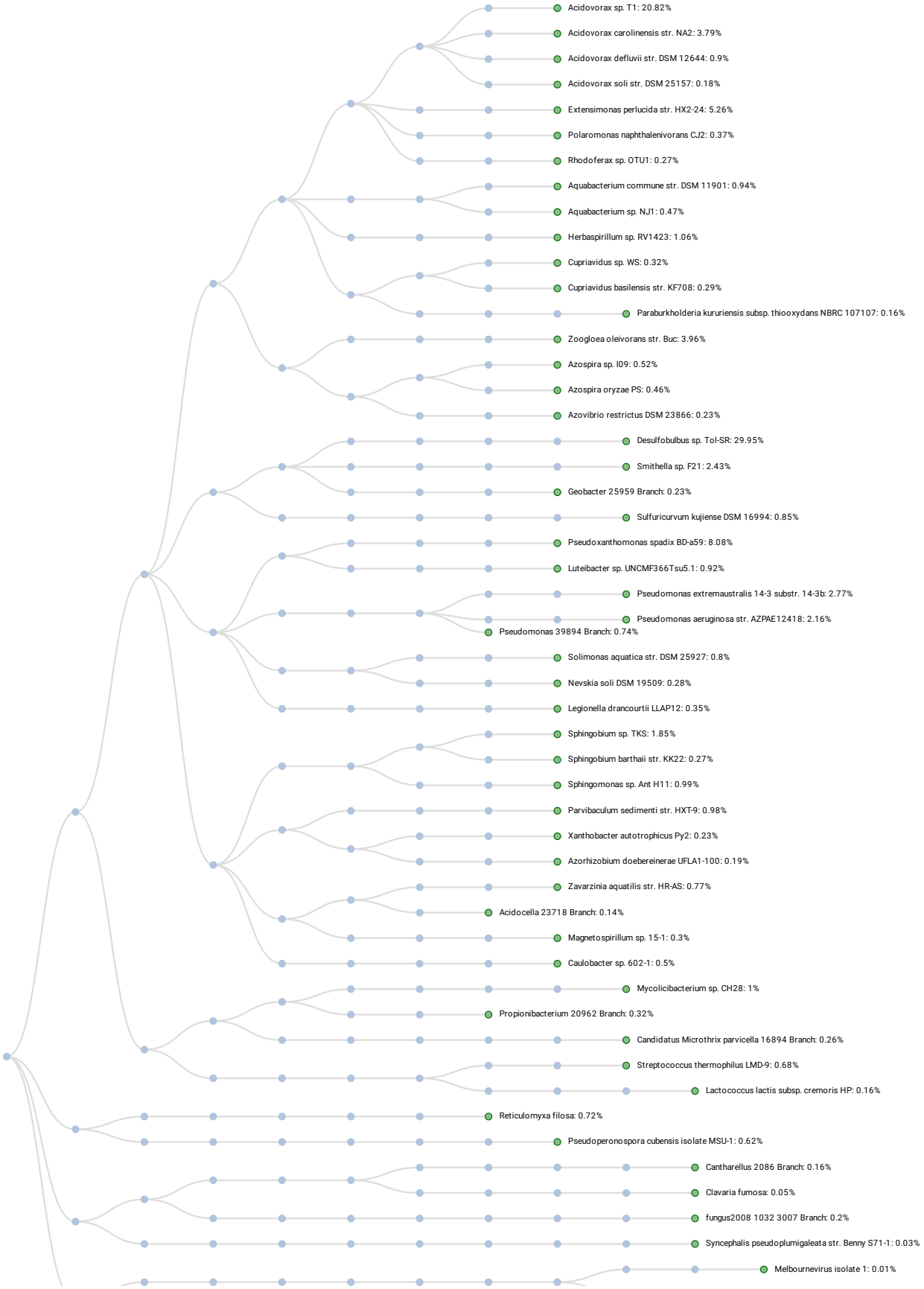

Onygenales: 44.76%
Puccinia arachidis:
Clavaria fumosa: 10.5%
Cantharellus lutesc
Malassezia restri
Tuber mic
Melampsor
Oidium
Brettan
Malassezia sp.: 3.3
Blastomyces e
Cantharellus appa
Monosporascus sp
Lentinus polychrous: 9.75%
Cantharellus cibarius: 6.33
Syncephalis pseudoplumigaleata

Table

Table

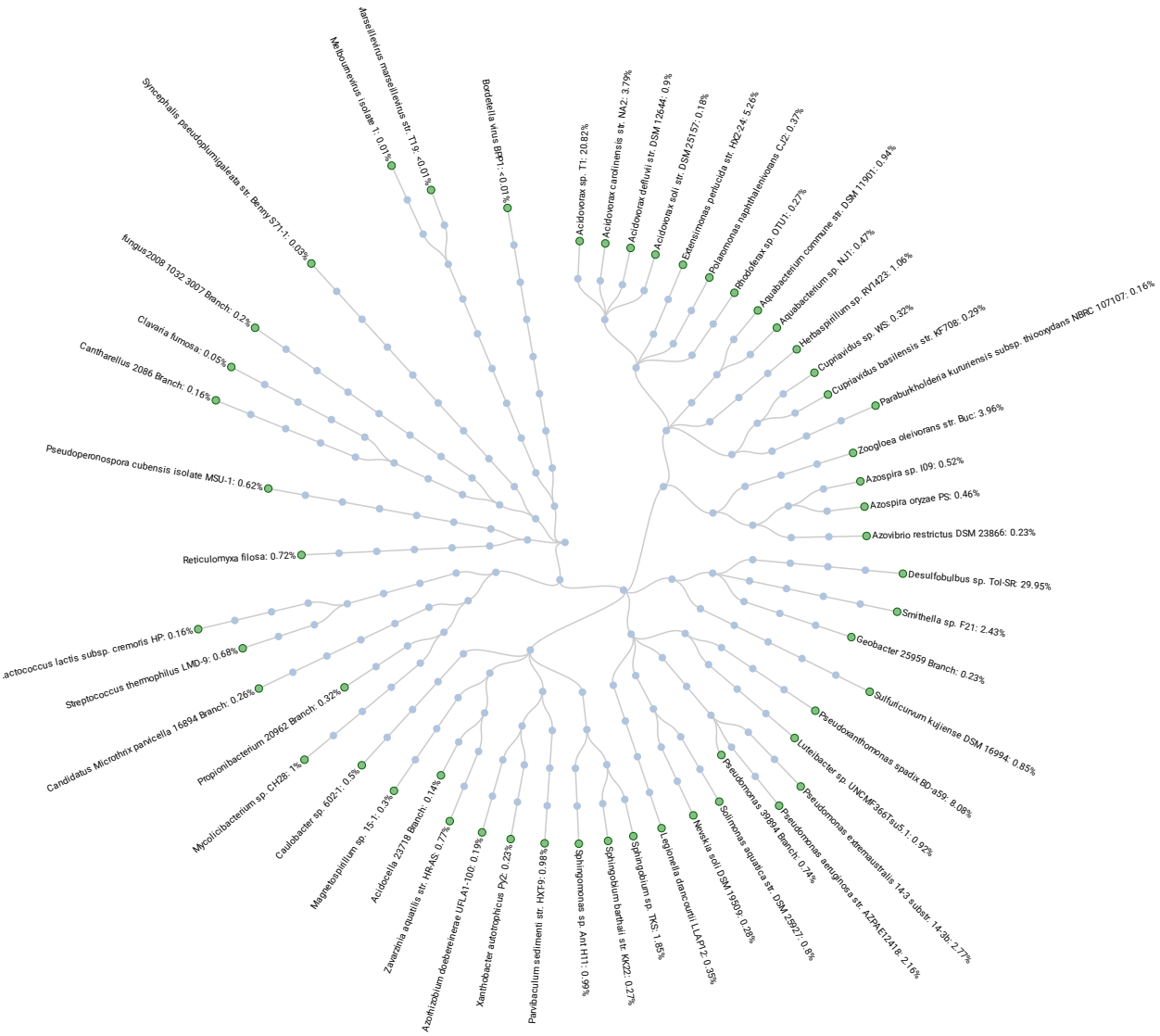
Name	Taxonomy Id	Kingdom	Unified RA	% Unique Matches	% Total Matches
Desulfobulbus sp. Tol-SR	1536652	Bacteria	29.95%	76.73	76.73
Acidovorax sp. T1	1858609	Bacteria	20.82%	37.54	52.32
Pseudoxanthomonas spadix BD-a59	1045855	Bacteria	8.08%	31.30	31.35
Extensimonas perlucida	2590786	Bacteria	5.26%	21.25	21.17
Zoogloea oleivorans	1552750	Bacteria	3.96%	16.59	16.38
Acidovorax carolinensis	553814	Bacteria	3.79%	4.41	11.82
Pseudomonas extremaustralis 14-3 substr. 14-3b	1117958	Bacteria	2.77%	12.19	12.18
Smithella sp. F21	1538640	Bacteria	2.43%	12.33	12.33
Pseudomonas aeruginosa	287	Bacteria	2.16%	35.99	12.11
Sphingobium sp. TKS	1315974	Bacteria	1.85%	7.35	6.88
Herbaspirillum sp. RV1423	1443993	Bacteria	1.06%	5.20	5.20
Mycolicibacterium sp. CH28	2512237	Bacteria	1.00%	5.03	5.02
Sphingomonas sp. Ant H11	1564113	Bacteria	0.99%	18.31	3.65
Parvibaculum sedimenti	2608632	Bacteria	0.98%	4.85	4.87
Aquabacterium commune	70586	Bacteria	0.94%	4.34	4.48
Luteibacter sp. UNCMF366Tsu5.1	1502758	Bacteria	0.92%	4.56	4.57
Acidovorax defluvii	86669	Bacteria	0.90%	1.26	3.26
Sulfuricurvum kujiense DSM 16994	709032	Bacteria	0.85%	4.62	4.72
Solimonas aquatica	489703	Bacteria	0.80%	4.12	4.10
Zavarzinia aquatilis	2211142	Bacteria	0.77%	3.59	3.73
Pseudomonas	286	Bacteria	0.74%	3.26	3.26
Reticulomyxa filosa	46433	Protists	0.72%	0.32	0.34
Streptococcus thermophilus LMD-9	322159	Bacteria	0.68%	1.17	4.58
Pseudoperonospora cubensis	143453	Protists	0.62%	0.28	0.33
Azospira sp. I09	1765049	Bacteria	0.52%	1.32	2.78
Caulobacter sp. 602-1	2492472	Bacteria	0.50%	2.31	2.59
Aquabacterium sp. NJ1	1538295	Bacteria	0.47%	2.56	2.57
Azospira oryzae PS	640081	Bacteria	0.46%	1.16	2.52
Polaromonas naphthalenivorans CJ2	365044	Bacteria	0.37%	1.61	1.86
Legionella drancourtii LLAP12	658187	Bacteria	0.35%	2.25	2.23
Cupriavidus sp. WS	1312922	Bacteria	0.32%	1.45	2.77
Propionibacteriaceae	31957	Bacteria	0.32%	4.26	3.81
Magnetospirillum sp. 15-1	1979370	Bacteria	0.30%	1.22	1.63
Cupriavidus basilensis	68895	Bacteria	0.29%	1.37	2.68

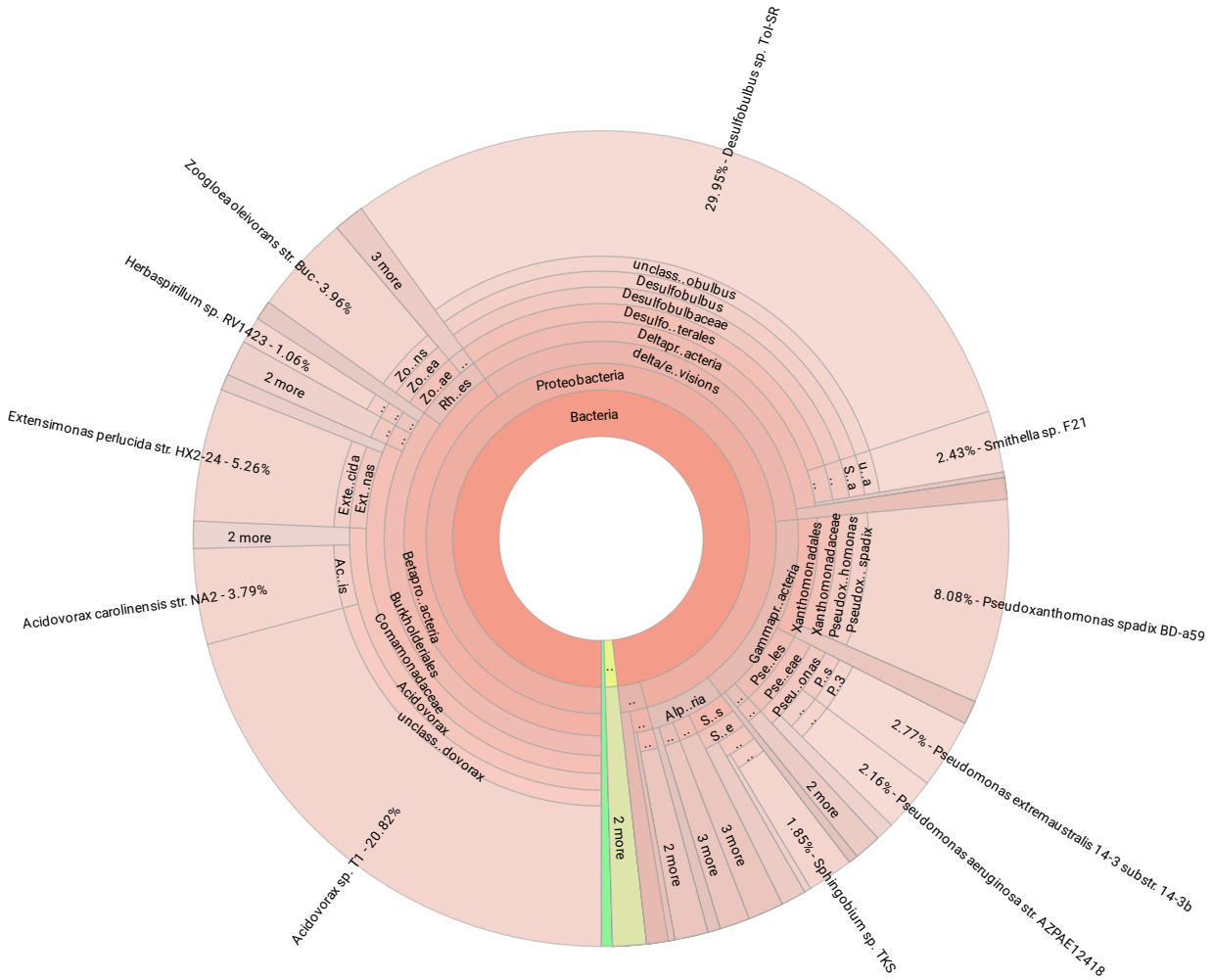
Name	Taxonomy Id	Kingdom	Unified RA	% Unique Matches	% Total Matches
Nevskia soli DSM 19509	1122604	Bacteria	0.28%	1.55	1.55
Sphingobium barthaii	1054037	Bacteria	0.27%	1.52	1.22
Rhodoferax sp. OTU1	2109322	Bacteria	0.27%	1.09	1.18
Candidatus Microthrix parvicella	41950	Bacteria	0.26%	0.97	0.97
Azovibrio restrictus DSM 23866	1121035	Bacteria	0.23%	0.91	0.92
Geobacter	28231	Bacteria	0.23%	2.57	2.57
Xanthobacter autotrophicus Py2	78245	Bacteria	0.23%	1.00	1.26
Onygenales	33183	Fungi	0.20%	0.26	0.36
Azorhizobium doebereinerae UFLA1-100	1038858	Bacteria	0.19%	1.10	1.14
Acidovorax soli	592050	Bacteria	0.18%	0.83	1.51
Lactococcus lactis subsp. cremoris HP	1295827	Bacteria	0.16%	1.29	1.28
Paraburkholderia kururiensis subsp. thiooxydans NBRC 107107	1218081	Bacteria	0.16%	0.95	1.10
Cantharellus	36065	Fungi	0.16%	2.06	2.06
Acidocella	50709	Bacteria	0.14%	17.05	17.05
Clavaria fumosa	264083	Fungi	0.05%	0.11	0.74
Syncephalis pseudoplumigaleata	1712513	Fungi	0.03%	0.13	0.13
Melbournevirus	1560514	Viruses	0.01%	0.63	0.79
Marseillevirus marseillevirus	694581	Viruses	<0.01%	0.27	0.62
Bordetella virus BPP1	194699	Viruses	<0.01%	0.25	0.25

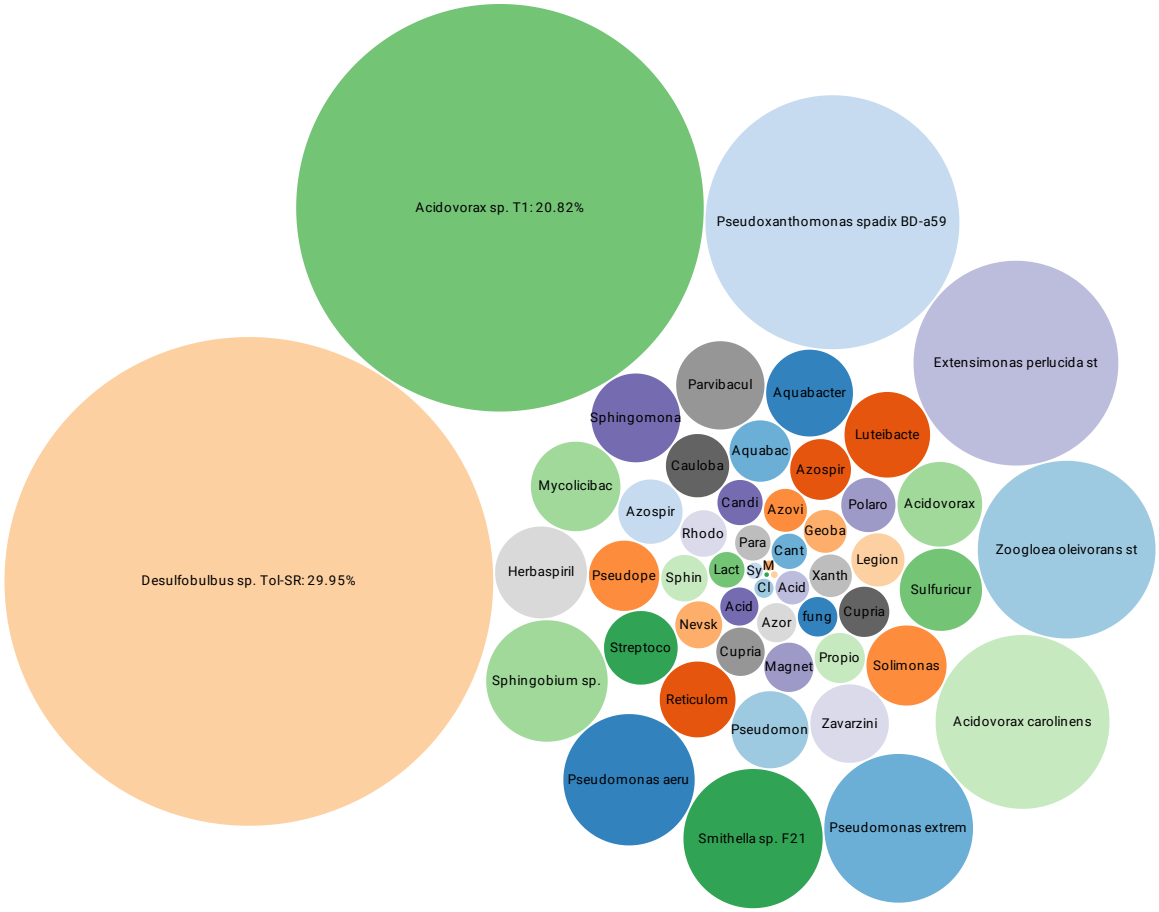

Acidovorax sp. T1: 20.82%
Acidovorax carolinensis str. NA2: 3.79%
Acidovorax defluvii str. DSM 12644: 0.9%
Acidovorax soli str. DSM 25157: 0.18%
Extensimonas perlucida str. HX2-24: 5.26%
Polaromonas naphthalenivorans CJ2: 0.37%
Rhodoferax sp. OTU1: 0.27%
Aquabacterium commune str. DSM 11901: 0.94%
Aquabacterium sp. NJ1: 0.47%
Herbaspirillum sp. RV1423: 1.06%
Cupriavidus sp. WS: 0.32%
Cupriavidus basilensis str. KF708: 0.29%
Paraburkholderia kururiensis subsp. thiooxydans NBRC 107107: 0.16%
Zoogloea oleivorans str. Buc: 3.96%
Azospira sp. I09: 0.52%
Azospira oryzae PS: 0.46%
Azovibrio restrictus DSM 23866: 0.23%
Desulfobulbus sp. Tol-SR: 29.95%
Smithella sp. F21: 2.43%
Geobacter 25959 Branch: 0.23%
Sulfuricurvum kujiense DSM 16994: 0.85%
Pseudoxanthomonas spadix BD-a59: 8.08%
Luteibacter sp. UNCMF366Tsu5.1: 0.92%
Pseudomonas extremaustralis 14-3 substr. 14-3b: 2.77%
Pseudomonas aeruginosa str. AZPAE12418: 2.16%
Pseudomonas 39894 Branch: 0.74%
Solimonas aquatica str. DSM 25927: 0.8%
Nevskia soli DSM 19509: 0.28%
Legionella drancourtii LLAP12: 0.35%
Sphingobium sp. TKS: 1.85%
Sphingobium barthaii str. KK22: 0.27%
Sphingomonas sp. Ant H11: 0.99%
Parvibaculum sedimenti str. HXT-9: 0.98%
Xanthobacter autotrophicus Py2: 0.23%
Azorhizobium doebereinerae UFLA1-100: 0.19%
Zavarzinia aquatilis str. HR-AS: 0.77%
Acidocella 23718 Branch: 0.14%
Magnetospirillum sp. 15-1: 0.3%
Caulobacter sp. 602-1: 0.5%
Mycolicibacterium sp. CH28: 1%
Propionibacterium 20962 Branch: 0.32%
Candidatus Microthrix parvicella 16894 Branch: 0.26%
Streptococcus thermophilus LMD-9: 0.68%
Lactococcus lactis subsp. cremoris HP: 0.16%
Reticulomyxa filosa: 0.72%
Pseudoperonospora cubensis isolate MSU-1: 0.62%
Cantharellus 2086 Branch: 0.16%
Clavaria fumosa: 0.05%
fungus2008 1032 3007 Branch: 0.2%
Syncephalis pseudoplumigaleata str. Benny S71-1: 0.03%
Melbournevirus isolate 1: 0.01%


Marseillevirus marseillevirus str. T19: <0.01%
Bordetella virus BPP1: <0.01%

Radial Tree Chart




29.95% - Desulfobulbus sp. Tol-SR
Zoogloea oleivorans str. Buc - 3.96%
3 more
Herbaspirillum sp. RV1423 - 1.06%
2 more
Extensimonas perlucida str. HX2-24 - 5.26%
2 more
Acidovorax carolinensis str. NA2 - 3.79%
Acidovorax sp. T1 - 20.82%
2 more
2 more
3 more
2 more
1.85% - Sphingobium sp. TKS
2.16% - Pseudomonas aeruginosa str. AZPAE12418
2.77% - Pseudomonas extremaustralis 14-3 substr. 14-3b
8.08% - Pseudoxanthomonas spadix BD-a59
2.43% - Smithella sp. F21
unclass...obulbus
Desulfobulbus
Desulfobulbaceae
Desulfo...terales
Deltapr...acteria
delta/e...visions
Proteobacteria
Bacteria
Zo...ns
Zo...ea
Zo...ae
Rh...es
Exte...cida
Ext...nas
Betapr...acteria
Burkholderiales
Comamonadaceae
Acidovorax
unclass...dovorax
Gammapr...acteria
Xanthomonadales
Xanthomonadaceae
Pseudox...homonas
Pseudox...spadix
Alp...ria
Pse...les
Pse...eae
Pseu...onas


Acidovorax sp. T1: 20.82%
Pseudoxanthomonas spadix BD-a59
Extensimonas perlucida st
Desulfobulbus sp. Tol-SR: 29.95%
Parvibacul
Aquabacter
Sphingomona
Luteibacte
Aquabac
Cauloba
Azospir
Mycolicibac
Candi
Azovi
Polaro
Acidovorax
Azospir
Rhodo
Geoba
Para
Cant
Zoogloea oleivorans st
Herbaspiril
Pseudope
Sphin
Lact
Sy
M
Cl
Acid
Xanth
Legion
Sulfuricur
Acid
Azor
fung
Cupria
Nevsk
Streptoco
Cupria
Magnet
Propio
Solimonas
Sphingobium sp.
Reticulom
Pseudomon
Zavarzini
Acidovorax carolinens
Pseudomonas aeru
Smithella sp. F21
Pseudomonas extrem

Fasta/q details

Name	Value
Hit	130

Table

Name	Accession ID	Class	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Aminoglycoside GENE aadA1 1 X02340	X02340	Aminoglycoside	789.74	100.00%	35.94	10.36	127

Fasta/q details

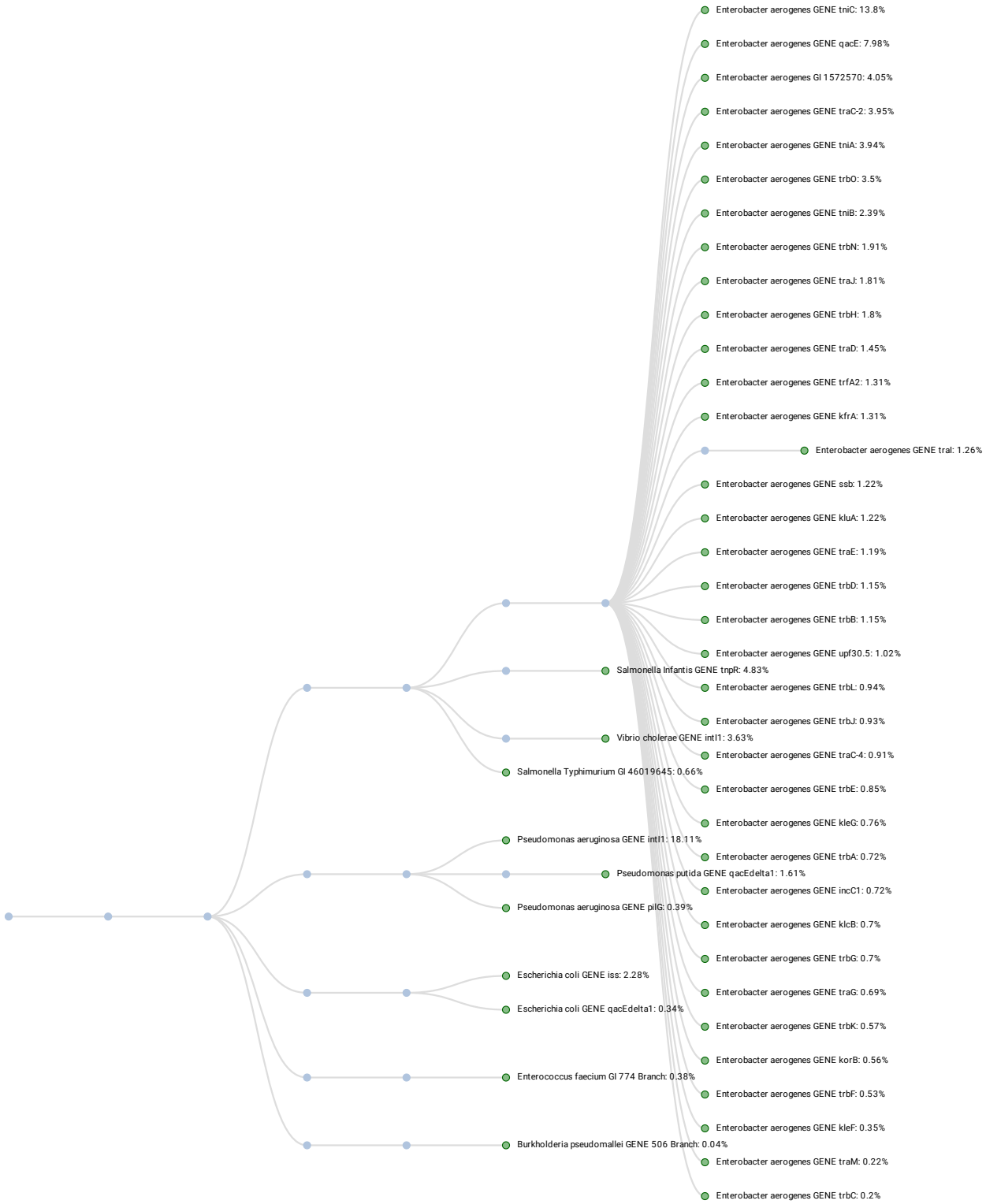
Name	Value
Hit	1600

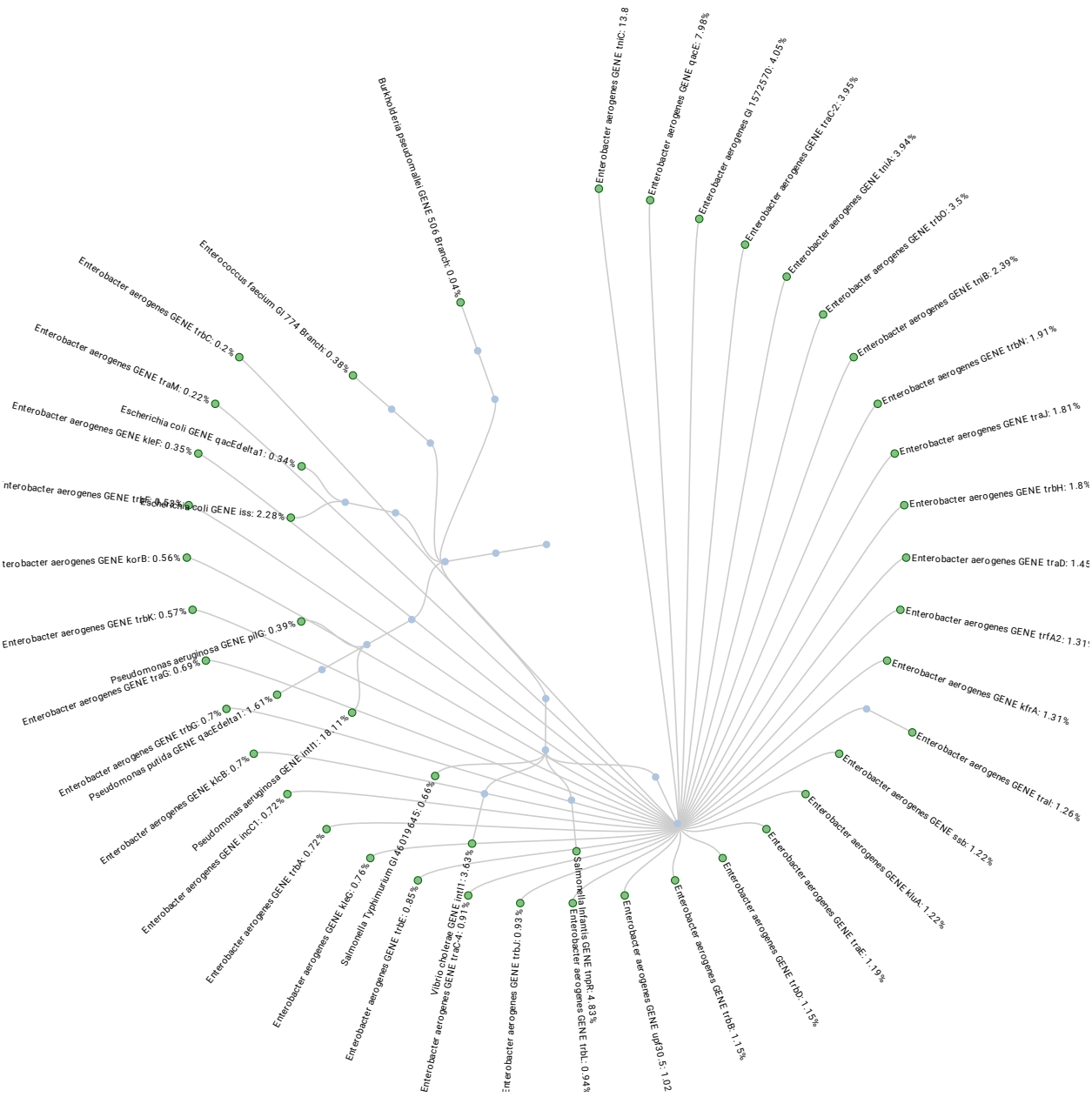
Table

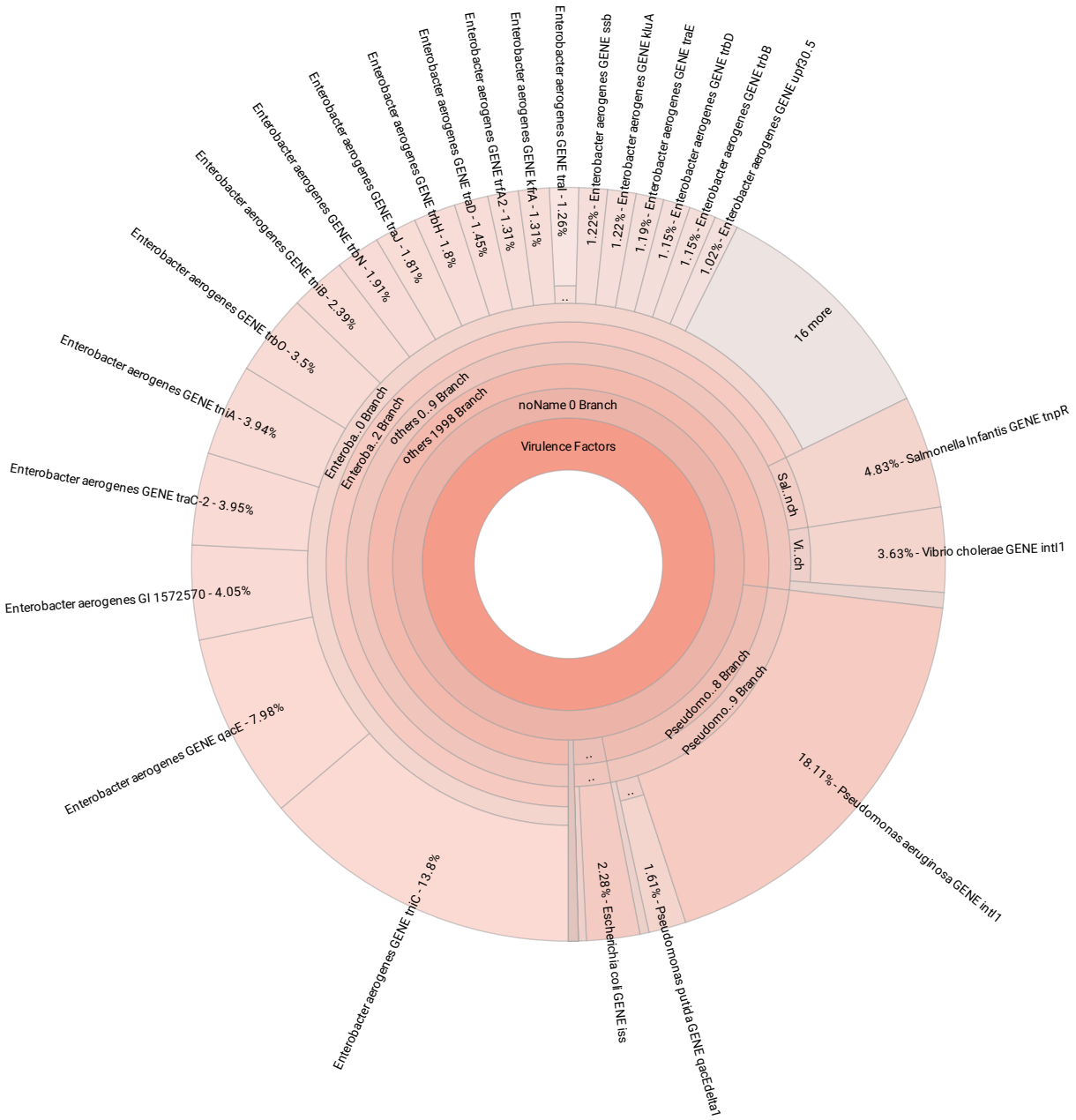
Name	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Pseudomonas aeruginosa GENE intI1	31327.33	18.11%	100.00	100.00	1146
Enterobacter aerogenes GENE tniC	23869.99	13.80%	100.00	100.00	2492
Enterobacter aerogenes GENE qacE	13809.99	7.98%	100.00	100.00	209
Salmonella Infantis GENE tnpR	8351.47	4.83%	75.00	75.00	490
Enterobacter aerogenes GI 1572570	7011.08	4.05%	49.32	49.32	1342
Enterobacter aerogenes GENE traC-2	6841.28	3.95%	85.54	85.54	456
Enterobacter aerogenes GENE tniA	6818.82	3.94%	44.77	44.77	1590
Vibrio cholerae GENE intI1	6279.13	3.63%	100.00	100.00	68
Enterobacter aerogenes GENE trbO	6049.97	3.50%	78.75	78.75	249
Enterobacter aerogenes GENE tniB	4136.2	2.39%	47.76	47.76	403
Escherichia coli GENE iss	3946.35	2.28%	23.81	23.81	1132
Enterobacter aerogenes GENE trbN	3304.52	1.91%	52.00	52.00	199
Enterobacter aerogenes GENE traJ	3124.15	1.81%	48.54	48.54	158
Enterobacter aerogenes GENE trbH	3122.15	1.80%	53.39	53.39	148
Pseudomonas putida GENE qacEdelta1	2788.09	1.61%	100.00	100.00	6
Enterobacter aerogenes GENE traD	2501.93	1.45%	41.98	41.98	110
Enterobacter aerogenes GENE trfA2	2272.8	1.31%	38.15	38.15	158
Enterobacter aerogenes GENE kfrA	2268.62	1.31%	40.77	40.77	159

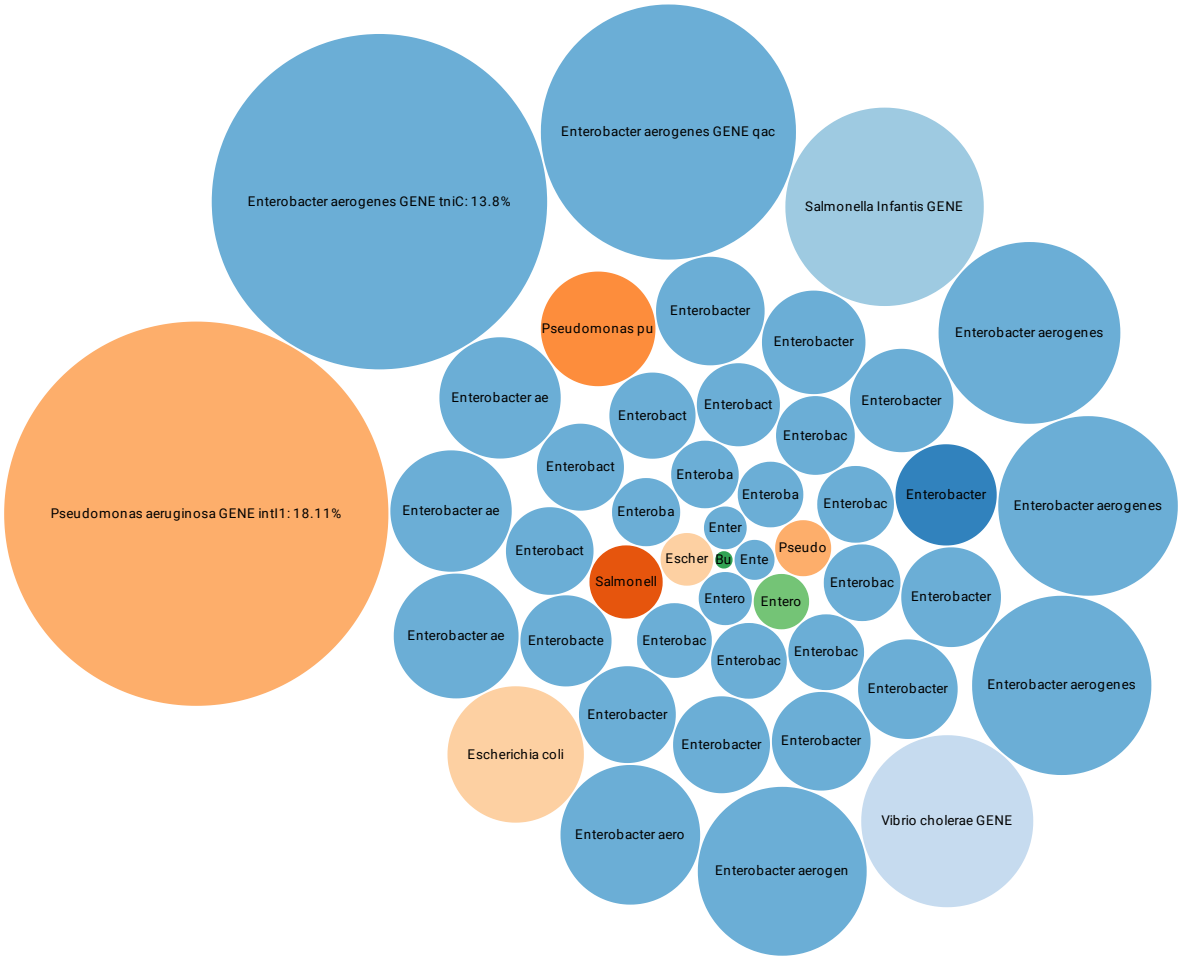
Name	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Enterobacter aerogenes GENE traI	2174.99	1.26%	33.86	32.25	329
Enterobacter aerogenes GENE ssb	2109.78	1.22%	42.86	42.86	82
Enterobacter aerogenes GENE kluA	2104.26	1.22%	51.25	51.25	48
Enterobacter aerogenes GENE traE	2064.56	1.19%	30.49	30.49	366
Enterobacter aerogenes GENE trbD	1993.58	1.15%	44.87	44.87	59
Enterobacter aerogenes GENE trbB	1989.41	1.15%	29.15	29.15	244
Enterobacter aerogenes GENE upf30.5	1760.79	1.02%	40.19	40.19	60
Enterobacter aerogenes GENE trbL	1628.04	0.94%	27.59	27.59	187
Enterobacter aerogenes GENE trbJ	1605.15	0.93%	33.18	33.18	94
Enterobacter aerogenes GENE traC-4	1573.67	0.91%	18.06	18.06	365
Enterobacter aerogenes GENE trbE	1464.96	0.85%	23.29	23.29	302
Enterobacter aerogenes GENE kleG	1316.59	0.76%	38.71	38.71	24
Enterobacter aerogenes GENE trbA	1249.83	0.72%	33.33	33.33	34
Enterobacter aerogenes GENE incC1	1247.48	0.72%	19.13	19.13	150
Enterobacter aerogenes GENE klcB	1217.89	0.70%	26.22	26.22	82
Enterobacter aerogenes GENE trbG	1217.15	0.70%	27.88	27.88	63
Enterobacter aerogenes GENE traG	1185.12	0.69%	17.86	17.86	224
Salmonella Typhimurium GI 46019645	1136.42	0.66%	14.78	14.78	217
Enterobacter aerogenes GENE trbK	986.62	0.57%	31.15	31.15	19
Enterobacter aerogenes GENE korB	969.17	0.56%	21.97	21.97	65
Enterobacter aerogenes GENE trbF	914.03	0.53%	23.08	23.08	42

Name	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Pseudomonas aeruginosa GENE pilG	665.4	0.39%	12.10	12.10	61
Enterococcus faecium GI 774 Branch	651.17	0.38%	15.99	15.99	47
Enterobacter aerogenes GENE kleF	598.07	0.35%	20.90	20.90	14
Escherichia coli GENE qacEdelta1	588.74	0.34%	24.32	24.32	14
Enterobacter aerogenes GENE traM	386.86	0.22%	14.29	14.29	12
Enterobacter aerogenes GENE trbC	338.51	0.20%	12.50	12.50	12
Burkholderia pseudomallei GENE 506 Branch	63.39	0.04%	100.00	100.00	6


Enterobacter aerogenes GENE tniC: 13.8%
Enterobacter aerogenes GENE qacE: 7.98%
Enterobacter aerogenes GI 1572570: 4.05%
Enterobacter aerogenes GENE traC-2: 3.95%
Enterobacter aerogenes GENE tniA: 3.94%
Enterobacter aerogenes GENE trbO: 3.5%
Enterobacter aerogenes GENE tniB: 2.39%
Enterobacter aerogenes GENE trbN: 1.91%
Enterobacter aerogenes GENE traJ: 1.81%
Enterobacter aerogenes GENE trbH: 1.8%
Enterobacter aerogenes GENE traD: 1.45%
Enterobacter aerogenes GENE trfA2: 1.31%
Enterobacter aerogenes GENE kfrA: 1.31%
Enterobacter aerogenes GENE tral: 1.26%
Enterobacter aerogenes GENE ssb: 1.22%
Enterobacter aerogenes GENE kluA: 1.22%
Enterobacter aerogenes GENE traE: 1.19%
Enterobacter aerogenes GENE trbD: 1.15%
Enterobacter aerogenes GENE trbB: 1.15%
Enterobacter aerogenes GENE upf30.5: 1.02%
Salmonella Infantis GENE tnpR: 4.83%
Enterobacter aerogenes GENE trbL: 0.94%
Enterobacter aerogenes GENE trbJ: 0.93%
Vibrio cholerae GENE intI1: 3.63%
Enterobacter aerogenes GENE traC-4: 0.91%
Salmonella Typhimurium GI 46019645: 0.66%
Enterobacter aerogenes GENE trbE: 0.85%
Enterobacter aerogenes GENE kleG: 0.76%
Pseudomonas aeruginosa GENE intI1: 18.11%
Enterobacter aerogenes GENE trbA: 0.72%
Pseudomonas putida GENE qacEdelta1: 1.61%
Enterobacter aerogenes GENE incC1: 0.72%
Pseudomonas aeruginosa GENE pilG: 0.39%
Enterobacter aerogenes GENE klcB: 0.7%
Enterobacter aerogenes GENE trbG: 0.7%
Escherichia coli GENE iss: 2.28%
Enterobacter aerogenes GENE traG: 0.69%
Escherichia coli GENE qacEdelta1: 0.34%
Enterobacter aerogenes GENE trbK: 0.57%
Enterobacter aerogenes GENE korB: 0.56%
Enterococcus faecium GI 774 Branch: 0.38%
Enterobacter aerogenes GENE trbF: 0.53%
Enterobacter aerogenes GENE kleF: 0.35%
Burkholderia pseudomallei GENE 506 Branch: 0.04%
Enterobacter aerogenes GENE traM: 0.22%
Enterobacter aerogenes GENE trbC: 0.2%


Enterobacter aerogenes GENE tniC: 13.8
Enterobacter aerogenes GENE dacE: 7.98%
Enterobacter aerogenes GI:15725770: 4.05%
Enterobacter aerogenes GENE traC2: 3.95%
Enterobacter aerogenes GENE tniA: 3.94%
Enterobacter aerogenes GENE trbO: 3.5%
Enterobacter aerogenes GENE tniB: 2.39%
Enterobacter aerogenes GENE trbN: 1.91%
Enterobacter aerogenes GENE traJ: 1.81%
Enterobacter aerogenes GENE trbH: 1.8%
Enterobacter aerogenes GENE traD: 1.45
Enterobacter aerogenes GENE trfA2: 1.31
Enterobacter aerogenes GENE kfrA: 1.31%
Enterobacter aerogenes GENE traI: 1.26%
Enterobacter aerogenes GENE ssb: 1.22%
Enterobacter aerogenes GENE kluA: 1.22%
Enterobacter aerogenes GENE traE: 1.19%
Enterobacter aerogenes GENE trbD: 1.15%
Enterobacter aerogenes GENE trbB: 1.15%
Enterobacter aerogenes GENE upf30.5: 1.02
Salmonella Infantis GENE mphR: 4.83%
Enterobacter aerogenes GENE trbL: 0.94%
Enterobacter aerogenes GENE trbJ: 0.93%
Vibrio cholerae GENE intI1: 3.63%
Enterobacter aerogenes GENE traC4: 0.91%
Salmonella Typhimurium GI:46019645: 0.66%
Enterobacter aerogenes GENE trbE: 0.85%
Enterobacter aerogenes GENE klcG: 0.76%
Enterobacter aerogenes GENE trbA: 0.72%
Pseudomonas aeruginosa GENE intI1: 18.11%
Enterobacter aerogenes GENE incC1: 0.72%
Enterobacter aerogenes GENE klcB: 0.7%
Pseudomonas putida GENE qacEdelta1: 1.61%
Enterobacter aerogenes GENE trbG: 0.7%
Pseudomonas aeruginosa GENE pilG: 0.39%
Enterobacter aerogenes GENE traG: 0.69%
Enterobacter aerogenes GENE trbK: 0.57%
terobacter aerogenes GENE korB: 0.56%
Escherichia coli GENE iss: 2.28%
Enterobacter aerogenes GENE kleF: 0.35%
Escherichia coli GENE qacEdelta1: 0.34%
Enterobacter aerogenes GENE traM: 0.22%
Enterobacter aerogenes GENE trbC: 0.2%
Enterococcus faecium GI:774 Branch: 0.38%
Burkholderia pseudomallei GENE 506 Branch: 0.04%


Virulence Factors
noName 0 Branch
Enteroba..0 Branch
Enteroba..2 Branch
others 0..9 Branch
others 1998 Branch
Pseudomo..8 Branch
Pseudomo..9 Branch
Sal..nch
Vi..ch
16 more
4.83% - Salmonella Infantis GENE tnpR
3.63% - Vibrio cholerae GENE intI1
18.11% - Pseudomonas aeruginosa GENE intI1
1.61% - Pseudomonas putida GENE qacEdelta1
2.28% - Escherichia coli GENE iss
Enterobacter aerogenes GENE tniC - 13.8%
Enterobacter aerogenes GENE qacE - 7.98%
Enterobacter aerogenes GI 1572570 - 4.05%
Enterobacter aerogenes GENE traC-2 - 3.95%
Enterobacter aerogenes GENE tniA - 3.94%
Enterobacter aerogenes GENE trbO - 3.5%
Enterobacter aerogenes GENE tniB - 2.39%
Enterobacter aerogenes GENE trbN - 1.91%
Enterobacter aerogenes GENE traJ - 1.81%
Enterobacter aerogenes GENE trbH - 1.8%
Enterobacter aerogenes GENE traD - 1.45%
Enterobacter aerogenes GENE trfA2 - 1.31%
Enterobacter aerogenes GENE klfA - 1.31%
Enterobacter aerogenes GENE traI - 1.26%
1.22% - Enterobacter aerogenes GENE ssb
1.22% - Enterobacter aerogenes GENE kluA
1.19% - Enterobacter aerogenes GENE traE
1.15% - Enterobacter aerogenes GENE trbD
1.15% - Enterobacter aerogenes GENE trbB
1.02% - Enterobacter aerogenes GENE upf30.5

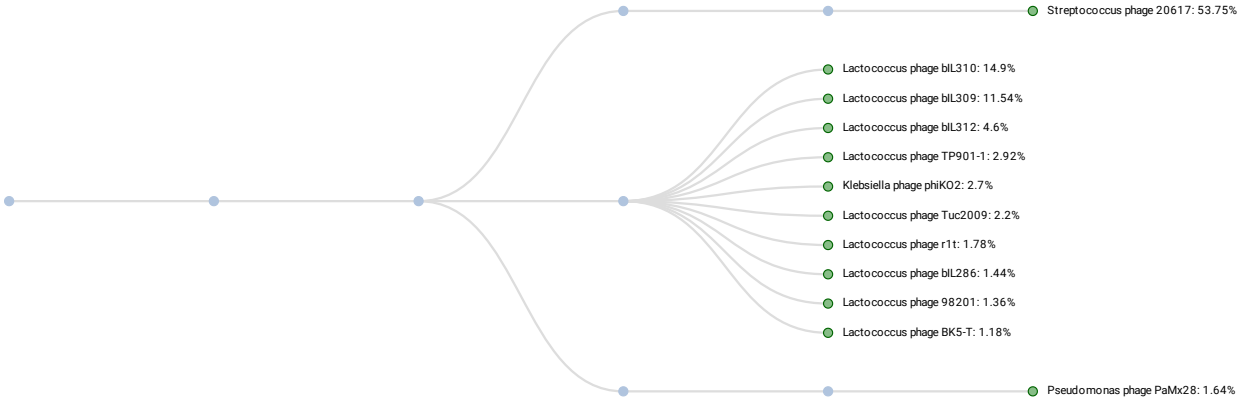

Enterobacter aerogenes GENE tniC: 13.8%
Enterobacter aerogenes GENE qac
Salmonella Infantis GENE
Pseudomonas pu
Enterobacter
Enterobacter
Enterobacter aerogenes
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Pseudomonas aeruginosa GENE intI1: 18.11%
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Enterobacter
Enterobacter aerogenes
Enterobacter ae
Enterobact
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Escher
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Pseudo
Salmonell
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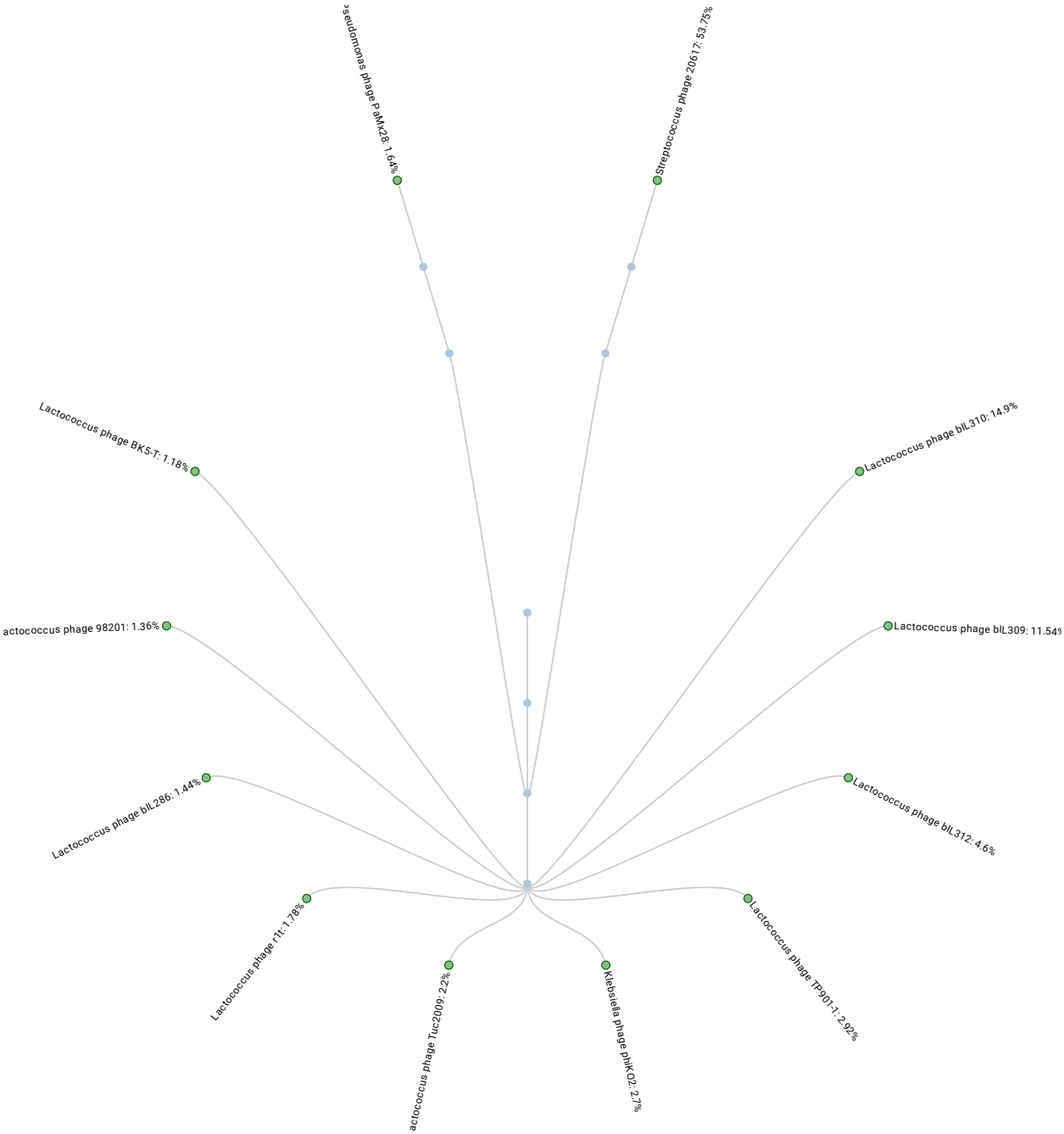
Fasta/q details

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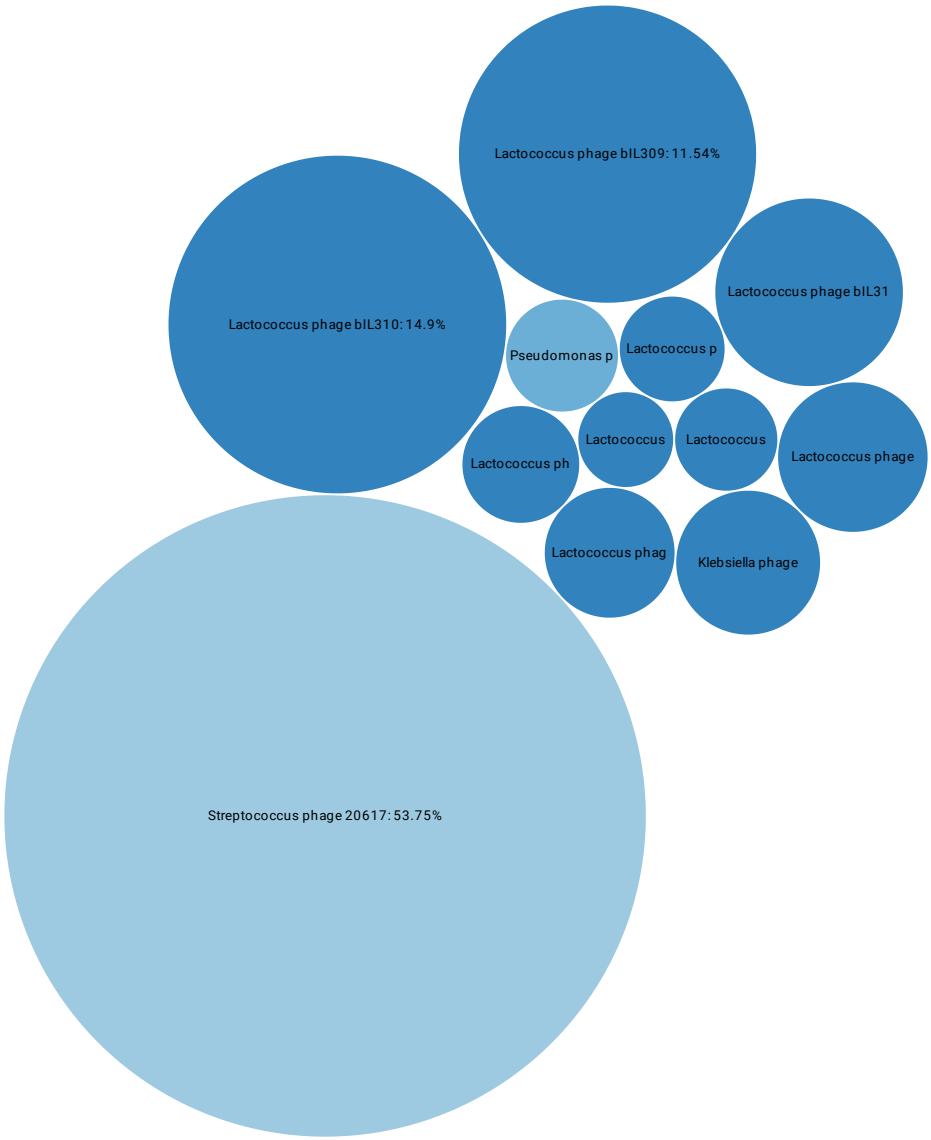
Table

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Streptococcus phage 20617	1392231	130.4	53.75%	2.03	1.58	941
Lactococcus phage bIL310	151538	36.14	14.90%	0.54	0.53	156
Lactococcus phage bIL309	151537	27.99	11.54%	0.52	0.51	134
Lactococcus phage bIL312	151539	11.15	4.60%	0.32	0.31	52
Lactococcus phage TP901-1	35345	7.08	2.92%	0.21	0.25	68
Klebsiella phage phiKO2	255431	6.56	2.70%	0.17	0.17	37
Lactococcus phage Tuc2009	35241	5.34	2.20%	0.13	0.23	32
Lactococcus phage r1t	43685	4.32	1.78%	0.17	0.12	14
Pseudomonas phage PaMx28	1175659	3.97	1.64%	0.11	0.12	27
Lactococcus phage bIL286	151536	3.48	1.44%	0.12	0.11	27
Lactococcus phage 98201	1871690	3.31	1.36%	0.13	0.39	14
Lactococcus phage BK5-T	31754	2.85	1.18%	0.10	0.27	14


Streptococcus phage 20617: 53.75%
Lactococcus phage bIL310: 14.9%
Lactococcus phage bIL309: 11.54%
Lactococcus phage bIL312: 4.6%
Lactococcus phage TP901-1: 2.92%
Klebsiella phage phiKO2: 2.7%
Lactococcus phage Tuc2009: 2.2%
Lactococcus phage r1t: 1.78%
Lactococcus phage bIL286: 1.44%
Lactococcus phage 98201: 1.36%
Lactococcus phage BK5-T: 1.18%
Pseudomonas phage PaMx28: 1.64%


Pseudomonas phage PaMx28: 1.64%
Streptococcus phage 20617: 53.75%
Lactococcus phage BK5-T: 1.18%
Lactococcus phage bIL310: 14.9%
actococcus phage 98201: 1.36%
Lactococcus phage bIL309: 11.54%
Lactococcus phage bIL286: 1.44%
Lactococcus phage bIL312: 4.6%
Lactococcus phage r1t: 1.78%
Lactococcus phage TP901-1: 2.92%
actococcus phage Tuc2009: 2.2%
Klebsiella phage phiKO2: 2.7%


Caudovirales
Siphoviridae
unclassifi..phoviridae
Brussowvirus
unclassifi..ussowvirus
14.9% - Lactococcus phage bIL310
11.54% - Lactococcus phage bIL309
4.6% - Lactococcus phage bIL312
2.92% - Lactococcus phage TP901-1
2.7% - Klebsiella phage phiKO2
2.2% - Lactococcus phage Tuc2009
1.78% - Lactococcus phage r1t
1.44% - Lactococcus phage bIL286
1.36% - Lactococcus phage 98201
1.18% - Lactococcus phage BK5-T
1.64% - Pseudomonas phage PaMx28
..
..
Streptococcus phage 20617 - 53.75%


Lactococcus phage bIL309: 11.54%
Lactococcus phage bIL310: 14.9%
Lactococcus phage bIL31
Pseudomonas p
Lactococcus p
Lactococcus ph
Lactococcus
Lactococcus
Lactococcus phage
Lactococcus phag
Klebsiella phage
Streptococcus phage 20617: 53.75%

Fasta/q details

Name	Value
Hit	660605

Table

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Spirochaetaceae bacterium UBA6243	1952898	14642.43	12.19%	72.94	92.76	22569
Spirochaetaceae bacterium UBA6809	1952899	11758.6	9.79%	58.74	90.02	23831
Desulfobulbaceae bacterium UBA5750	1961557	10700.6	8.91%	56.67	83.32	13573
Geobacter sp. UBA4050	1961391	8172.74	6.80%	49.90	69.39	2616
Desulfobulbaceae bacterium UBA5604	1961554	7401.52	6.16%	37.69	82.96	6101
candidate division WOR-3 bacterium UBA5618	1948313	7376.48	6.14%	31.76	55.56	622
Desulfobulbaceae bacterium UBA2248	1961544	7186.24	5.98%	36.73	81.71	8744
candidate division WOR-3 bacterium	2052148	7131.51	5.94%	27.26	54.21	776
candidate division WOR-3 bacterium UBA2202	1948307	6880.25	5.73%	30.38	50.87	836
candidate division WOR-3 bacterium UBA4773	1948312	6642.8	5.53%	15.64	49.07	921
Desulfobulbaceae bacterium UBA4056	1961550	6439.53	5.36%	32.95	81.44	8304
Acidovorax delafieldii	47920	3648.04	3.04%	21.87	22.47	50547
Acidovorax sp.	1872122	2973.75	2.48%	20.77	20.92	71215
Comamonadaceae bacterium UBA6202	1951611	2640.29	2.20%	19.32	19.56	45854
Spirochaetaceae bacterium	1898206	2516.33	2.10%	21.01	21.01	21624
Paludibacter sp. UBA5753	1947025	1946.12	1.62%	15.36	29.06	2092
Anaerolineaceae bacterium UBA5211	1951422	1750.1	1.46%	15.39	15.39	16187
Desulfovibrio sp. UBA6121	1961409	1135.87	0.95%	9.78	9.78	18180
Syntrophaceae bacterium	2052184	943.44	0.78%	6.93	13.60	1745
Spirochaetaceae bacterium UBA5556	1952892	653.38	0.54%	1.45	4.30	3907

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Pseudomonas sp.	306	542.65	0.45%	3.11	2.99	4590
Rhodoferax sp. UBA6134	1947380	432.94	0.36%	4.30	4.30	4818
Pseudomonas stutzeri	316	396.59	0.33%	3.78	4.39	804
Cutibacterium acnes	1747	359.83	0.30%	2.82	3.97	369
Bacteroidetes bacterium UBA1947	1953142	331.8	0.28%	3.43	3.43	4565
Elusimicrobia bacterium	2030800	319.4	0.27%	1.16	1.35	9617
Patescibacteria group bacterium UBA6241	1948849	292.78	0.24%	3.50	3.50	1270
Caldiserica bacterium UBA6126	1953182	284.79	0.24%	3.44	3.44	1562
Porphyromonadaceae bacterium	2049046	264.47	0.22%	2.75	2.75	2311
Candidatus Pacearchaeota archaeon UBA284	1916005	258.04	0.22%	3.66	3.64	416
Curvibacter sp.	1888168	240.15	0.20%	2.34	2.36	4981
Comamonadaceae bacterium	1871071	239.14	0.20%	1.79	1.86	5680
Peptococcaceae bacterium UBA6116	1952719	152.2	0.13%	2.02	2.02	838
Betaproteobacteria bacterium UBA2592	1948455	126	0.11%	0.91	0.91	2859
Pelotomaculum sp. UBA4789	1947067	109.74	0.09%	1.35	1.35	889
Candidatus Collierbacteria bacterium	2053540	105.72	0.09%	2.24	1.61	10
Gallionellaceae bacterium UBA2239	1953084	89.6	0.08%	0.69	0.69	2776
Syntrophaceae bacterium UBA4059	1961430	78.05	0.07%	0.96	0.96	1192
Anaerolineaceae bacterium UBA4781	1951412	78.46	0.07%	1.05	1.05	607
Pseudomonas kunmingensis	1211807	72.68	0.06%	1.07	0.90	282
uncultured Collinsella sp.	165190	71	0.06%	0.27	0.27	222
Candidatus Omnitrophica bacterium UBA6210	1953267	70.64	0.06%	0.90	0.90	938
Pseudomonas aeruginosa group	136841	69.48	0.06%	0.51	0.51	6
Caulobacter vibrioides	155892	66.75	0.06%	0.75	0.75	2045
Afipia sp.	1871052	59.73	0.05%	0.13	0.29	104
unclassified Sphingopyxis	2614943	60.39	0.05%	1.51	1.51	19
Desulfobulbaceae bacterium UBA2273	1961547	55.1	0.05%	0.71	0.71	846
Delftia acidovorans	80866	55.18	0.05%	0.66	1.53	834

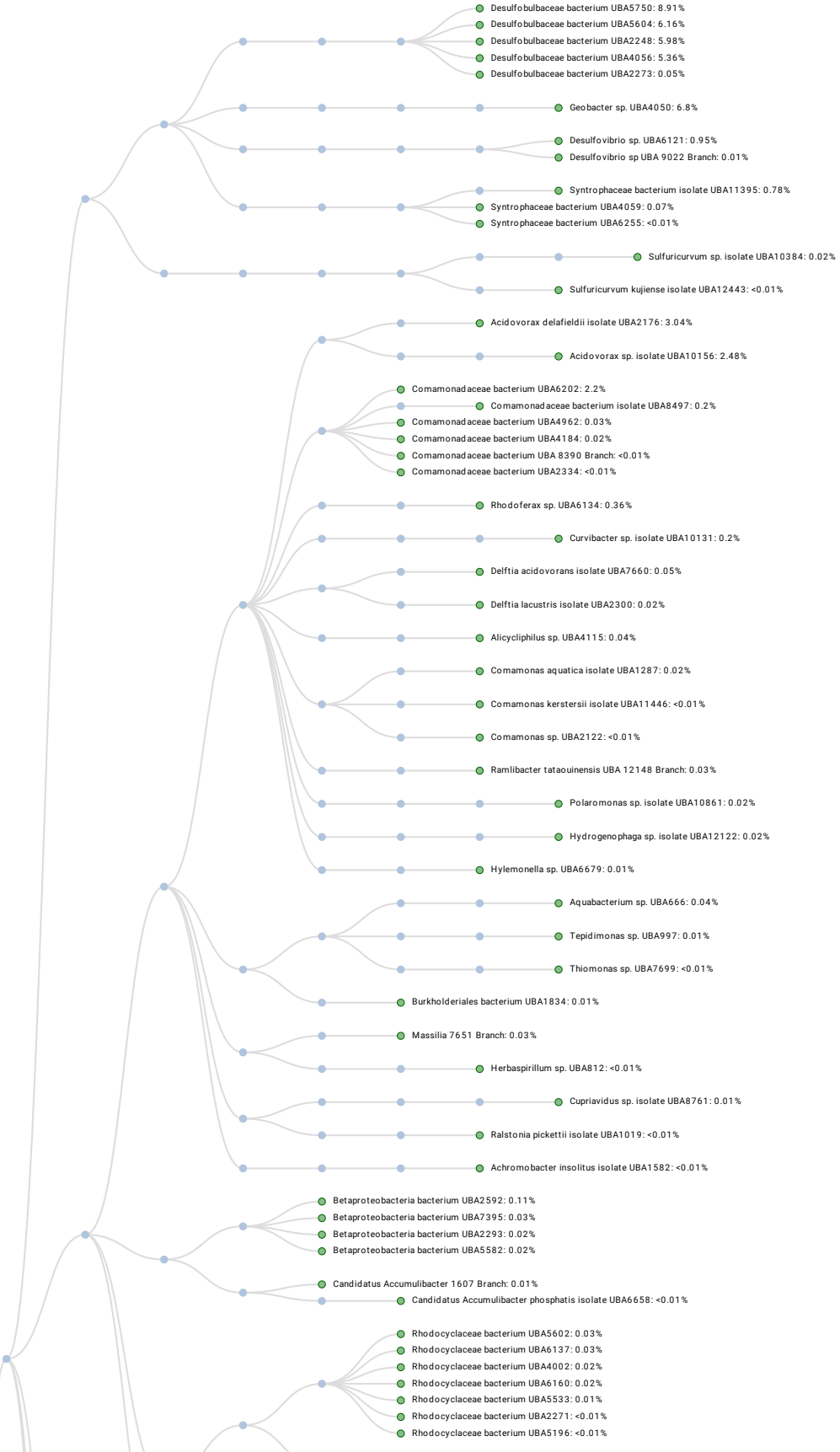
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Alicycliphilus sp. UBA4115	1946002	50.89	0.04%	0.55	0.54	627
Rhodospirillaceae bacterium UBA6219	1952862	46.42	0.04%	0.49	0.49	1700
Candidatus Omnitrophica bacterium UBA2337	1953264	47.11	0.04%	0.70	0.84	354
Candidatus Omnitrophica bacterium	2035772	46.92	0.04%	0.78	0.90	238
Bacteroidetes bacterium	1898104	45.41	0.04%	1.04	1.02	48
Aquabacterium sp. UBA666	1946043	44.84	0.04%	0.55	0.60	713
Bradyrhizobium sp.	376	41.95	0.03%	0.53	0.33	287
Ramlibacter tataouinensis	94132	40.36	0.03%	0.26	0.26	991
Rhodocyclaceae bacterium UBA5602	1952845	39.52	0.03%	1.41	1.10	102
Alcanivorax sp. UBA1614	1945971	39.5	0.03%	1.53	0.85	45
Stenotrophomonas maltophilia	40324	36.79	0.03%	0.48	0.49	938
unclassified Rhodanobacteraceae	1850978	37.6	0.03%	1.22	1.22	9
candidate division WWE3 bacterium	2053526	34.26	0.03%	0.59	0.59	165
Massilia	149698	33.61	0.03%	0.11	0.11	29
Rhodocyclaceae bacterium UBA6137	1952846	34.03	0.03%	1.36	1.07	48
Betaproteobacteria bacterium UBA7395	1948463	33.97	0.03%	0.33	0.38	981
Lentisphaeria bacterium	2053569	33.98	0.03%	0.35	0.36	1458
Proteiniphilum sp. UBA5739	1947287	32.1	0.03%	0.58	0.33	123
Candidatus Nomurabacteria bacterium	2052152	31.9	0.03%	0.16	0.31	50
Ignavibacteria bacterium UBA6104	1948681	30.85	0.03%	0.66	0.90	70
Candidatus Woesebacteria bacterium	2026804	31.78	0.03%	1.10	0.89	26
Candidatus Shapirobacteria bacterium UBA4809	1953385	31.13	0.03%	0.42	0.42	113
Patescibacteria group bacterium	2052139	30.95	0.03%	1.41	0.75	36
Comamonadaceae bacterium UBA4962	1951608	29.73	0.03%	0.28	0.30	1483
Candidatus Microthrix sp. UBA7237	1946202	30.05	0.03%	0.38	0.37	950

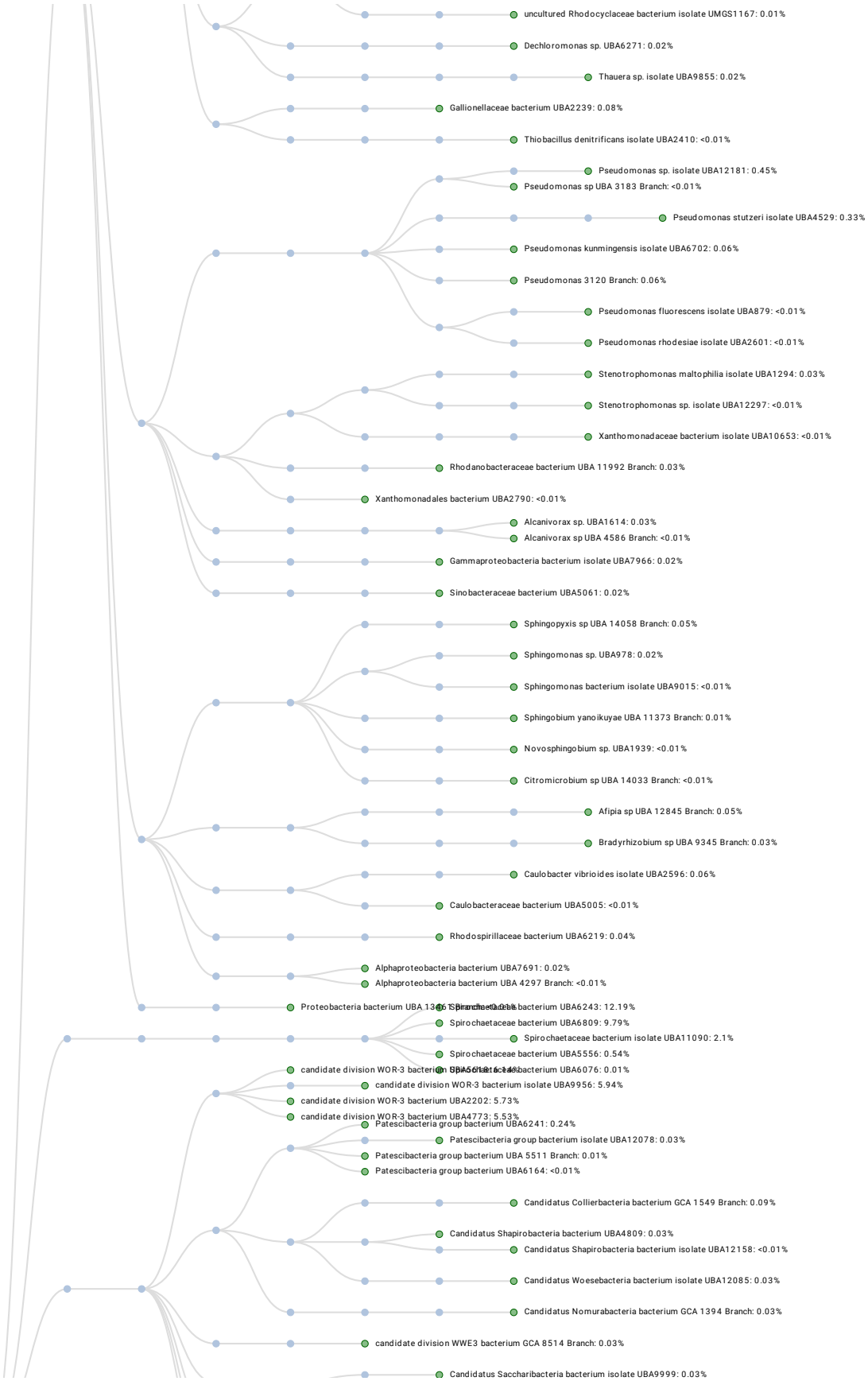
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Candidatus Saccharibacteria bacterium	2026720	29.98	0.03%	0.47	0.47	255
Streptococcus sp.	1306	29.06	0.02%	0.46	0.53	227
Comamonadaceae bacterium UBA4184	1951606	26.09	0.02%	0.22	0.21	1256
Desulfotomaculum sp.	41211	26.14	0.02%	0.62	0.34	621
Betaproteobacteria bacterium UBA2293	1948454	25.13	0.02%	0.26	0.27	1141
Betaproteobacteria bacterium UBA5582	1948460	25.1	0.02%	0.22	0.26	1018
Gammaproteobacteria bacterium	1913989	25.56	0.02%	0.33	0.32	542
Polaromonas sp.	1869339	24.46	0.02%	0.23	0.20	138
unclassified Actinobacteria	1752188	23.46	0.02%	1.46	1.46	4
Ignavibacteria bacterium UBA2268	1948663	23.09	0.02%	0.45	0.78	94
Anaerolineaceae bacterium UBA4081	1951410	22.33	0.02%	0.39	0.41	184
Actinobacteria	201174	23.16	0.02%	1.33	1.33	4
Mageeibacillus sp. UBA5770	1946799	23.23	0.02%	0.41	0.41	743
Comamonas aquatica	225991	21.73	0.02%	0.22	0.24	766
Hydrogenophaga sp.	1904254	21.21	0.02%	0.41	0.45	80
Rhodocyclaceae bacterium UBA4002	1952841	21.73	0.02%	0.39	0.99	46
Dechloromonas sp. UBA6271	1946404	21.56	0.02%	0.22	0.24	871
Sinobacteraceae bacterium UBA5061	1953077	21.37	0.02%	0.23	0.23	718
Elusimicrobia bacterium UBA1570	1947910	21.53	0.02%	0.12	0.12	755
Anaerolineaceae bacterium	2024896	21.08	0.02%	0.32	0.32	289
Candidatus Microthrix parvicella	41950	21.5	0.02%	0.61	0.91	27
Holophagaceae bacterium	2052165	21.42	0.02%	0.30	0.30	416
Delftia lacustris	558537	20.37	0.02%	0.25	1.03	643
Alphaproteobacteria bacterium UBA7691	1948445	20.35	0.02%	0.28	0.28	514
Sulfuricurvum sp.	2025608	18.79	0.02%	0.25	0.30	383
Rhodocyclaceae bacterium UBA6160	1952847	18.87	0.02%	0.31	0.33	231
Sphingomonas sp. UBA978	1947536	18.9	0.02%	0.20	0.20	954
Desulfosporosinus sp.	157907	19.12	0.02%	0.27	0.27	508

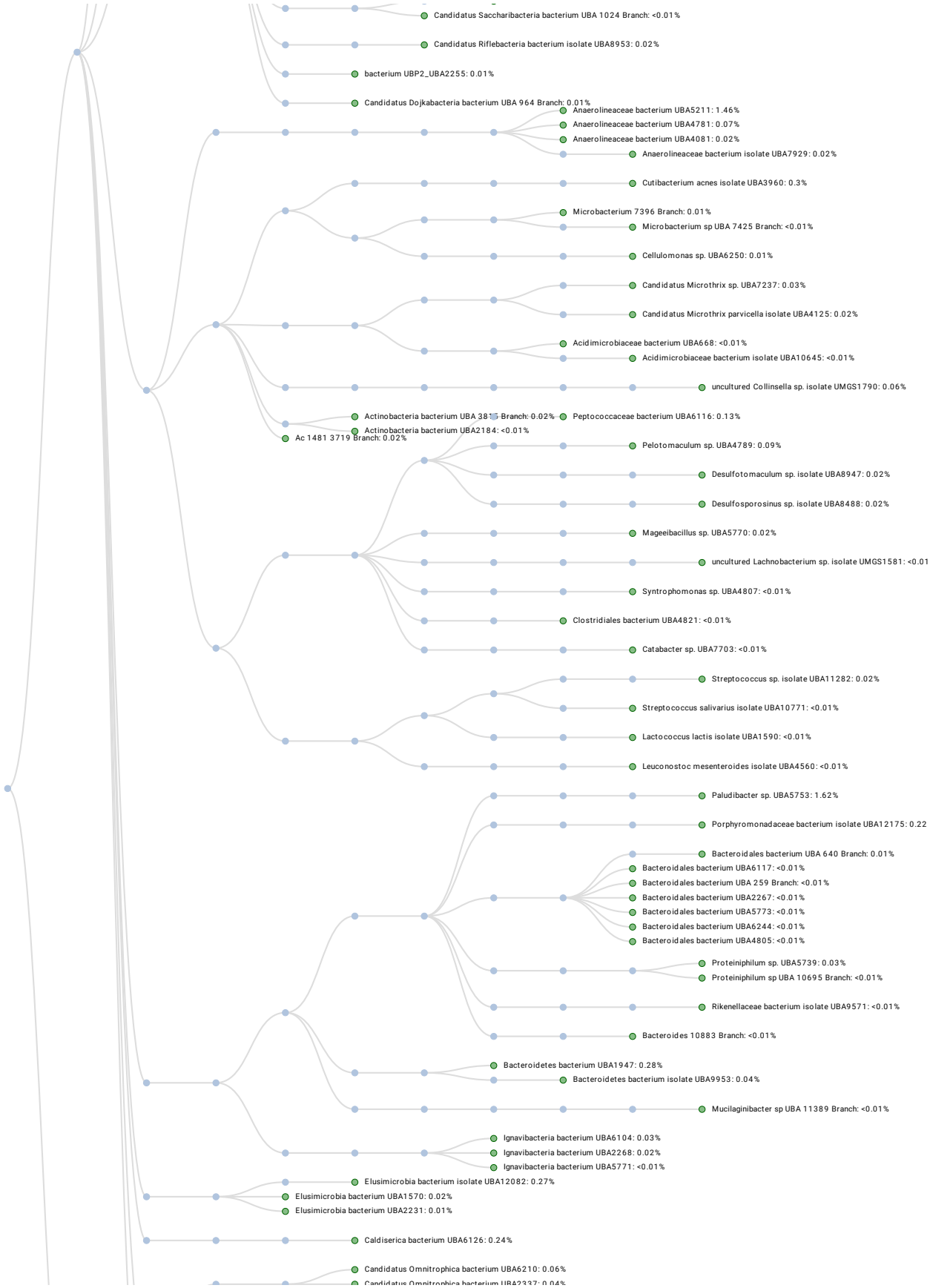
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Verrucomicrobiaceae bacterium UBA7681	1952943	19.75	0.02%	0.26	0.28	712
Thauera sp.	1905334	17.49	0.02%	0.15	0.17	759
Candidatus Riflebacteria bacterium	2053586	17.64	0.02%	0.25	0.25	442
Elusimicrobia bacterium UBA2231	1947911	16.71	0.01%	0.13	0.17	304
bacterium UBP2_UBA2255	1953423	16.67	0.01%	0.33	0.18	822
Methanomassiliicoccaceae archaeon UBA248	1915631	16.62	0.01%	0.27	0.27	239
Candidatus Accumulibacter	327159	15.36	0.01%	0.28	0.28	12
Sphingobium yanoikuyae	13690	15.64	0.01%	0.13	0.13	54
Microbacterium	33882	15.49	0.01%	0.16	0.16	293
Spirochaetaceae bacterium UBA6076	1952896	14.59	0.01%	0.18	0.18	336
Hylemonella sp. UBA6679	1946611	14.71	0.01%	0.16	0.16	505
Tepidimonas sp. UBA997	1947650	14.16	0.01%	0.16	0.16	442
Burkholderiales bacterium UBA1834	1950768	14.56	0.01%	0.22	0.17	188
uncultured Rhodocyclaceae bacterium	151985	14.18	0.01%	0.16	0.17	543
Bacteroidales bacterium	2030927	14.13	0.01%	0.23	0.32	39
unclassified Desulfovibrio	2593640	13.56	0.01%	0.27	0.21	86
Cupriavidus sp.	1873897	12.7	0.01%	0.25	0.25	62
Rhodocyclaceae bacterium UBA5533	1952844	13.66	0.01%	0.18	0.18	496
Cellulomonas sp. UBA6250	1946310	13.28	0.01%	0.19	0.19	455
unclassified Patescibacteria group	1948766	13.1	0.01%	0.12	0.12	49
Candidatus Dojkabacteria	74243	12.06	0.01%	0.25	0.25	34
unclassified Comamonadaceae	83494	10.98	<0.01%	0.17	0.17	146
Comamonadaceae bacterium UBA2334	1951601	11.35	<0.01%	0.13	0.13	564
Comamonas kerstersii	225992	11.1	<0.01%	0.14	0.14	366
Thiomonas sp. UBA7699	1947694	11.35	<0.01%	0.11	0.11	539
unclassified Proteobacteria (miscellaneous)	81684	10.93	<0.01%	0.11	0.11	14
Acidimicrobiaceae bacterium UBA668	1951340	10.38	<0.01%	0.19	0.27	139
uncultured Lachnobacterium sp.	1339173	10.6	<0.01%	0.11	0.10	133

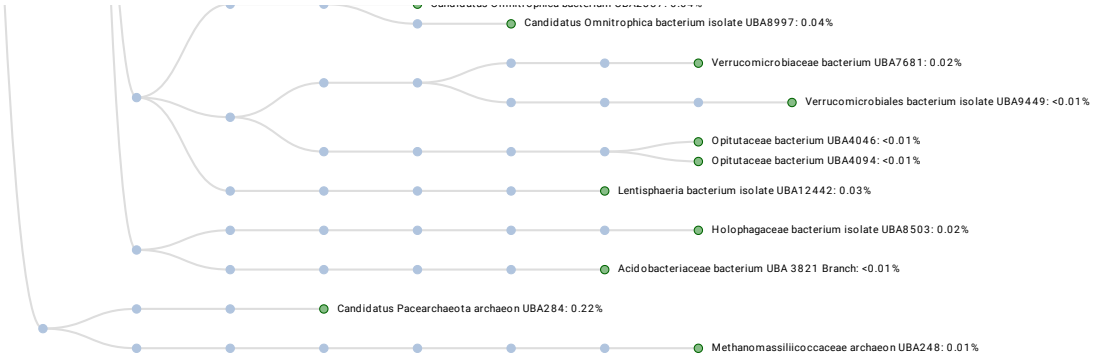
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Candidatus Shapirobacteria bacterium	2053613	11.06	<0.01%	0.19	0.19	70
Comamonas sp. UBA2122	1946390	10.11	<0.01%	0.11	0.12	285
Rhodocyclaceae bacterium UBA2271	1952838	10.01	<0.01%	0.29	0.27	423
Thiobacillus denitrificans	36861	9.29	<0.01%	0.13	0.14	335
unclassified Pseudomonas	2583993	9.13	<0.01%	0.29	0.29	12
Sphingomonas bacterium	1895847	9.96	<0.01%	0.12	0.12	396
unclassified Proteiniphilum	2622718	10.15	<0.01%	0.12	0.12	17
Acidimicrobiaceae bacterium	2024894	9.85	<0.01%	0.19	0.28	100
Syntrophomonas sp. UBA4807	1947618	9.13	<0.01%	0.17	0.17	109
Clostridiales bacterium UBA4821	1950892	9.09	<0.01%	0.18	0.18	90
Sulfuricurvum kujiense	148813	7.95	<0.01%	0.15	0.20	133
Herbaspirillum sp. UBA812	1946590	8.84	<0.01%	0.10	0.10	501
Rhodocyclaceae bacterium UBA5196	1952843	7.96	<0.01%	0.32	0.27	37
Candidatus Accumulibacter phosphatis	327160	7.94	<0.01%	0.10	0.10	407
Pseudomonas fluorescens	294	8.21	<0.01%	0.17	0.38	95
unclassified Alcanivorax	2638842	8.88	<0.01%	0.12	0.12	6
Novosphingobium sp. UBA1939	1946982	8.3	<0.01%	0.12	0.12	363
unclassified Citromicrobium	2630544	8.96	<0.01%	0.32	0.32	7
Caulobacteraceae bacterium UBA5005	1951539	8.37	<0.01%	0.13	0.13	280
Bacteroidales bacterium UBA6117	1950668	8.58	<0.01%	0.31	0.57	14
unclassified Bacteroidales (miscellaneous)	185291	8.33	<0.01%	0.23	0.21	6
Lactococcus lactis	1358	8.11	<0.01%	0.23	0.43	27
Opitutaceae bacterium UBA4046	1952998	8.47	<0.01%	0.16	0.11	93
Verrucomicrobiales bacterium	2026801	8.2	<0.01%	0.13	0.13	244
Ralstonia pickettii	329	6.82	<0.01%	0.10	0.12	304
Stenotrophomonas sp.	69392	7.44	<0.01%	0.20	0.47	28
Pseudomonas rhodesiae	76760	7.69	<0.01%	0.14	0.36	128
Bacteroidales bacterium UBA2267	1950442	6.68	<0.01%	0.26	0.51	11
unclassified Mucilaginibacter	2617802	6.73	<0.01%	22.22	22.22	2

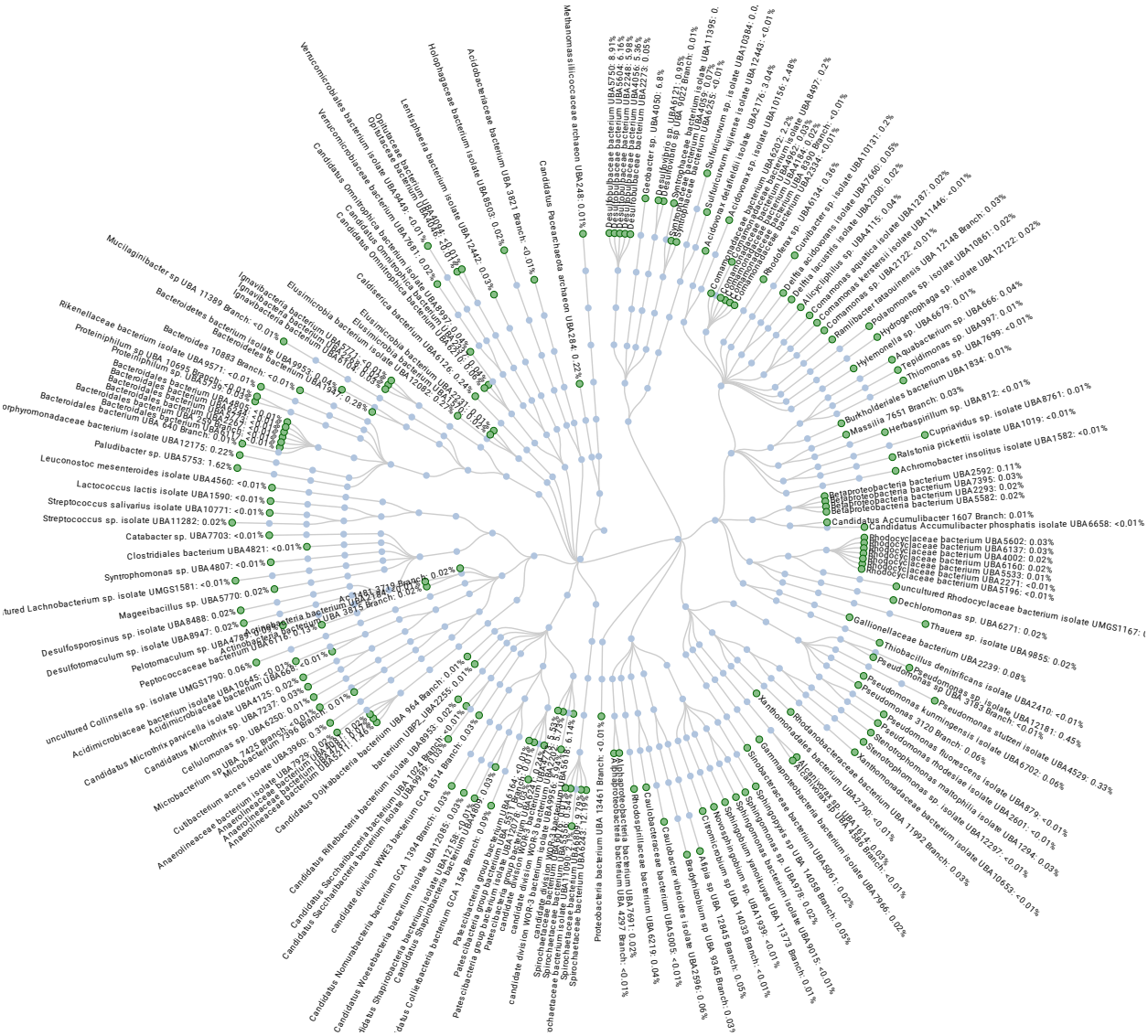
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Catabacter sp. UBA7703	1946300	6.78	<0.01%	0.11	0.11	202
Syntrophaceae bacterium UBA6255	1961454	5.65	<0.01%	0.10	0.10	128
Achromobacter insolitus	217204	5.89	<0.01%	0.10	0.16	119
Xanthomonadaceae bacterium	1926873	6.31	<0.01%	0.11	0.11	144
Xanthomonadales bacterium UBA2790	1951297	6.01	<0.01%	0.12	0.12	488
Rikenellaceae bacterium	2049048	5.65	<0.01%	0.12	0.12	65
Opitutaceae bacterium UBA4094	1952999	6.33	<0.01%	0.13	0.11	74
Bacteroidales bacterium UBA5773	1950653	4.33	<0.01%	0.17	0.47	21
Bacteroidales bacterium UBA6244	1950672	4.91	<0.01%	0.11	0.11	151
unclassified Microbacterium	2609290	4.34	<0.01%	0.12	0.12	26
Actinobacteria bacterium UBA2184	1953117	5.28	<0.01%	0.11	0.11	181
Streptococcus salivarius	1304	5.17	<0.01%	0.11	0.21	65
Leuconostoc mesenteroides	1245	4.73	<0.01%	0.15	0.14	19
Bacteroidales bacterium UBA4805	1950592	3.24	<0.01%	0.12	0.45	12
Ignavibacteria bacterium UBA5771	1948679	3.8	<0.01%	0.41	0.98	3
unclassified Saccharibacteria	1895827	3.82	<0.01%	0.29	0.29	4
unclassified Alphaproteobacteria (miscellaneous)	33807	2	<0.01%	2.00	2.00	4
Bacteroides	816	2.56	<0.01%	0.10	0.10	9
unclassified Acidobacteriaceae	112074	1.99	<0.01%	4.65	4.65	3
Patescibacteria group bacterium UBA6164	1948845	1.07	<0.01%	0.12	0.12	6

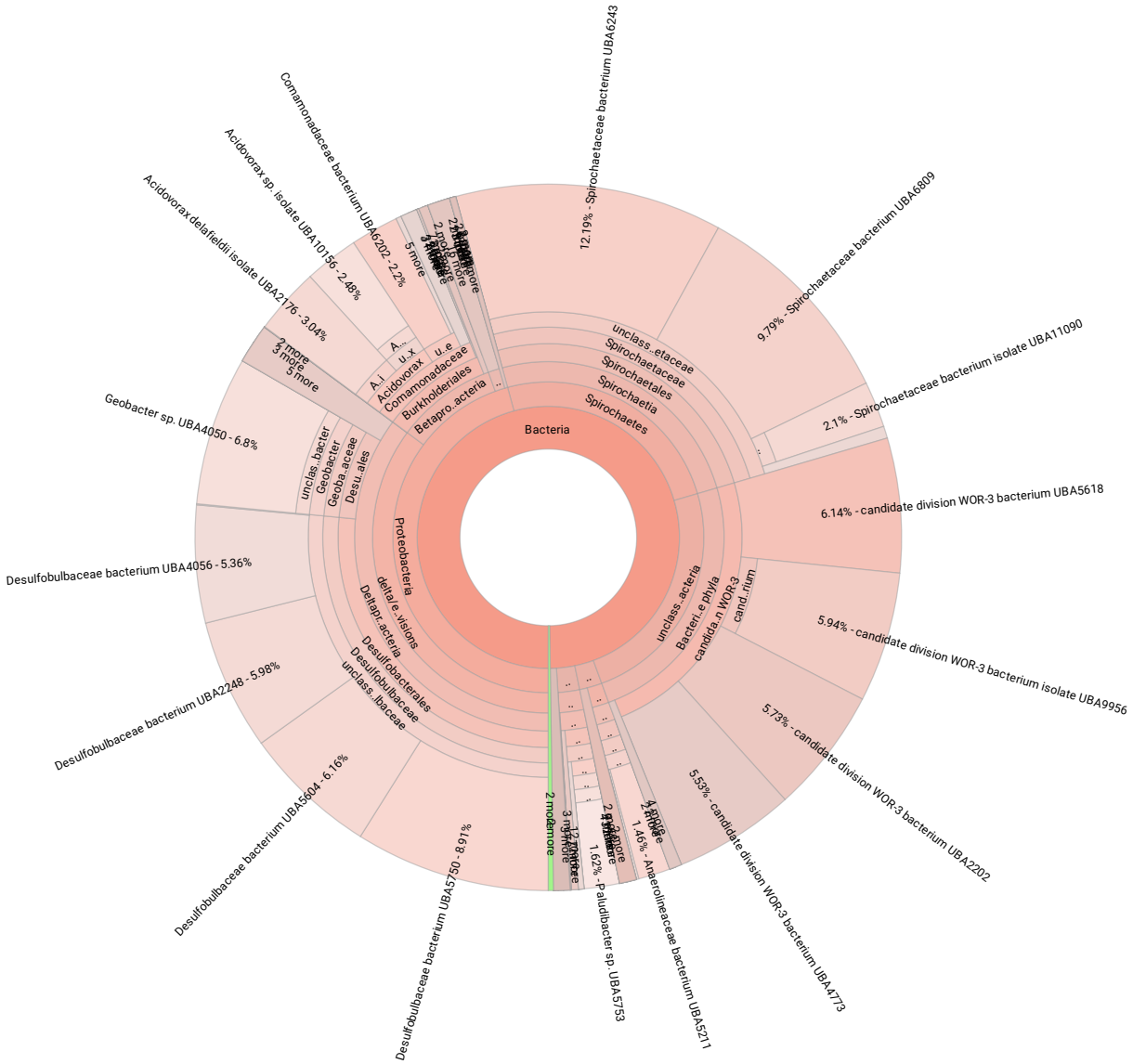

Desulfobulbaceae bacterium UBA5750: 8.91%
Desulfobulbaceae bacterium UBA5604: 6.16%
Desulfobulbaceae bacterium UBA2248: 5.98%
Desulfobulbaceae bacterium UBA4056: 5.36%
Desulfobulbaceae bacterium UBA2273: 0.05%
Geobacter sp. UBA4050: 6.8%
Desulfovibrio sp. UBA6121: 0.95%
Desulfovibrio sp UBA 9022 Branch: 0.01%
Syntrophaceae bacterium isolate UBA11395: 0.78%
Syntrophaceae bacterium UBA4059: 0.07%
Syntrophaceae bacterium UBA6255: <0.01%
Sulfuricurvum sp. isolate UBA10384: 0.02%
Sulfuricurvum kujiense isolate UBA12443: <0.01%
Acidovorax delafieldii isolate UBA2176: 3.04%
Acidovorax sp. isolate UBA10156: 2.48%
Comamonadaceae bacterium UBA6202: 2.2%
Comamonadaceae bacterium isolate UBA8497: 0.2%
Comamonadaceae bacterium UBA4962: 0.03%
Comamonadaceae bacterium UBA4184: 0.02%
Comamonadaceae bacterium UBA 8390 Branch: <0.01%
Comamonadaceae bacterium UBA2334: <0.01%
Rhodoferax sp. UBA6134: 0.36%
Curvibacter sp. isolate UBA10131: 0.2%
Delftia acidovorans isolate UBA7660: 0.05%
Delftia lacustris isolate UBA2300: 0.02%
Alicycliphilus sp. UBA4115: 0.04%
Comamonas aquatica isolate UBA1287: 0.02%
Comamonas kerstersii isolate UBA11446: <0.01%
Comamonas sp. UBA2122: <0.01%
Ramlibacter tataouinensis UBA 12148 Branch: 0.03%
Polaromonas sp. isolate UBA10861: 0.02%
Hydrogenophaga sp. isolate UBA12122: 0.02%
Hylemonella sp. UBA6679: 0.01%
Aquabacterium sp. UBA666: 0.04%
Tepidimonas sp. UBA997: 0.01%
Thiomonas sp. UBA7699: <0.01%
Burkholderiales bacterium UBA1834: 0.01%
Massilia 7651 Branch: 0.03%
Herbaspirillum sp. UBA812: <0.01%
Cupriavidus sp. isolate UBA8761: 0.01%
Ralstonia pickettii isolate UBA1019: <0.01%
Achromobacter insolitus isolate UBA1582: <0.01%
Betaproteobacteria bacterium UBA2592: 0.11%
Betaproteobacteria bacterium UBA7395: 0.03%
Betaproteobacteria bacterium UBA2293: 0.02%
Betaproteobacteria bacterium UBA5582: 0.02%
Candidatus Accumulibacter 1607 Branch: 0.01%
Candidatus Accumulibacter phosphatis isolate UBA6658: <0.01%
Rhodocyclaceae bacterium UBA5602: 0.03%
Rhodocyclaceae bacterium UBA6137: 0.03%
Rhodocyclaceae bacterium UBA4002: 0.02%
Rhodocyclaceae bacterium UBA6160: 0.02%
Rhodocyclaceae bacterium UBA5533: 0.01%
Rhodocyclaceae bacterium UBA2271: <0.01%
Rhodocyclaceae bacterium UBA5196: <0.01%


uncultured Rhodocyclaceae bacterium isolate UMGS1167: 0.01%
Dechloromonas sp. UBA6271: 0.02%
Thauera sp. isolate UBA9855: 0.02%
Gallionellaceae bacterium UBA2239: 0.08%
Thiobacillus denitrificans isolate UBA2410: <0.01%
Pseudomonas sp. isolate UBA12181: 0.45%
Pseudomonas sp UBA 3183 Branch: <0.01%
Pseudomonas stutzeri isolate UBA4529: 0.33%
Pseudomonas kunmingensis isolate UBA6702: 0.06%
Pseudomonas 3120 Branch: 0.06%
Pseudomonas fluorescens isolate UBA879: <0.01%
Pseudomonas rhodesiae isolate UBA2601: <0.01%
Stenotrophomonas maltophilia isolate UBA1294: 0.03%
Stenotrophomonas sp. isolate UBA12297: <0.01%
Xanthomonadaceae bacterium isolate UBA10653: <0.01%
Rhodanobacteraceae bacterium UBA 11992 Branch: 0.03%
Xanthomonadales bacterium UBA2790: <0.01%
Alcanivorax sp. UBA1614: 0.03%
Alcanivorax sp UBA 4586 Branch: <0.01%
Gammaproteobacteria bacterium isolate UBA7966: 0.02%
Sinobacteraceae bacterium UBA5061: 0.02%
Sphingopyxis sp UBA 14058 Branch: 0.05%
Sphingomonas sp. UBA978: 0.02%
Sphingomonas bacterium isolate UBA9015: <0.01%
Sphingobium yanoikuyae UBA 11373 Branch: 0.01%
Novosphingobium sp. UBA1939: <0.01%
Citromicrobium sp UBA 14033 Branch: <0.01%
Afipia sp UBA 12845 Branch: 0.05%
Bradyrhizobium sp UBA 9345 Branch: 0.03%
Caulobacter vibrioides isolate UBA2596: 0.06%
Caulobacteraceae bacterium UBA5005: <0.01%
Rhodospirillaceae bacterium UBA6219: 0.04%
Alphaproteobacteria bacterium UBA7691: 0.02%
Alphaproteobacteria bacterium UBA 4297 Branch: <0.01%
Proteobacteria bacterium UBA 1366 Branch: 0.01%
Spirochaetaceae bacterium UBA6243: 12.19%
Spirochaetaceae bacterium UBA6809: 9.79%
Spirochaetaceae bacterium isolate UBA11090: 2.1%
Spirochaetaceae bacterium UBA5556: 0.54%
candidate division WOR-3 bacterium UBA6076: 0.01%
candidate division WOR-3 bacterium isolate UBA9956: 5.94%
candidate division WOR-3 bacterium UBA2202: 5.73%
candidate division WOR-3 bacterium UBA4773: 5.53%
Patescibacteria group bacterium UBA6241: 0.24%
Patescibacteria group bacterium isolate UBA12078: 0.03%
Patescibacteria group bacterium UBA 5511 Branch: 0.01%
Patescibacteria group bacterium UBA6164: <0.01%
Candidatus Collierbacteria bacterium GCA 1549 Branch: 0.09%
Candidatus Shapirobacteria bacterium UBA4809: 0.03%
Candidatus Shapirobacteria bacterium isolate UBA12158: <0.01%
Candidatus Woesebacteria bacterium isolate UBA12085: 0.03%
Candidatus Nomurabacteria bacterium GCA 1394 Branch: 0.03%
candidate division WWE3 bacterium GCA 8514 Branch: 0.03%
Candidatus Saccharibacteria bacterium isolate UBA9999: 0.03%


Candidatus Saccharibacteria bacterium UBA 1024 Branch: <0.01%
Candidatus Riflebacteria bacterium isolate UBA8953: 0.02%
bacterium UBP2_UBA2255: 0.01%
Candidatus Dojkabacteria bacterium UBA 964 Branch: 0.01%
Anaerolineaceae bacterium UBA5211: 1.46%
Anaerolineaceae bacterium UBA4781: 0.07%
Anaerolineaceae bacterium UBA4081: 0.02%
Anaerolineaceae bacterium isolate UBA7929: 0.02%
Cutibacterium acnes isolate UBA3960: 0.3%
Microbacterium 7396 Branch: 0.01%
Microbacterium sp UBA 7425 Branch: <0.01%
Cellulomonas sp. UBA6250: 0.01%
Candidatus Microthrix sp. UBA7237: 0.03%
Candidatus Microthrix parvicella isolate UBA4125: 0.02%
Acidimicrobiaceae bacterium UBA668: <0.01%
Acidimicrobiaceae bacterium isolate UBA10645: <0.01%
uncultured Collinsella sp. isolate UMGS1790: 0.06%
Actinobacteria bacterium UBA 381 Branch: 0.02%
Peptococcaceae bacterium UBA6116: 0.13%
Actinobacteria bacterium UBA2184: <0.01%
Ac 1481 3719 Branch: 0.02%
Pelotomaculum sp. UBA4789: 0.09%
Desulfotomaculum sp. isolate UBA8947: 0.02%
Desulfosporosinus sp. isolate UBA8488: 0.02%
Mageeibacillus sp. UBA5770: 0.02%
uncultured Lachnobacterium sp. isolate UMGS1581: <0.01
Syntrophomonas sp. UBA4807: <0.01%
Clostridiales bacterium UBA4821: <0.01%
Catabacter sp. UBA7703: <0.01%
Streptococcus sp. isolate UBA11282: 0.02%
Streptococcus salivarius isolate UBA10771: <0.01%
Lactococcus lactis isolate UBA1590: <0.01%
Leuconostoc mesenteroides isolate UBA4560: <0.01%
Paludibacter sp. UBA5753: 1.62%
Porphyromonadaceae bacterium isolate UBA12175: 0.22
Bacteroidales bacterium UBA 640 Branch: 0.01%
Bacteroidales bacterium UBA6117: <0.01%
Bacteroidales bacterium UBA 259 Branch: <0.01%
Bacteroidales bacterium UBA2267: <0.01%
Bacteroidales bacterium UBA5773: <0.01%
Bacteroidales bacterium UBA6244: <0.01%
Bacteroidales bacterium UBA4805: <0.01%
Proteiniphilum sp. UBA5739: 0.03%
Proteiniphilum sp UBA 10695 Branch: <0.01%
Rikenellaceae bacterium isolate UBA9571: <0.01%
Bacteroides 10883 Branch: <0.01%
Bacteroidetes bacterium UBA1947: 0.28%
Bacteroidetes bacterium isolate UBA9953: 0.04%
Mucilaginibacter sp UBA 11389 Branch: <0.01%
Ignavibacteria bacterium UBA6104: 0.03%
Ignavibacteria bacterium UBA2268: 0.02%
Ignavibacteria bacterium UBA5771: <0.01%
Elusimicrobia bacterium isolate UBA12082: 0.27%
Elusimicrobia bacterium UBA1570: 0.02%
Elusimicrobia bacterium UBA2231: 0.01%
Caldiserica bacterium UBA6126: 0.24%
Candidatus Omnitrophica bacterium UBA6210: 0.06%


Candidatus Omnitrophica bacterium isolate UBA8997: 0.04%
Verrucomicrobiaceae bacterium UBA7681: 0.02%
Verrucomicrobiales bacterium isolate UBA9449: <0.01%
Opitutaceae bacterium UBA4046: <0.01%
Opitutaceae bacterium UBA4094: <0.01%
Lentisphaeria bacterium isolate UBA12442: 0.03%
Holophagaceae bacterium isolate UBA8503: 0.02%
Acidobacteriaceae bacterium UBA 3821 Branch: <0.01%
Candidatus Pacearchaeota archaeon UBA284: 0.22%
Methanomassiliicoccaceae archaeon UBA248: 0.01%


Methanomassiliicoccaceae archaeon UBA248: 0.01%
Candidatus Paceibacterota archaeon UBA284: 0.22%
Candidatus Accumulibacter 1607 Branch: 0.01%
Candidatus Accumulibacter phosphatis isolate UBA6658: <0.01%
Betaproteobacteria bacterium UBA7395: 0.03%
Betaproteobacteria bacterium UBA2293: 0.02%
Betaproteobacteria bacterium UBA5582: 0.02%
Rhodocyclaceae bacterium UBA5602: 0.03%
Rhodocyclaceae bacterium UBA6137: 0.03%
Rhodocyclaceae bacterium UBA4002: 0.02%
Rhodocyclaceae bacterium UBA6160: 0.02%
Rhodocyclaceae bacterium UBA5533: 0.01%
Rhodocyclaceae bacterium UBA2271: <0.01%
uncultured Rhodocyclaceae bacterium UBA5196: <0.01%
Dechloromonas sp. UBA6271: 0.02%
Thauera sp. isolate UBA9855: 0.02%
Gallionellaceae bacterium UBA2239: 0.08%
Thiobacillus denitrificans isolate UBA2410: <0.01%
Pseudomonas sp. isolate UBA2181: 0.45%
Pseudomonas sp. UBA3183 Branch: <0.01%
Pseudomonas stutzeri isolate UBA4529: 0.33%
Pseudomonas kunmingensis isolate UBA6702: 0.06%
Pseudomonas 3120 Branch: 0.06%
Pseudomonas fluorescens isolate UBA879: <0.01%
Stenotrophomonas rhizophila isolate UBA2601: <0.01%
Stenotrophomonas maltophilia isolate UBA1294: 0.03%
Xanthomonadaceae bacterium UBA12297: <0.01%
Xanthomonadaceae bacterium UBA11992 Branch: 0.03%
Xanthomonadaceae bacterium UBA10653: <0.01%
Rhodanobacteraceae bacterium UBA2790: <0.01%
Gammaproteobacteria bacterium UBA7946: 0.02%
Sinobacteraceae bacterium UBA5061: 0.02%
Sphingomonas sp UBA 14028 Branch: 0.05%
Sphingomonas sp. UBA9978: 0.02%
Sphingomonas bacterium isolate UBA4015: <0.01%
Sphingopyxis sp UBA 11573 Branch: 0.01%
Sphingobium yanoikuyae UBA 11573: 0.03%
Sphingobium sp. UBA1939: <0.01%
Sphingobium sp UBA 14033 Branch: <0.01%
Monophingobium sp UBA 12845 Branch: 0.05%
Chromobacterium sp UBA 9345 Branch: 0.03%
Aquabacterium sp UBA 11454: 0.03%
Aquabacterium sp UBA 4846 Branch: <0.01%
Rhodospirillaceae bacterium UBA 13461 Branch: <0.01%
Rhodospirillaceae bacterium UBA 1691 Branch: 0.02%
Caulobacteraceae bacterium UBA5005: <0.01%
Caulobacter vibrioides isolate UBA2596: 0.06%
Brachymonas sp. UBA 1434: 0.06%
Rhodoferax sp. UBA6134: 0.36%
Rhodoferax sp. UBA8497: 0.2%
Comamonadaceae bacterium UBA4052: 0.03%
Comamonadaceae bacterium UBA4067: 2.2%
Comamonadaceae bacterium UBA2176: 3.04%
Comamonadaceae bacterium UBA10156: 2.48%
Acidovorax sp. isolate UBA12443: <0.01%
Acidovorax sp. isolate UBA10384: 0.0...
Sulfuricurvum kujiense isolate UBA11395: 0...
Sulfuricurvum sp. isolate UBA2235: <0.01%
Acidovorax delafieldii isolate UBA4459: 0.01%
Syntrophobacteraceae bacterium UBA11395: 0...
Desulfobulbaceae bacterium UBA6121: 0.95%
Desulfobulbus sp. UBA 6121 Branch: 0.01%
Desulfobulbaceae bacterium UBA2272: 5.05%
Desulfobulbaceae bacterium UBA2248: 5.98%
Desulfobulbaceae bacterium UBA2736: 5.36%
Desulfobulbaceae bacterium UBA5750: 8.91%
Desulfobulbaceae bacterium UBA5744: 6.96%
Desulfobulbaceae bacterium UBA5745: 7.96%
Desulfobulbaceae bacterium UBA5746: 7.96%
Desulfobulbaceae bacterium UBA5747: 7.96%
Desulfobulbaceae bacterium UBA5748: 7.96%
Desulfobulbaceae bacterium UBA5749: 7.96%
Desulfobulbaceae bacterium UBA5750: 8.91%
Desulfobulbaceae bacterium UBA5751: 8.91%
Desulfobulbaceae bacterium UBA5752: 8.91%
Desulfobulbaceae bacterium UBA5753: 8.91%
Desulfobulbaceae bacterium UBA5754: 8.91%
Desulfobulbaceae bacterium UBA5755: 8.91%
Desulfobulbaceae bacterium UBA5756: 8.91%
Desulfobulbaceae bacterium UBA5757: 8.91%
Desulfobulbaceae bacterium UBA5758: 8.91%
Desulfobulbaceae bacterium UBA5759: 8.91%
Desulfobulbaceae bacterium


Bacteria
Spirochaetes
Spirochaetia
Spirochaetales
Spirochaetaceae
unclass...etaceae
Betapro..acteria
Burkholderiales
Comamonadaceae
Acidovorax
A...
A...l
u...x
u...e
Proteobacteria
deltae..visions
Deltapr..acteria
Desulfobacterales
Desulfobulbaceae
unclass...lbaceae
unclas...bacter
Geobacter
Geoba..aceae
Desu..ales
unclass..acteria
Bacteri...e phyla
candida...n WOR-3
cand...rium
12.19% - Spirochaetaceae bacterium UBA6243
9.79% - Spirochaetaceae bacterium UBA6809
2.1% - Spirochaetaceae bacterium isolate UBA11090
6.14% - candidate division WOR-3 bacterium UBA5618
5.94% - candidate division WOR-3 bacterium isolate UBA9956
5.73% - candidate division WOR-3 bacterium UBA2202
5.53% - candidate division WOR-3 bacterium UBA4773
1.46% - Anaerolineaceae bacterium UBA5211
1.62% - Paludibacter sp. UBA5753
Desulfobulbaceae bacterium UBA5750 - 8.91%
Desulfobulbaceae bacterium UBA5604 - 6.16%
Desulfobulbaceae bacterium UBA2248 - 5.98%
Desulfobulbaceae bacterium UBA4056 - 5.36%
Geobacter sp. UBA4050 - 6.8%
Acidovorax delafieldii isolate UBA2176 - 3.04%
Acidovorax sp. isolate UBA10156 - 2.48%
Comamonadaceae bacterium UBA6202 - 2.2%
5 more
3 more
2 more


candidate division WOR-3 bac
Desulfobulbaceae bacterium U
Desulfobulbaceae bacterium U
Spirochaetaceae
Paludibacter s
candidate division WOR-3 bac
Comamonadaceae ba
Geobacter sp. UBA4050: 6.8%
Caldi
Porph
Pates
Candi
Anaerolineace
Elusi
Curvi
Acidovorax sp. iso
Bacter
Comam
Desulfovibr
Pept
Cutiba
candidate division WOR-3 ba
Desulfobulbaceae bacterium UBA5750
Acidovorax delafield
Pseudo
Syntrophac
Rhodof
Pseudom
Spirocha
candidate division WOR-3 ba
Desulfobulbaceae bacterium
Spirochaetaceae bacterium UBA6809:
Spirochaetaceae bacterium UBA6243: 12.19

Genomic Sequencing Report

Microbac Oak Ridge WO# Z3FG0106-01 **9/7/2023**

Client: Andrew Klingbell

Sample Project: PERSOM UDEX Release, Former PHL Refineries 2134030309

Sample ID: S-509-20230720

Sample Collected: 7/20/2023

qPCR Overview: Estimated Bacterial Biomass 7.61e8 gc/L

NCBI Taxonomy Browser to look up "Taxonomy Id"
https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi add number in "Search for" in upper left box.

Summary:

- There were 5.915 reads for this sample and the file size was 1.21 GB.
- There were 93 identifications (ID's) in the bacterial data set.
- There were 0 identifications in the virus data set.
- There were 2 identifications in the protists data set.
- There were 11 identifications in the fungal data set.
- There were 29 identifications in the Combined Kingdom data set.
- There were 3 identifications in the Antimicrobial Resistance data set.
- There were 65 identifications in the Virulence Factors data set.
- There were 4 identifications in the phages data set.
- There were 70 identifications in the Dark Matter (Beta) data set.

The Oak Ridge Microbac laboratory uses the CosmosID bioinformatics pipeline and cloud computing platform for analysis and report generation. The report consists of tables and figures for bacteria, antibiotic resistance genes, fungi, protists, phages, viruses, secondary bacterial (Dark Matter) and virulence genes.

Report Definitions

- **Name:** The name for the organism or taxonomic level or the name of the antibiotic resistance gene or virulence factor.
- **Calls at different taxonomic levels:** In the results there may be some calls at sub-species or strain level and others at species or genus level or higher. CosmosID calls the lowest level

possible based on the identification of unique kmers that match the reference genomes. If identification was not possible at strain level, for example, there will be a try to make an identification at species level etc.

- **Tax ID:** The tax id is the NCBI taxonomic id for the organism.
- **Frequency:** The number of unique kmer occurrences in the queried sample. This is roughly equivalent to the number of reads that matched to the organism identified.
- **Unique Matches:** Unique matches percent is the amount of unique kmers that were found in the sample for an organism out of the total possible number of kmers in the database that are unique to that organism.
- **Total Matches:** The shared plus unique matches divided by the pre-calculated shared plus unique matches possible in the reference database.
- **Relative Abundance:** Relative abundance is calculated based on the number of organism specific kmers and their observed frequency in the sample and then normalized to represent the abundance of each organism.

The following are the methods used for sample processing and analysis for this project:

DNA Extraction :

DNA samples were quantified using Qubit 4 fluorometer and Qubit™ dsDNA HS Assay Kit (Thermofisher Scientific).

Library Preparation and Sequencing:

DNA libraries were prepared using the Nextera XT DNA Library Preparation Kit (Illumina) and IDT Unique Dual Indexes with total DNA input of 1ng. Genomic DNA was fragmented using a proportional amount of Illumina Nextera XT fragmentation enzyme. Unique dual indexes were added to each sample followed by 12 cycles of PCR to construct libraries. DNA libraries were purified using AMpure magnetic Beads (Beckman Coulter) and eluted in QIAGEN EB buffer. DNA libraries were quantified using Qubit 4 fluorometer and Qubit™ dsDNA HS Assay Kit. Libraries were then sequenced on an Illumina NextSeq 2000 platform 2x150bp

Bioinformatics Analysis:

Unassembled sequencing reads were directly analyzed by CosmosID-HUB Microbiome Platform (CosmosID Inc., Germantown, MD) described elsewhere (Ottensen et al., 2016, Ponnusamy et al., 2016, Hasan et al., 2014, Lax et al., 2014) for multi-kingdom microbiome analysis and profiling of antibiotic resistance and virulence genes and quantification of organisms' relative abundance. Briefly, the system utilizes curated genome databases and a high performance data-mining algorithm that rapidly disambiguates hundreds of millions of metagenomic sequence reads into the discrete microorganisms engendering the particular sequences. Similarly, the community resistome and virulome, the collection of antibiotic resistance and virulence associated genes in the microbiome, were also identified by querying the unassembled sequence reads against the CosmosID curated antibiotic resistance and virulence associated gene databases.

Fasta/q details

Name	Value
Hit	1339516

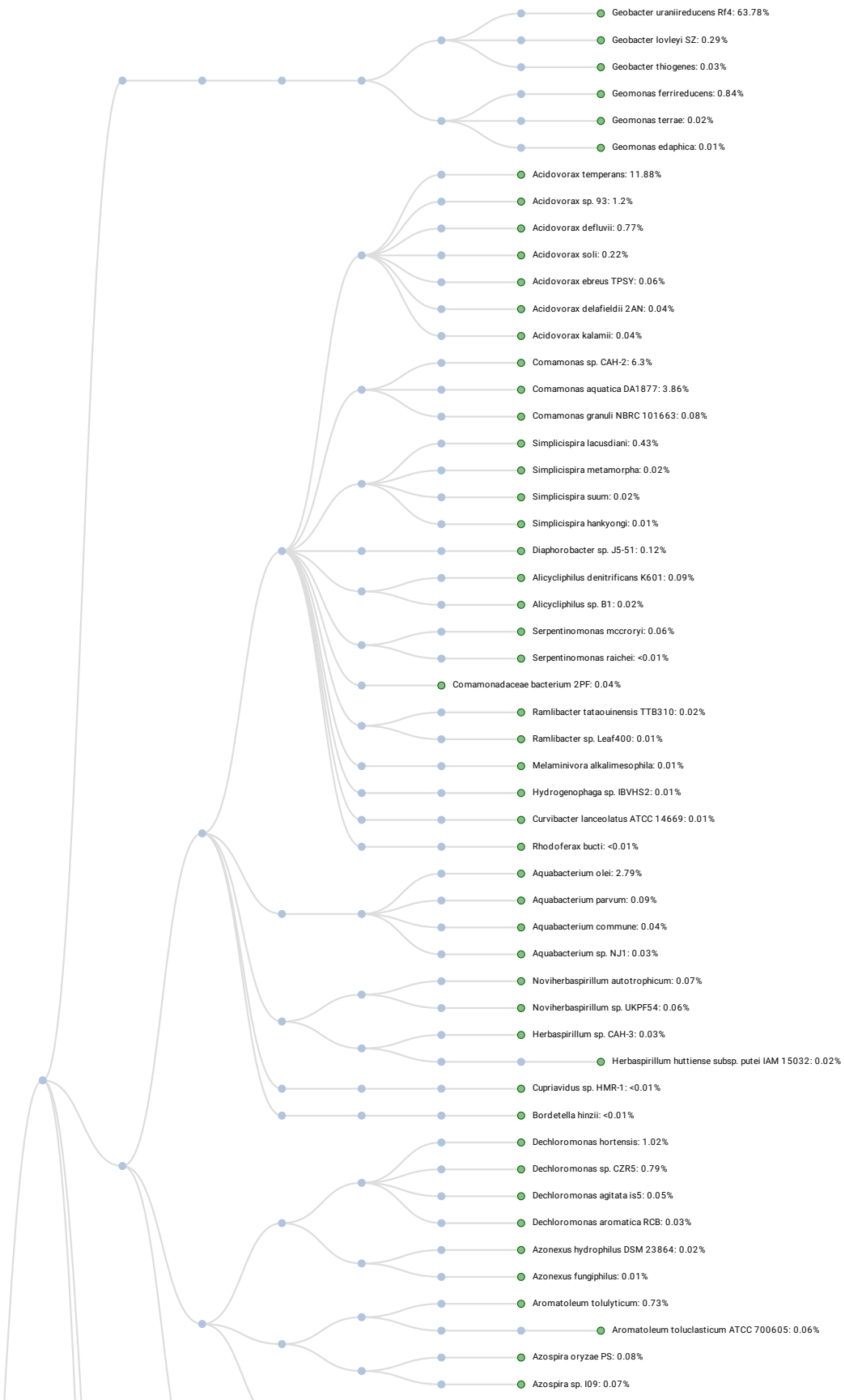
Table

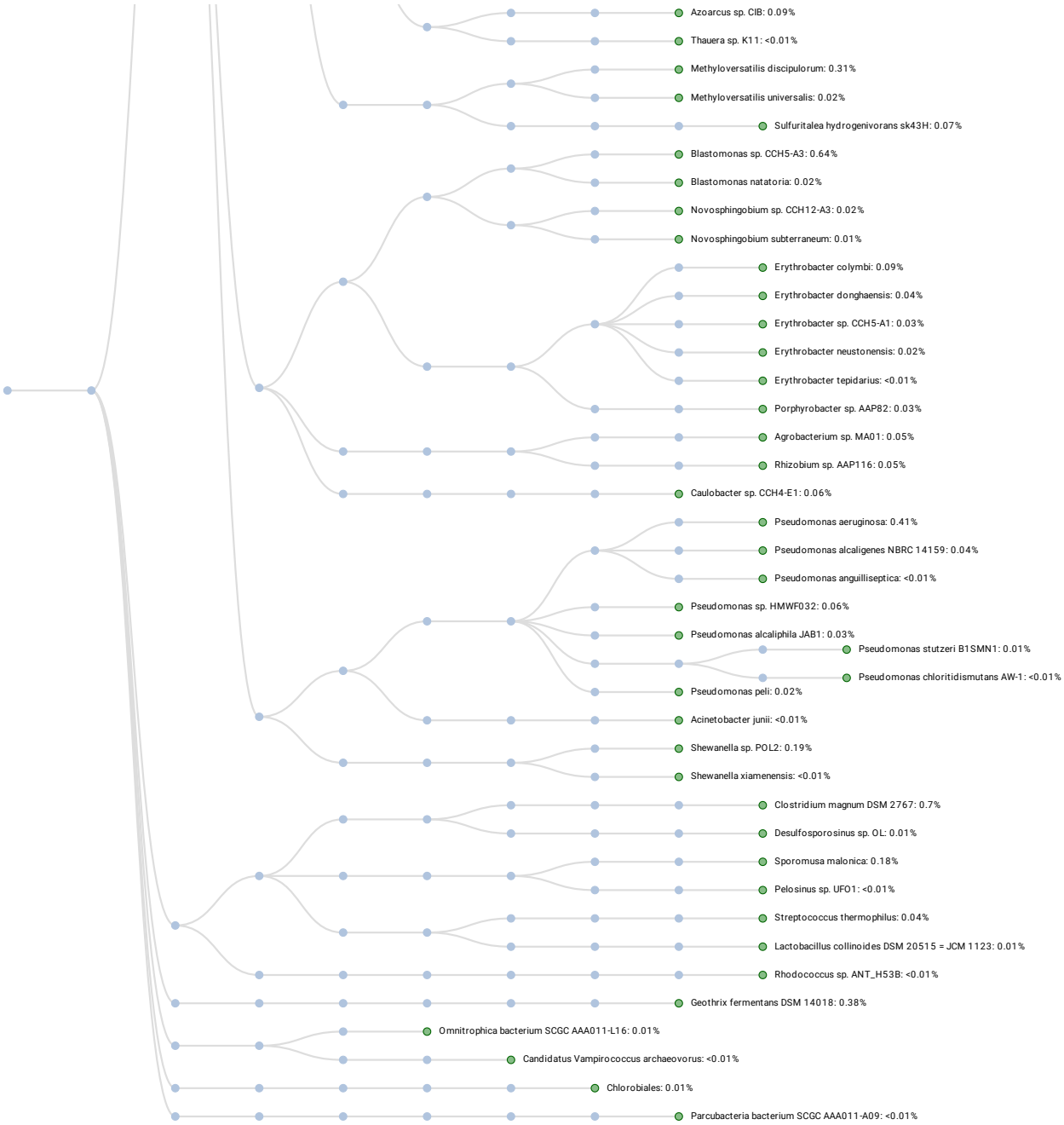
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Geobacter uraniireducens Rf4	351605	51087.48	63.78%	47.44	47.44	1989394
Acidovorax temperans	80878	9519.43	11.88%	43.30	43.39	243948
Comamonas sp. CAH-2	2605745	5048.31	6.30%	31.18	39.93	22016
Comamonas aquatica DA1877	1457173	3088.77	3.86%	5.00	25.52	3473
Aquabacterium olei	1296669	2231.17	2.79%	19.20	19.49	34484
Acidovorax sp. 93	2135632	961.69	1.20%	3.49	9.11	2547
Dechloromonas hortensis	337779	815.97	1.02%	7.92	8.04	12048
Geomonas ferrireducens	2570227	675.09	0.84%	6.26	6.75	7562
Dechloromonas sp. CZR5	2608630	632.55	0.79%	6.10	6.26	10522
Acidovorax defluvii	86669	618.83	0.77%	2.41	5.50	3942
Aromatoleum tolulyticum	34027	588.29	0.73%	4.51	5.73	8528
Clostridium magnum DSM 2767	1121326	559.03	0.70%	6.03	6.03	3566
Blastomonas sp. CCH5-A3	1768761	508.56	0.64%	5.46	5.21	750
Simplicispira lacusdiani	2213010	340.5	0.43%	2.08	2.30	9196
Pseudomonas aeruginosa	287	328.75	0.41%	5.98	5.98	151
Geothrix fermentans DSM 14018	1121920	302.53	0.38%	3.02	3.02	5300
Methyloversatilis discipulorum	1119528	248.95	0.31%	2.44	2.74	3845
Geobacter lovleyi SZ	398767	231.09	0.29%	0.53	0.79	9400
Acidovorax soli	592050	180.48	0.22%	1.79	1.58	3924
Shewanella sp. POL2	1201295	155.16	0.19%	1.56	2.06	234
Sporomusa malonica	112901	139.8	0.18%	1.76	1.76	1755
Diaphorobacter sp. J5-51	680496	95.01	0.12%	0.54	0.38	1530
Aquabacterium parvum	70584	73.43	0.09%	0.64	1.25	2800
Azoarcus sp. CIB	198107	72.34	0.09%	0.90	3.18	1688
Alicycliphilus denitrificans K601	596154	69.44	0.09%	0.95	0.49	496

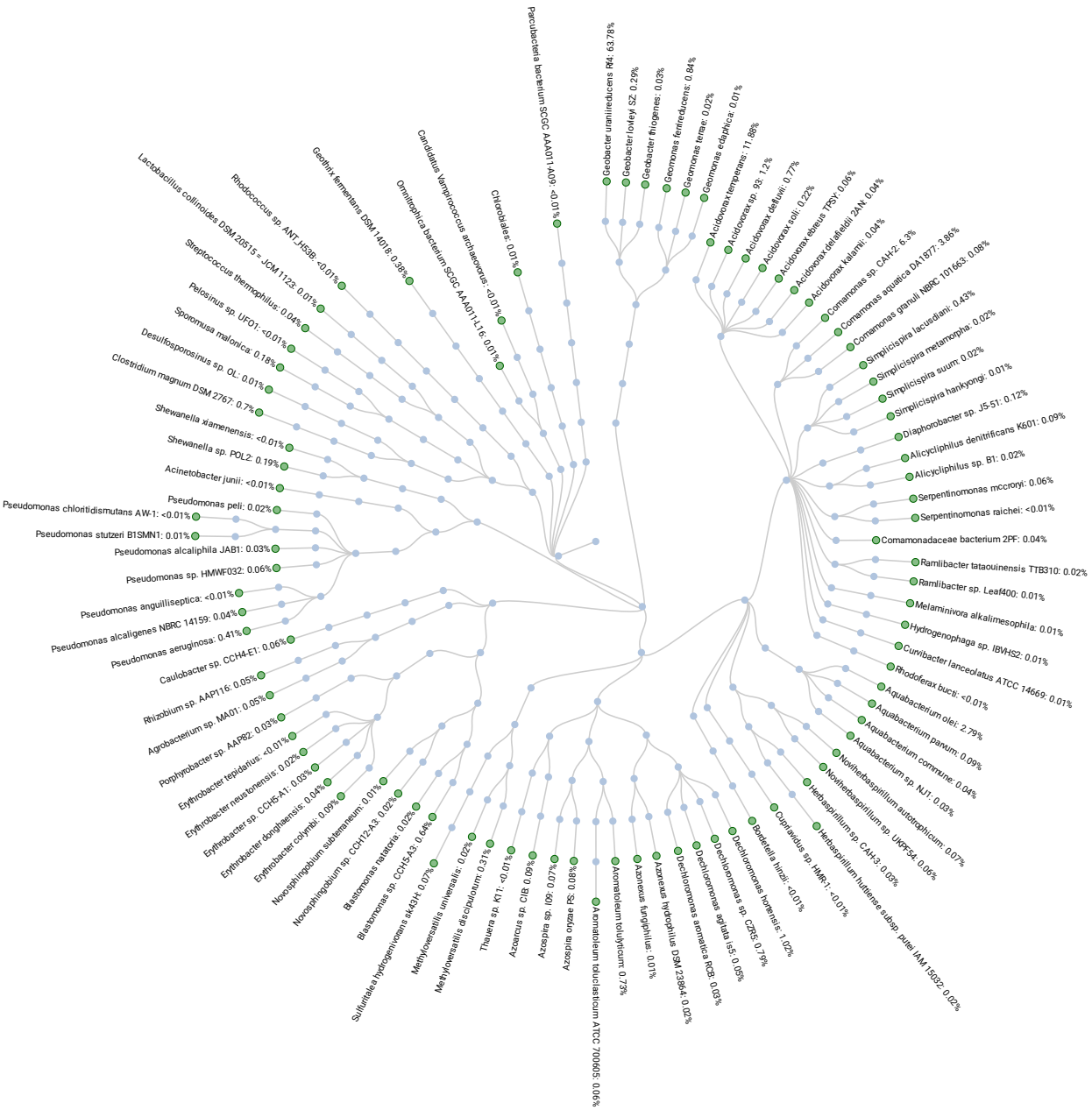
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Erythrobacter colymbi	1161202	69.1	0.09%	0.75	1.16	1800
Comamonas granuli NBRC 101663	1223521	61.86	0.08%	0.52	0.73	2163
Azospira oryzae PS	640081	60.01	0.08%	0.91	1.61	478
Azospira sp. I09	1765049	58.64	0.07%	0.91	1.65	426
Noviherbaspirillum autotrophicum	709839	54.95	0.07%	0.65	0.86	1635
Sulfuritalea hydrogenivorans sk43H	1223802	54.3	0.07%	0.65	0.65	1375
Aromatoleum toluclasticum ATCC 700605	1261621	50.57	0.06%	0.65	1.79	1286
Caulobacter sp. CCH4-E1	1768763	48.76	0.06%	0.77	0.76	100
Noviherbaspirillum sp. UKPF54	2601898	45.68	0.06%	0.54	0.76	1444
Pseudomonas sp. HMWF032	2056866	45.62	0.06%	0.61	0.69	907
Acidovorax ebreus TPSY	535289	44.56	0.06%	1.19	0.65	1597
Serpentinomonas mccroryi	1458426	45.06	0.06%	0.68	0.74	486
Agrobacterium sp. MA01	2664893	41.95	0.05%	0.72	1.86	239
Dechloromonas agitata is5	1304883	40.69	0.05%	0.53	0.69	911
Rhizobium sp. AAP116	1523429	36.95	0.05%	0.63	1.82	257
Aquabacterium commune	70586	34.98	0.04%	0.39	0.95	1252
Comamonadaceae bacterium 2PF	2502197	34.81	0.04%	0.45	0.83	924
Erythrobacter donghaensis	267135	30.33	0.04%	0.40	0.56	640
Streptococcus thermophilus	1308	30.56	0.04%	0.20	0.18	20
Acidovorax delafieldii 2AN	573060	29.44	0.04%	0.26	0.26	1505
Pseudomonas alcaligenes NBRC 14159	1215092	30.01	0.04%	0.49	0.77	324
Acidovorax kalamii	2004485	29.16	0.04%	0.32	0.42	981
Herbaspirillum sp. CAH-3	2605746	28.38	0.03%	0.43	0.52	557
Pseudomonas alcaliphila JAB1	741155	26.4	0.03%	0.44	0.78	242
Dechloromonas aromatica RCB	159087	25.65	0.03%	0.35	0.40	703
Geobacter thiogenes	115783	23.1	0.03%	0.40	0.71	6364
Aquabacterium sp. NJ1	1538295	22.45	0.03%	0.27	0.28	918
Erythrobacter sp. CCH5-A1	1768792	22.27	0.03%	0.42	0.59	80
Porphyrobacter sp. AAP82	1248917	22.18	0.03%	0.31	0.42	437

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Blastomonas natatoria	34015	18.54	0.02%	0.28	1.20	425
Simplicispira metamorpha	80881	17.6	0.02%	0.18	1.01	721
Novosphingobium sp. CCH12-A3	1768752	17.24	0.02%	0.19	0.27	545
Methyloversatilis universalis	378211	16.88	0.02%	0.29	0.34	51
Ramlibacter tataouinensis TTB310	365046	16.39	0.02%	0.16	0.17	806
Alicycliphilus sp. B1	1603291	15.36	0.02%	0.20	0.25	281
Geomonas terrae	2562681	14.18	0.02%	0.20	1.79	359
Azonexus hydrophilus DSM 23864	1121032	12.67	0.02%	0.20	0.23	322
Simplicispira suum	2109915	11.62	0.02%	0.12	0.13	589
Herbaspirillum huttiense subsp. putei IAM 15032	1235558	11.62	0.02%	0.21	0.43	171
Erythrobacter neustonensis	1112	12.06	0.02%	0.18	0.18	310
Pseudomonas peli	592361	12.37	0.02%	0.21	0.31	265
Geomonas edaphica	2570226	11.57	0.01%	0.20	1.86	226
Ramlibacter sp. Leaf400	1736365	11.39	0.01%	0.11	0.13	716
Melaminivora alkalimesophila	1165852	10.97	0.01%	0.12	0.13	402
Simplicispira hankyongi	2315688	11.18	0.01%	0.11	0.14	562
Azonexus fungiphilus	146940	11.13	0.01%	0.17	0.21	316
Desulfosporosinus sp. OL	1888891	10.45	0.01%	0.18	0.19	214
Hydrogenophaga sp. IBVHS2	1985170	9.41	0.01%	0.15	0.15	226
Novosphingobium subterraneum	48936	9.56	0.01%	0.19	0.53	123
Pseudomonas stutzeri B1SMN1	1212549	9.33	0.01%	0.17	0.11	97
Chlorobiales	191411	9.54	0.01%	100.00	100.00	2
Curvibacter lanceolatus ATCC 14669	1265504	9.21	0.01%	0.13	0.18	345
Omnitrophica bacterium SCGC AAA011-L16	1047010	8.77	0.01%	0.27	0.27	20
Lactobacillus collinoides DSM 20515 = JCM 1123	1423733	7.74	0.01%	0.13	0.14	198
Rhodoferax bucti	2576305	7.37	<0.01%	0.15	0.15	640
Cupriavidus sp. HMR-1	1249621	7.06	<0.01%	0.11	0.35	125
Erythrobacter tepidarius	60454	6.29	<0.01%	0.11	0.11	167

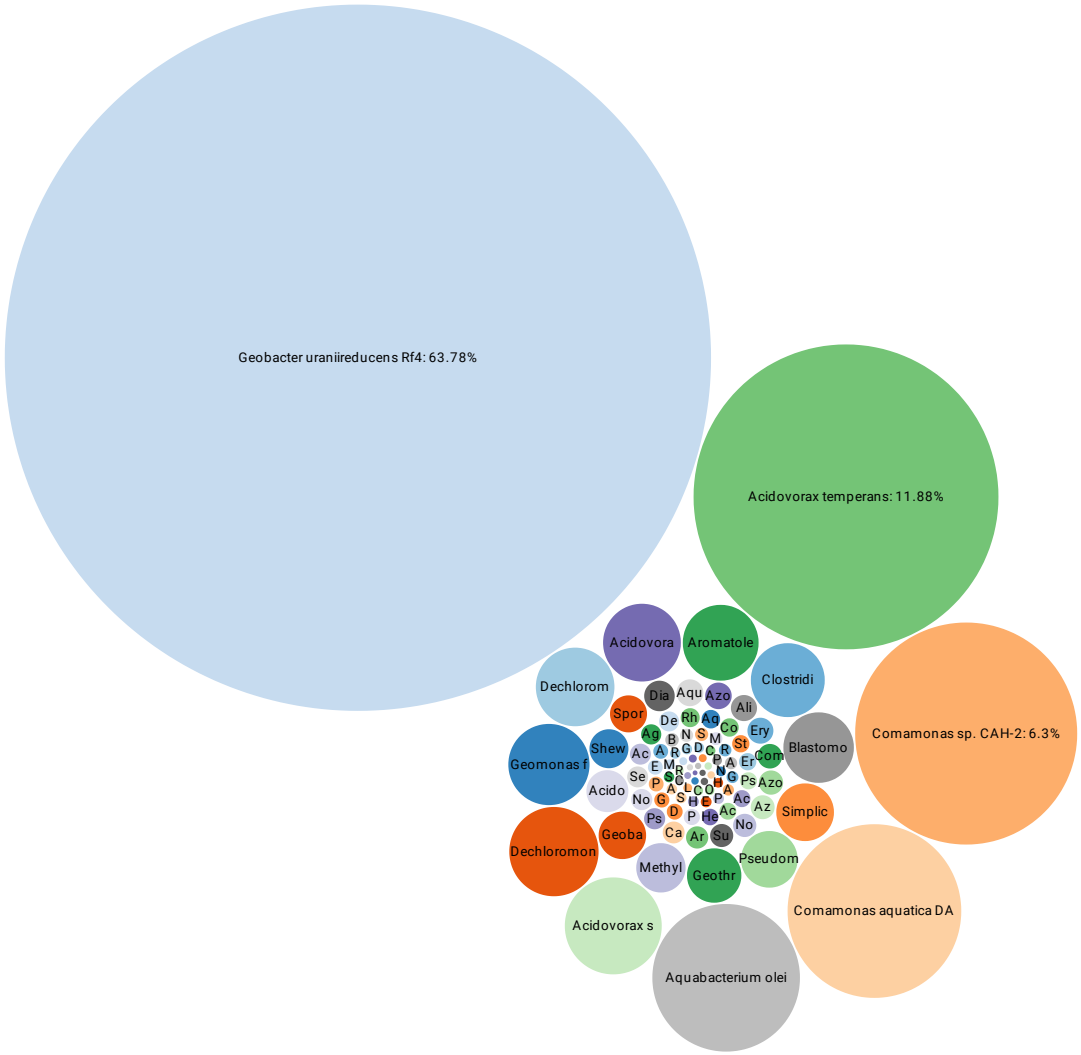
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Pseudomonas anguilliseptica	53406	6.56	<0.01%	0.11	0.20	186
Pelosinus sp. UFO1	484770	6.49	<0.01%	0.13	0.13	109
Serpentinomonas raichei	1458425	5.85	<0.01%	0.13	0.14	16
Pseudomonas chloritidismutans AW-1	1263865	5.91	<0.01%	0.13	0.11	66
Rhodococcus sp. ANT_H53B	2597357	5.54	<0.01%	0.11	0.20	109
Candidatus Vampirococcus archaeovorus	1930593	6	<0.01%	0.11	0.11	113
Thauera sp. K11	2005884	5.19	<0.01%	0.10	0.11	271
Bordetella hinzii	103855	3.96	<0.01%	0.15	0.12	13
Acinetobacter junii	40215	3.98	<0.01%	0.16	0.28	10
Shewanella xiamenensis	332186	3.86	<0.01%	0.11	1.38	25
Parcubacteria bacterium SCGC AAA011-A09	1046987	2.21	<0.01%	0.10	0.10	7


Geobacter uraniireducens Rf4: 63.78%
Geobacter lovleyi SZ: 0.29%
Geobacter thiogenes: 0.03%
Geomonas ferrireducens: 0.84%
Geomonas terrae: 0.02%
Geomonas edaphica: 0.01%
Acidovorax temperans: 11.88%
Acidovorax sp. 93: 1.2%
Acidovorax defluvii: 0.77%
Acidovorax soli: 0.22%
Acidovorax ebreus TPSY: 0.06%
Acidovorax delafieldii 2AN: 0.04%
Acidovorax kalamii: 0.04%
Comamonas sp. CAH-2: 6.3%
Comamonas aquatica DA1877: 3.86%
Comamonas granuli NBRC 101663: 0.08%
Simplicispira lacusdiani: 0.43%
Simplicispira metamorpha: 0.02%
Simplicispira suum: 0.02%
Simplicispira hankyongi: 0.01%
Diaphorobacter sp. J5-51: 0.12%
Alicycliphilus denitrificans K601: 0.09%
Alicycliphilus sp. B1: 0.02%
Serpentinomonas mccroryi: 0.06%
Serpentinomonas raichei: <0.01%
Comamonadaceae bacterium 2PF: 0.04%
Ramlibacter tataouinensis TTB310: 0.02%
Ramlibacter sp. Leaf400: 0.01%
Melaminivora alkalimesophila: 0.01%
Hydrogenophaga sp. IBVHS2: 0.01%
Curvibacter lanceolatus ATCC 14669: 0.01%
Rhodoferax bucti: <0.01%
Aquabacterium olei: 2.79%
Aquabacterium parvum: 0.09%
Aquabacterium commune: 0.04%
Aquabacterium sp. NJ1: 0.03%
Noviherbaspirillum autotrophicum: 0.07%
Noviherbaspirillum sp. UKPF54: 0.06%
Herbaspirillum sp. CAH-3: 0.03%
Herbaspirillum huttiense subsp. putei IAM 15032: 0.02%
Cupriavidus sp. HMR-1: <0.01%
Bordetella hinzii: <0.01%
Dechloromonas hortensis: 1.02%
Dechloromonas sp. CZR5: 0.79%
Dechloromonas agitata is5: 0.05%
Dechloromonas aromatica RCB: 0.03%
Azonexus hydrophilus DSM 23864: 0.02%
Azonexus fungiphilus: 0.01%
Aromatoleum tolulyticum: 0.73%
Aromatoleum toluclasticum ATCC 700605: 0.06%
Azospira oryzae PS: 0.08%
Azospira sp. I09: 0.07%


Azoarcus sp. CIB: 0.09%
Thauera sp. K11: <0.01%
Methyloversatilis discipulorum: 0.31%
Methyloversatilis universalis: 0.02%
Sulfuritalea hydrogenivorans sk43H: 0.07%
Blastomonas sp. CCH5-A3: 0.64%
Blastomonas natatoria: 0.02%
Novosphingobium sp. CCH12-A3: 0.02%
Novosphingobium subterraneum: 0.01%
Erythrobacter colymbi: 0.09%
Erythrobacter donghaensis: 0.04%
Erythrobacter sp. CCH5-A1: 0.03%
Erythrobacter neustonensis: 0.02%
Erythrobacter tepidarius: <0.01%
Porphyrobacter sp. AAP82: 0.03%
Agrobacterium sp. MA01: 0.05%
Rhizobium sp. AAP116: 0.05%
Caulobacter sp. CCH4-E1: 0.06%
Pseudomonas aeruginosa: 0.41%
Pseudomonas alcaligenes NBRC 14159: 0.04%
Pseudomonas anguilliseptica: <0.01%
Pseudomonas sp. HMWF032: 0.06%
Pseudomonas alcaliphila JAB1: 0.03%
Pseudomonas stutzeri B1SMN1: 0.01%
Pseudomonas chloritidismutans AW-1: <0.01%
Pseudomonas peli: 0.02%
Acinetobacter junii: <0.01%
Shewanella sp. POL2: 0.19%
Shewanella xiamenensis: <0.01%
Clostridium magnum DSM 2767: 0.7%
Desulfosporosinus sp. OL: 0.01%
Sporomusa malonica: 0.18%
Pelosinus sp. UFO1: <0.01%
Streptococcus thermophilus: 0.04%
Lactobacillus collinoides DSM 20515 = JCM 1123: 0.01%
Rhodococcus sp. ANT_H53B: <0.01%
Geothrix fermentans DSM 14018: 0.38%
Omnitrophica bacterium SCGC AAA011-L16: 0.01%
Candidatus Vampirococcus archaeovorus: <0.01%
Chlorobiales: 0.01%
Parcubacteria bacterium SCGC AAA011-A09: <0.01%


Parcubacteria bacterium SCGC AAA011-A09: <0.01%
Chloroidales: 0.01%
Candidatus Vampirococcus archaeovorus: <0.01%
Omnitrophica bacterium SCGC AAA011-L16: 0.01%
Geothrix fermentans DSM 14018: 0.38%
Rhodococcus sp. ANT_H53B: <0.01%
Lactobacillus collinoides DSM 20515 = JCM 1123: 0.01%
Streptococcus thermophilus: 0.04%
Pelosinus sp. UFO1: <0.01%
Sporomusa malonica: 0.18%
Desulfosporosinus sp. OL: 0.01%
Clostridium magnum DSM 2767: 0.7%
Shewanella xiamenensis: <0.01%
Shewanella sp. POL2: 0.19%
Acinetobacter junii: <0.01%
Pseudomonas peli: 0.02%
Pseudomonas chloritidismutans AW-1: <0.01%
Pseudomonas stutzeri B1SMN1: 0.01%
Pseudomonas alcaliphila JAB1: 0.03%
Pseudomonas sp. HMWF032: 0.06%
Pseudomonas anguilliseptica: <0.01%
Pseudomonas alcaligenes NBRC 14159: 0.04%
Pseudomonas aeruginosa: 0.41%
Caulobacter sp. CCH4-E1: 0.06%
Rhizobium sp. AAP116: 0.05%
Agrobacterium sp. MA01: 0.05%
Porphyrobacter sp. AAP82: 0.03%
Erythrobacter tepidarius: <0.01%
Erythrobacter neustonensis: 0.02%
Erythrobacter sp. CCH5-A1: 0.03%
Erythrobacter donghaensis: 0.04%
Erythrobacter colymbi: 0.09%
Novosphingobium subterraneum: 0.01%
Novosphingobium sp. CCH12-A3: 0.02%
Blastomonas natatoria: 0.02%
Blastomonas sp. CCH15-A3: 0.64%
Sulfuritalea hydrogenivorans sk43H: 0.07%
Methyloversatilis universalis: 0.02%
Methyloversatilis discipulorum: 0.31%
Thauera sp. K11: <0.01%
Azoarcus sp. CIB: 0.09%
Azospira sp. I09: 0.07%
Azospira oryzae PS: 0.08%
Aromatoleum toluvitcum: 0.73%
Aromatoleum toluclasticum ATCC 700605: 0.06%
Azoarcus toluvorans: 0.01%
Dechloromonas hydrophilus DSM 23864: 0.02%
Dechloromonas aromatica RCB: 0.03%
Dechloromonas agitata is5: 0.05%
Dechloromonas sp. C2PS: 0.79%
Boudetella hinzii: <0.01%
Cupriavidus sp. HMR-1: <0.01%
Herbaspirillum sp. CAH-3: 0.03%
Herbaspirillum huttiense subsp. putei IAM 15032: 0.02%
Herbaspirillum autotrophicum: 0.07%
Herbaspirillum sp. UKPF54: 0.06%
Aquabacterium commune: 0.04%
Aquabacterium sp. NJ1: 0.03%
Aquabacterium parvum: 0.09%
Aquabacterium olei: 2.79%
Rhodoferax bucti: <0.01%
Curvibacter lanceolatus ATCC 14669: 0.01%
Hydrogenophaga sp. IBVHS2: 0.01%
Melaminivora alkalimesophila: 0.01%
Ramlibacter sp. Leaf400: 0.01%
Ramlibacter tataouinensis TTB310: 0.02%
Comamonadaceae bacterium 2PF: 0.04%
Serpentinomonas raichei: <0.01%
Serpentinomonas mccroryi: 0.06%
Alicycliphilus sp. B1: 0.02%
Alicycliphilus denitrificans K601: 0.09%
Diaphorobacter sp. JS-51: 0.12%
Simplicispira hankyongi: 0.01%
Simplicispira suum: 0.02%
Simplicispira metamorpha: 0.02%
Simplicispira lacusdiani: 0.43%
Comamonas granuli NBRC 101663: 0.08%
Comamonas aquatica DA1877: 3.86%
Comamonas sp. CAH-2: 6.3%
Acidovorax delafieldii 2AN: 0.04%
Acidovorax ebreus TPSY: 0.06%
Acidovorax soli: 0.22%
Acidovorax defluvii: 0.77%
Acidovorax sp. 93: 1.2%
Acidovorax temperans: 11.88%
Acidovorax edaphicus: 0.01%
Geomonas terrae: 0.02%
Geomonas ferrireducens: 0.84%
Geomonas diazotrophica: 0.03%
Geobacter luteyl SZ: 0.29%
Geobacter uraniireducens Rf4: 63.78%


Bacteria
Proteobacteria
Geobacter uraniireducens Rf4 - 63.78%
11.88% - Acidovorax temperans
1.2% - Acidovorax sp. 93
5 more
6.3% - Comamonas sp. CAH-2
3.86% - Comamonas aquatica DA1877
2.79% - Aquabacterium olei
1.02% - Dechloromonas hortensis
Geobact..educens
Geobacter
Geobacteraceae
Desulfu..nadales
Deltapr..acteria
delta/e..visions
Acidovo..mperans
Acidovorax
Betapro..acteria
Burkholderiales
Comamonadaceae
Comamonas
uncla..monas
Co..ca
R..s
B..s
A..m
A..l
2 more
13 more
6 more
16 more


Geobacter uraniireducens Rf4: 63.78%
Acidovorax temperans: 11.88%
Comamonas sp. CAH-2: 6.3%
Comamonas aquatica DA
Aquabacterium olei
Acidovorax s
Dechloromon
Geomonas f
Acidovora
Aromatole
Dechlorom
Clostridi
Blastomo
Simplic
Pseudom
Geothr
Methyl
Geoba
Shew
Acido
Spor

Fasta/q details

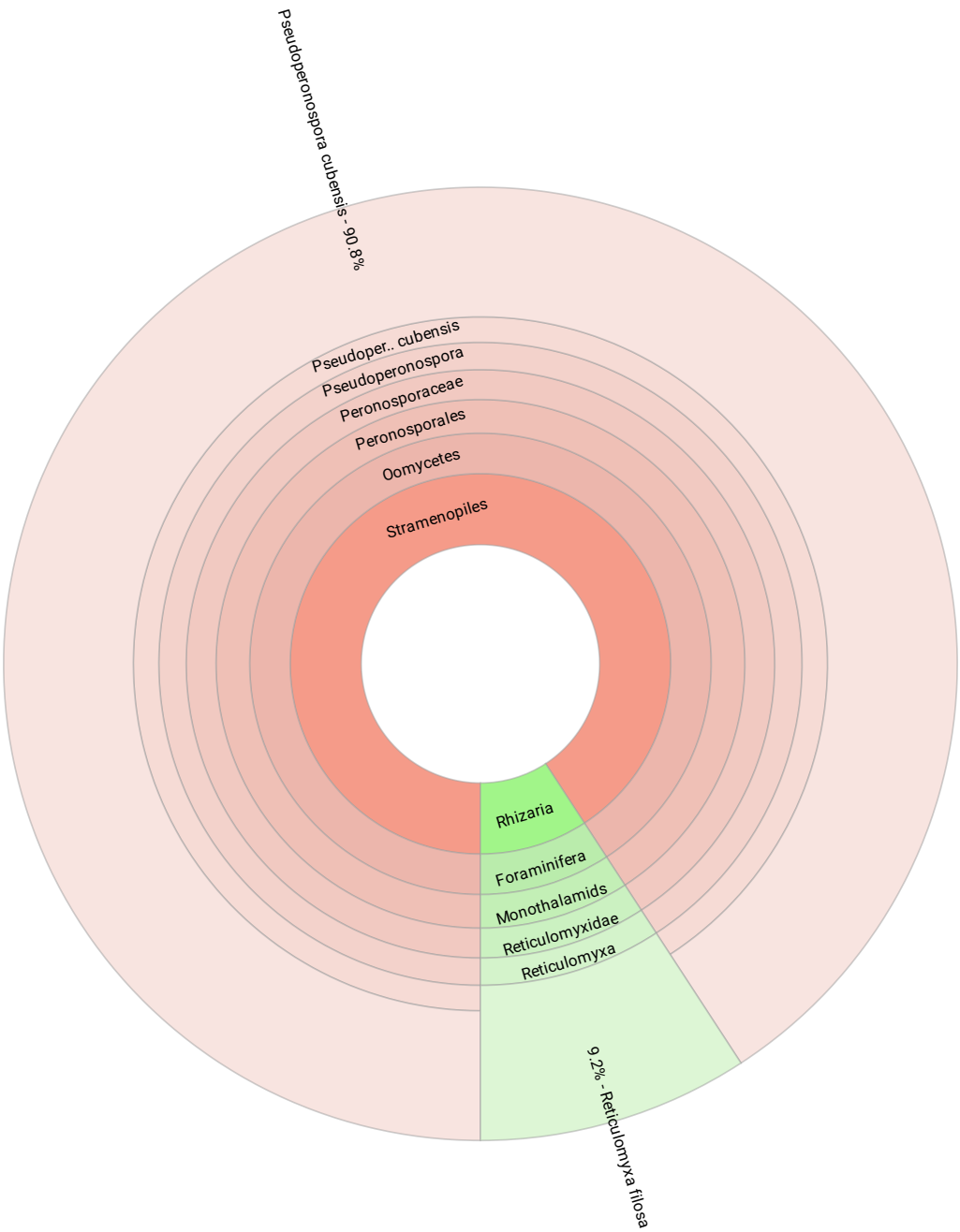
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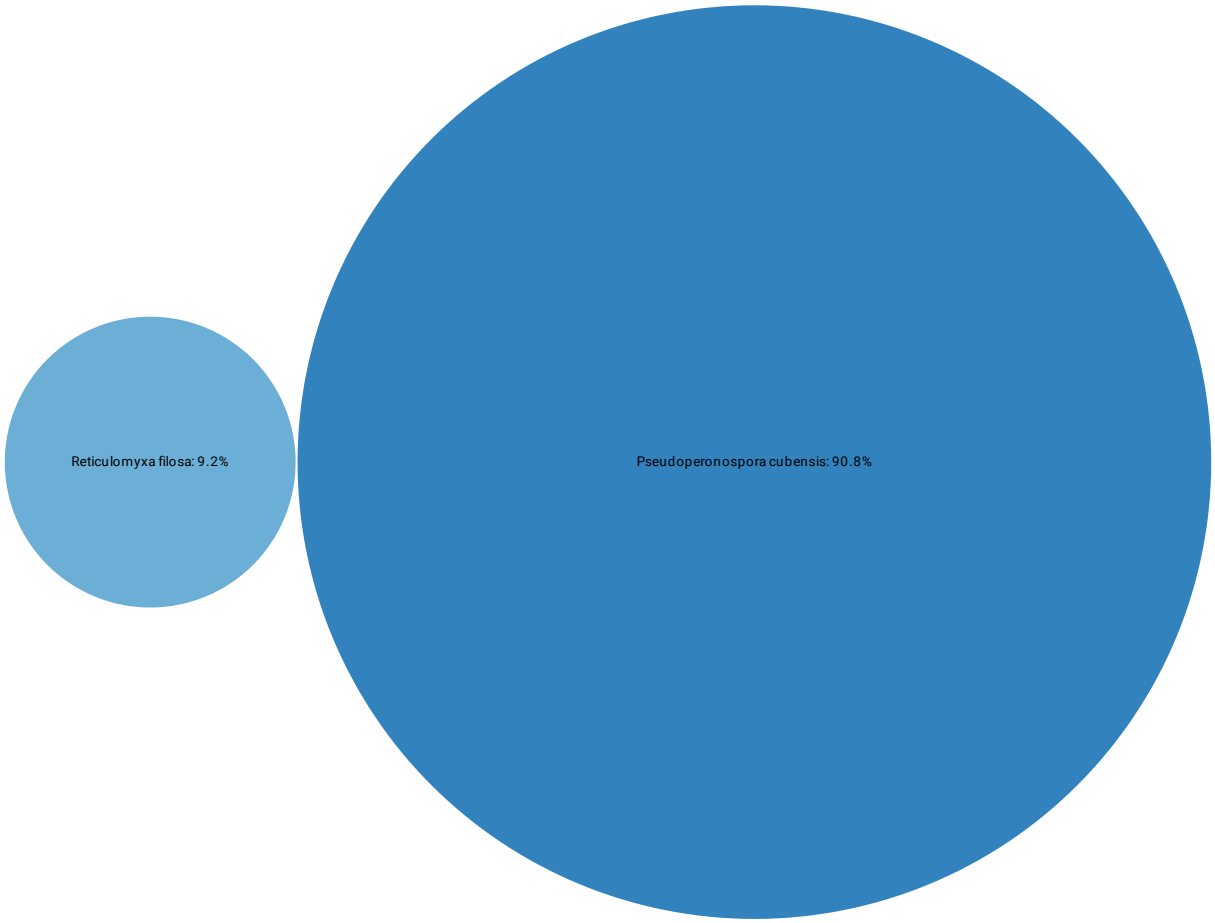
Table

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Pseudoperonospora cubensis	143453	31.39	90.80%	0.30	0.34	1540
Reticulomyxa filosa	46433	3.18	9.20%	0.01	0.02	379


Pseudoperonospora cubensis: 90.8%
Reticulomyxa filosa: 9.2%


leticulomyxa filosa: 9.2%
Pseudoperonospora cubensis: 90.8%


Pseudoperonospora cubensis - 90.8%
Pseudoper.. cubensis
Pseudoperonospora
Peronosporaceae
Peronosporales
Oomycetes
Stramenopiles
Rhizaria
Foraminifera
Monothalamids
Reticulomyxidae
Reticulomyxa
9.2% - Reticulomyxa filosa

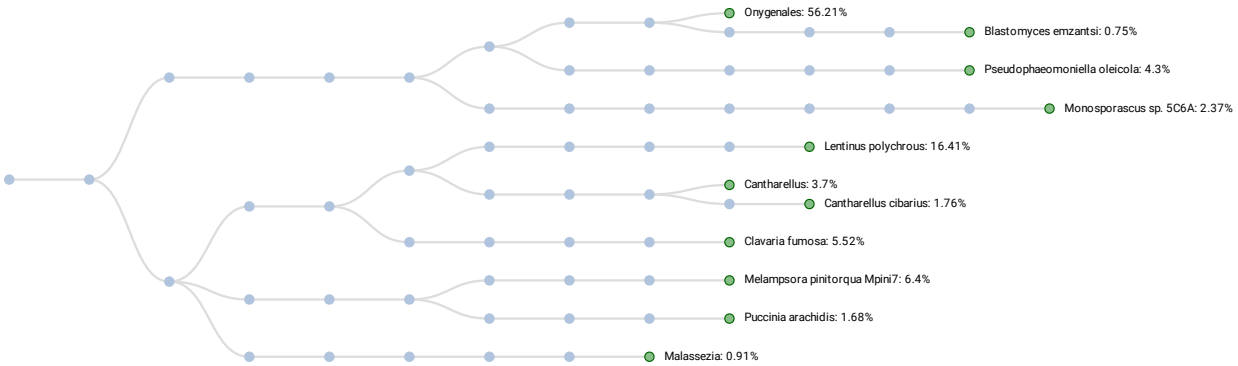

Reticulomyxa filosa: 9.2%
Pseudoperonospora cubensis: 90.8%

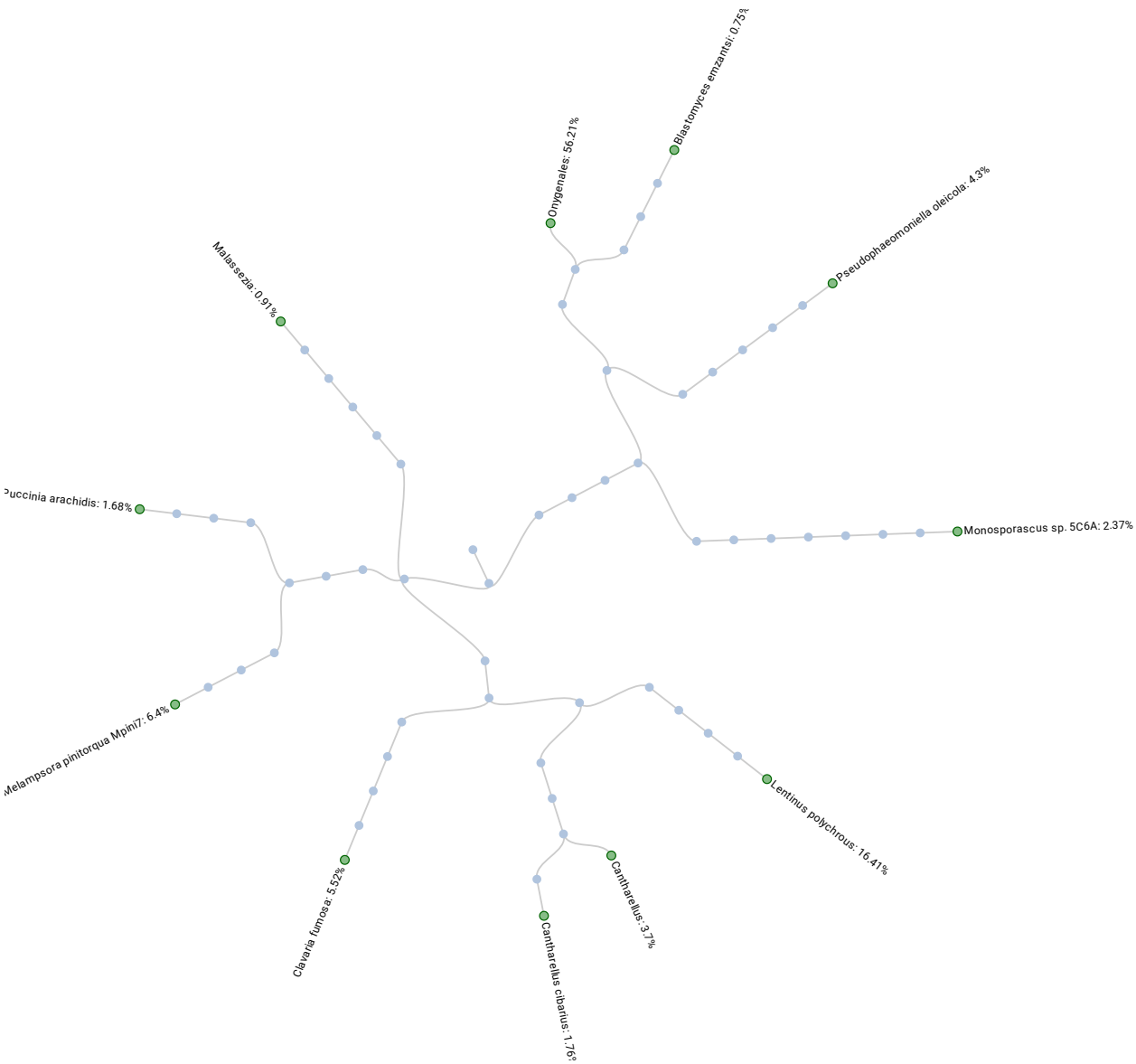
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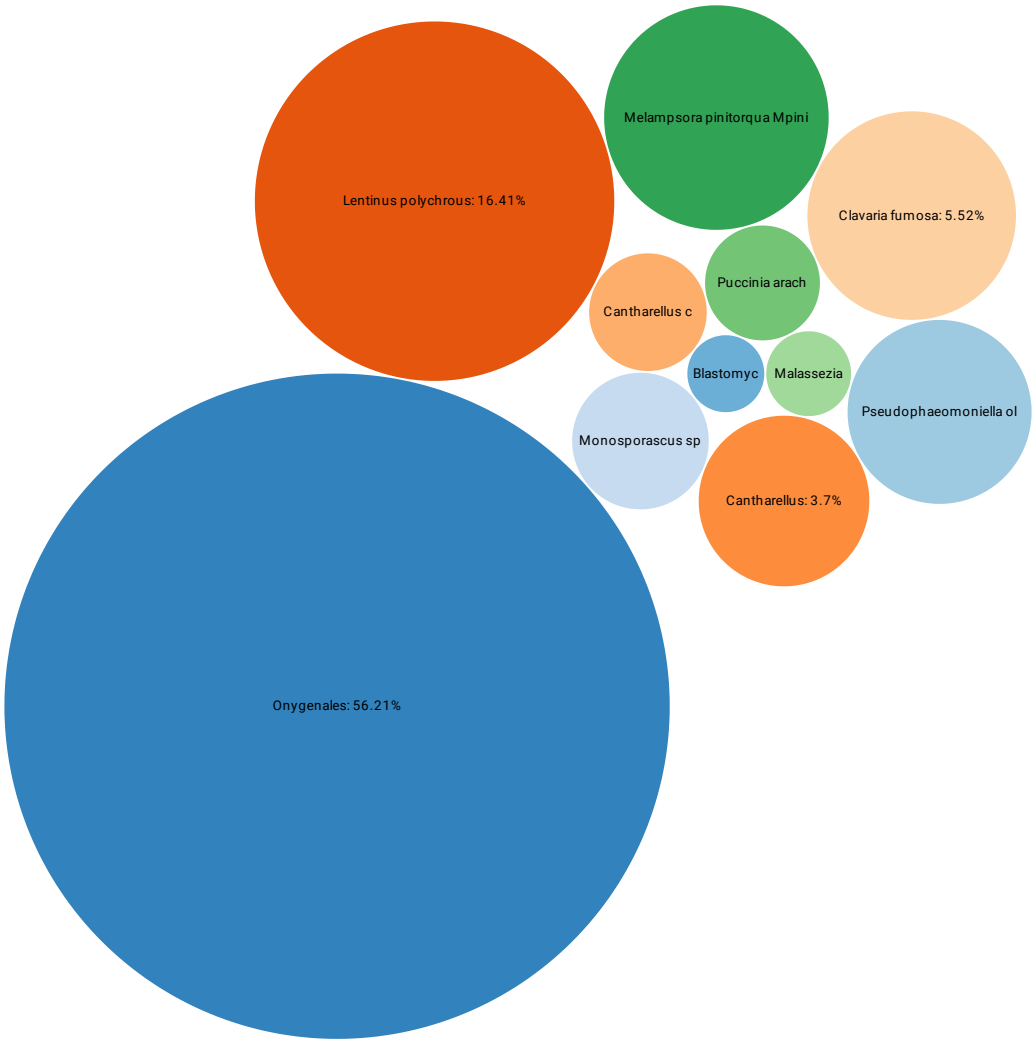
Table

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Onygenales	33183	48.65	56.21%	0.29	0.46	2209
Lentinus polychrous	292559	14.2	16.41%	0.13	0.14	896
Melampsora pinitorqua Mpini7	1298852	5.54	6.40%	0.09	0.08	241
Clavaria fumosa	264083	4.78	5.52%	0.06	0.12	317
Pseudophaeomoniella oleicola	1671306	3.72	4.30%	0.02	0.02	403
Cantharellus	36065	3.2	3.70%	0.06	0.06	45
Monosporascus sp. 5C6A	2211642	2.05	2.37%	0.04	0.06	114
Cantharellus cibarius	36066	1.52	1.76%	0.03	0.04	87
Puccinia arachidis	333523	1.45	1.68%	0.03	0.06	98
Malassezia	55193	0.79	0.91%	0.01	0.01	31
Blastomyces emzantsi	2723674	0.65	0.75%	0.02	0.01	36


Onygenales: 56.21%
Blastomyces emzantsi: 0.75%
Pseudophaeomoniella oleicola: 4.3%
Monosporascus sp. 5C6A: 2.37%
Lentinus polychrous: 16.41%
Cantharellus: 3.7%
Cantharellus cibarius: 1.76%
Clavaria fumosa: 5.52%
Melampsora pinitorqua Mpini7: 6.4%
Puccinia arachidis: 1.68%
Malassezia: 0.91%


Blastomyces emzantsi: 0.75%
Onygenales: 56.21%
Pseudophaeomoniella oleicola: 4.3%
Malassezia: 0.91%
Puccinia arachidis: 1.68%
Monosporascus sp. 5C6A: 2.37%
Melampsora pinitorqua Mpini7: 6.4%
Lentinus polychrous: 16.41%
Clavaria fumosa: 5.52%
Cantharellus: 3.7%
Cantharellus cibarius: 1.76%


4.3% - Pseudophaeomoniella oleicola
2.37% - Monosporascus sp. 5C6A
16.41% - Lentinus polychrous
3.7% - Cantharellus
1.76% - Cantharellus cibarius
5.52% - Clavaria fumosa
6.4% - Melampsora pinitorqua Mpin17
1.68% - Puccinia arachidis
Onygenales - 56.21%
Dikarya
Basidiomycota
Agaricomycotina
Agaricomycetes
Polyporales
Polyporaceae
Lentinus
Lentin..chrous
Ascomycota
saccharomyceta
Pezizomycotina
leotiomycetes
Eurotiomycetes
Eurot..etidae
Onygenales
Pse..ola
Pse..lla
Pha..eae
Pha..les
Ch..ae
Puccin..cotina
Pucciniomycetes
Puccinia..les
Mela..ceae
Melampsora
Melam..orqua
Aga..dae
Aga..les
Clav..ceae
Clavaria
Can..les
Cant..ceae
Cant..llus

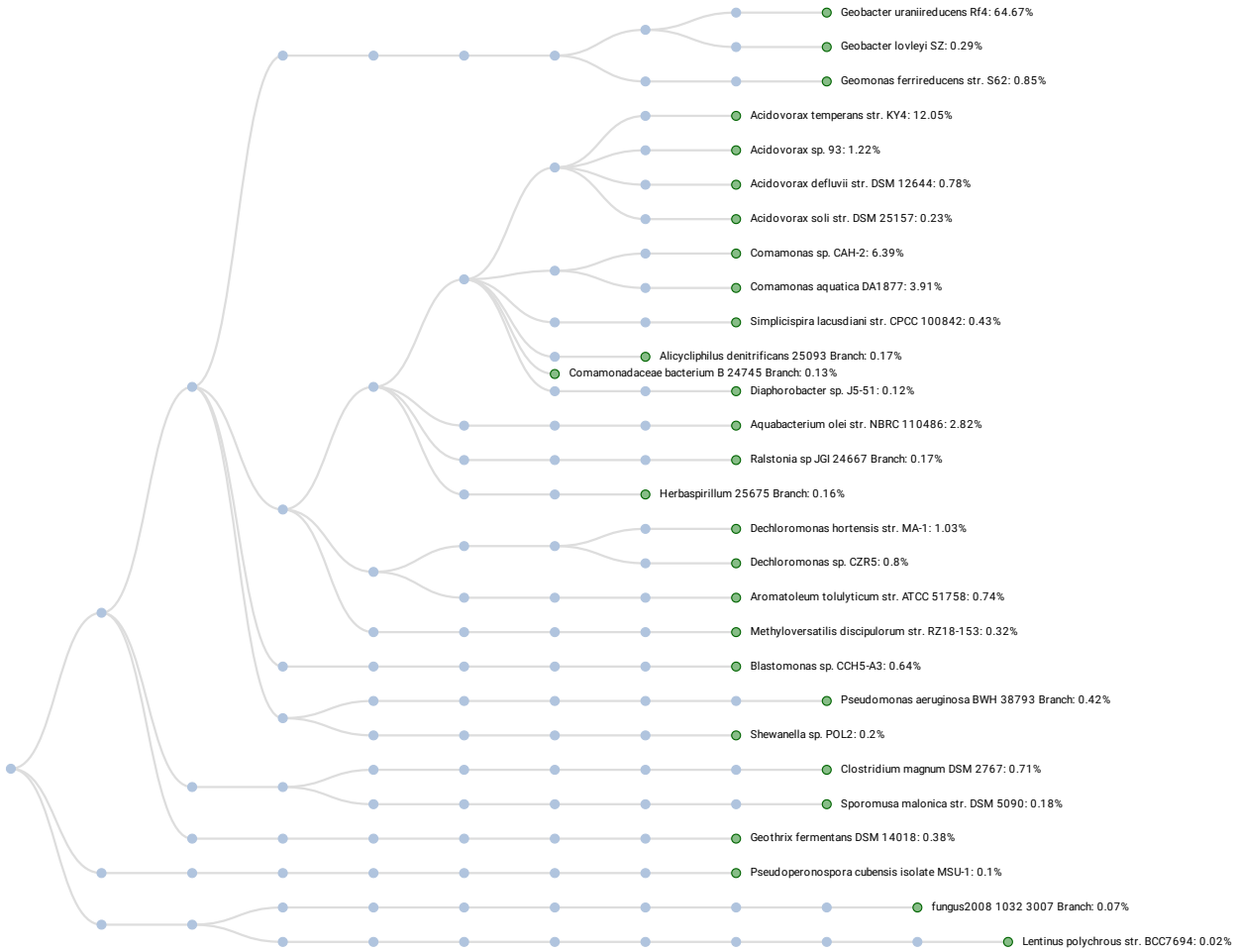

Lentinus polychrous: 16.41%
Melampsora pinitorqua Mpini
Clavaria fumosa: 5.52%
Puccinia arach
Cantharellus c
Blastomyc
Malassezia
Pseudophaeomoniella ol
Monosporascus sp
Cantharellus: 3.7%
Onygenales: 56.21%

Table

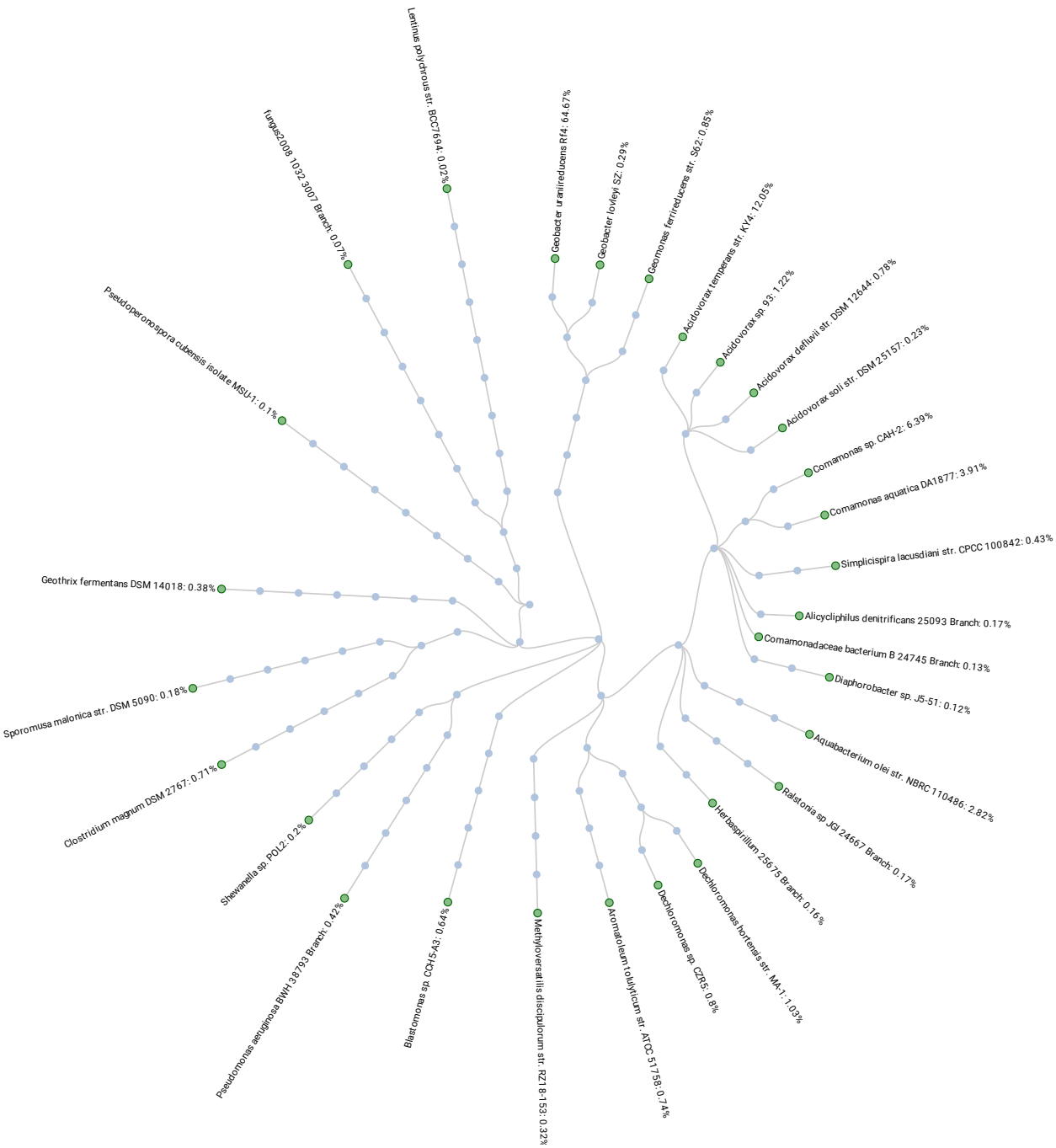
Table

Name	Taxonomy Id	Kingdom	Unified RA	% Unique Matches	% Total Matches
Geobacter uraniireducens Rf4	351605	Bacteria	64.67%	47.44	47.44
Acidovorax temperans	80878	Bacteria	12.05%	43.30	43.39
Comamonas sp. CAH-2	2605745	Bacteria	6.39%	31.18	39.93
Comamonas aquatica DA1877	1457173	Bacteria	3.91%	5.00	25.52
Aquabacterium olei	1296669	Bacteria	2.82%	19.20	19.49
Acidovorax sp. 93	2135632	Bacteria	1.22%	3.49	9.11
Dechloromonas hortensis	337779	Bacteria	1.03%	7.92	8.04
Geomonas ferrireducens	2570227	Bacteria	0.85%	6.26	6.75
Dechloromonas sp. CZR5	2608630	Bacteria	0.80%	6.10	6.26
Acidovorax defluvii	86669	Bacteria	0.78%	2.41	5.50
Aromatoleum tolulyticum	34027	Bacteria	0.74%	4.51	5.73
Clostridium magnum DSM 2767	1121326	Bacteria	0.71%	6.03	6.03
Blastomonas sp. CCH5-A3	1768761	Bacteria	0.64%	5.46	5.21
Simplicispira lacusdiani	2213010	Bacteria	0.43%	2.08	2.30
Pseudomonas aeruginosa	287	Bacteria	0.42%	5.98	5.98
Geothrix fermentans DSM 14018	1121920	Bacteria	0.38%	3.02	3.02
Methyloversatilis discipulorum	1119528	Bacteria	0.32%	2.44	2.74
Geobacter lovleyi SZ	398767	Bacteria	0.29%	0.53	0.79
Acidovorax soli	592050	Bacteria	0.23%	1.79	1.58
Shewanella sp. POL2	1201295	Bacteria	0.20%	1.56	2.06
Sporomusa malonica	112901	Bacteria	0.18%	1.76	1.76
Alicycliphilus	201096	Bacteria	0.17%	0.17	0.17
unclassified Ralstonia	209769	Bacteria	0.17%	4.44	4.44
Herbaspirillum	963	Bacteria	0.16%	1.54	1.57
Comamonadaceae	80864	Bacteria	0.13%	1.02	0.99
Diaphorobacter sp. J5-51	680496	Bacteria	0.12%	0.54	0.38
Pseudoperonospora cubensis	143453	Protists	0.10%	0.30	0.34
Onygenales	33183	Fungi	0.07%	0.29	0.46
Lentinus polychrous	292559	Fungi	0.02%	0.13	0.14

Tree Chart

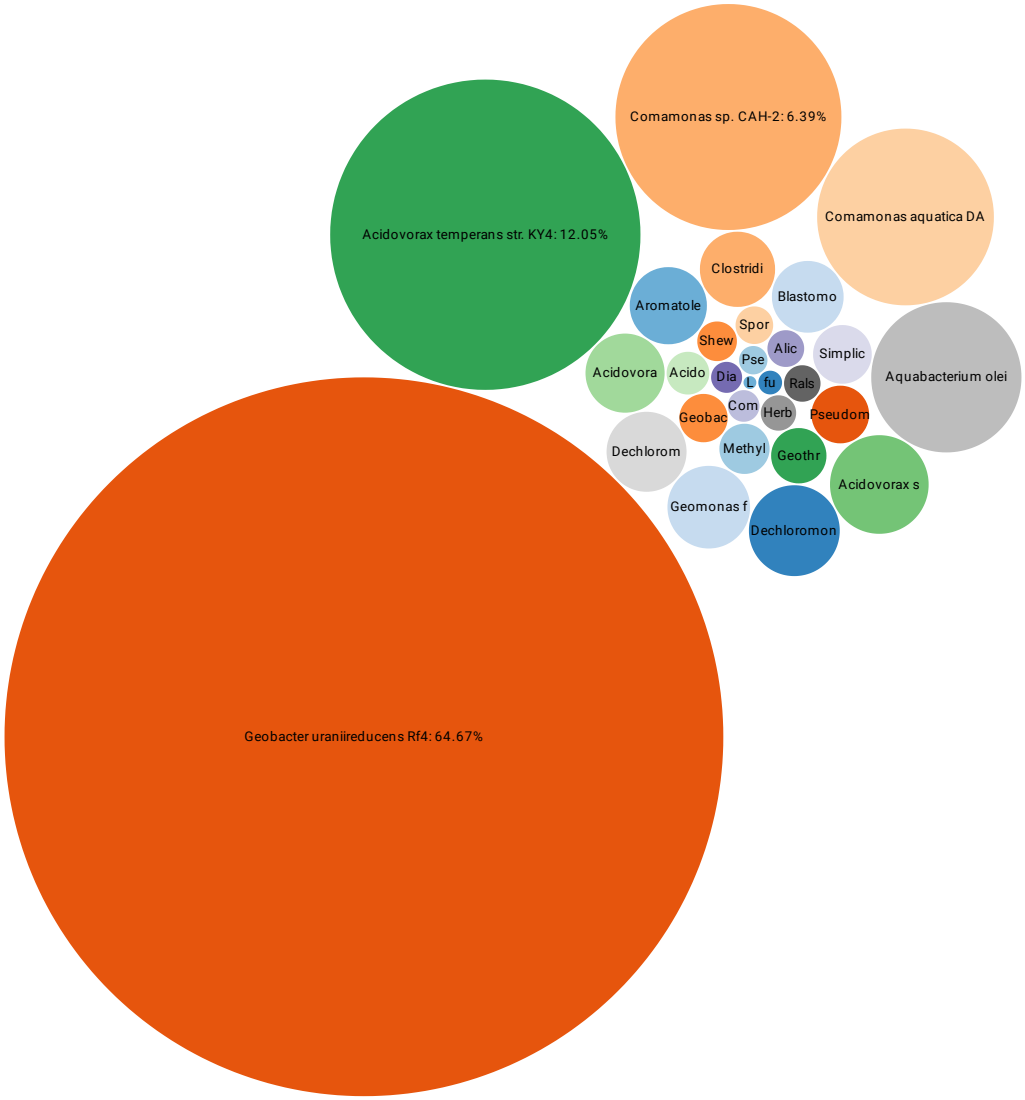

Geobacter uraniireducens Rf4: 64.67%
Geobacter lovleyi SZ: 0.29%
Geomonas ferrireducens str. S62: 0.85%
Acidovorax temperans str. KY4: 12.05%
Acidovorax sp. 93: 1.22%
Acidovorax defluvii str. DSM 12644: 0.78%
Acidovorax soli str. DSM 25157: 0.23%
Comamonas sp. CAH-2: 6.39%
Comamonas aquatica DA1877: 3.91%
Simplicispira lacusdiani str. CPCC 100842: 0.43%
Alicycliphilus denitrificans 25093 Branch: 0.17%
Comamonadaceae bacterium B 24745 Branch: 0.13%
Diaphorobacter sp. J5-51: 0.12%
Aquabacterium olei str. NBRC 110486: 2.82%
Ralstonia sp JGI 24667 Branch: 0.17%
Herbaspirillum 25675 Branch: 0.16%
Dechloromonas hortensis str. MA-1: 1.03%
Dechloromonas sp. CZR5: 0.8%
Aromatoleum tolulyticum str. ATCC 51758: 0.74%
Methyloversatilis discipulorum str. RZ18-153: 0.32%
Blastomonas sp. CCH5-A3: 0.64%
Pseudomonas aeruginosa BWH 38793 Branch: 0.42%
Shewanella sp. POL2: 0.2%
Clostridium magnum DSM 2767: 0.71%
Sporomusa malonica str. DSM 5090: 0.18%
Geothrix fermentans DSM 14018: 0.38%
Pseudoperonospora cubensis isolate MSU-1: 0.1%
fungus2008 1032 3007 Branch: 0.07%
Lentinus polychrous str. BCC7694: 0.02%

Radial Tree Chart



Sunburst Chart



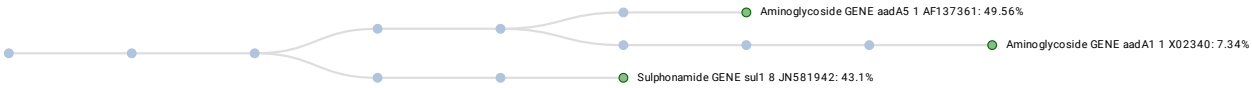

Comamonas sp. CAH-2: 6.39%
Acidovorax temperans str. KY4: 12.05%
Comamonas aquatica DA
Clostridi
Aromatole
Blastomo
Spor
Shew
Alic
Simplic
Pse
Acidovora
Acido
Dia
L
fu
Rals
Aquabacterium olei
Com
Herb
Geobac
Pseudom
Dechlorom
Methyl
Geothr
Acidovorax s
Geomonas f
Dechloromon
Geobacter uraniireducens Rf4: 64.67%

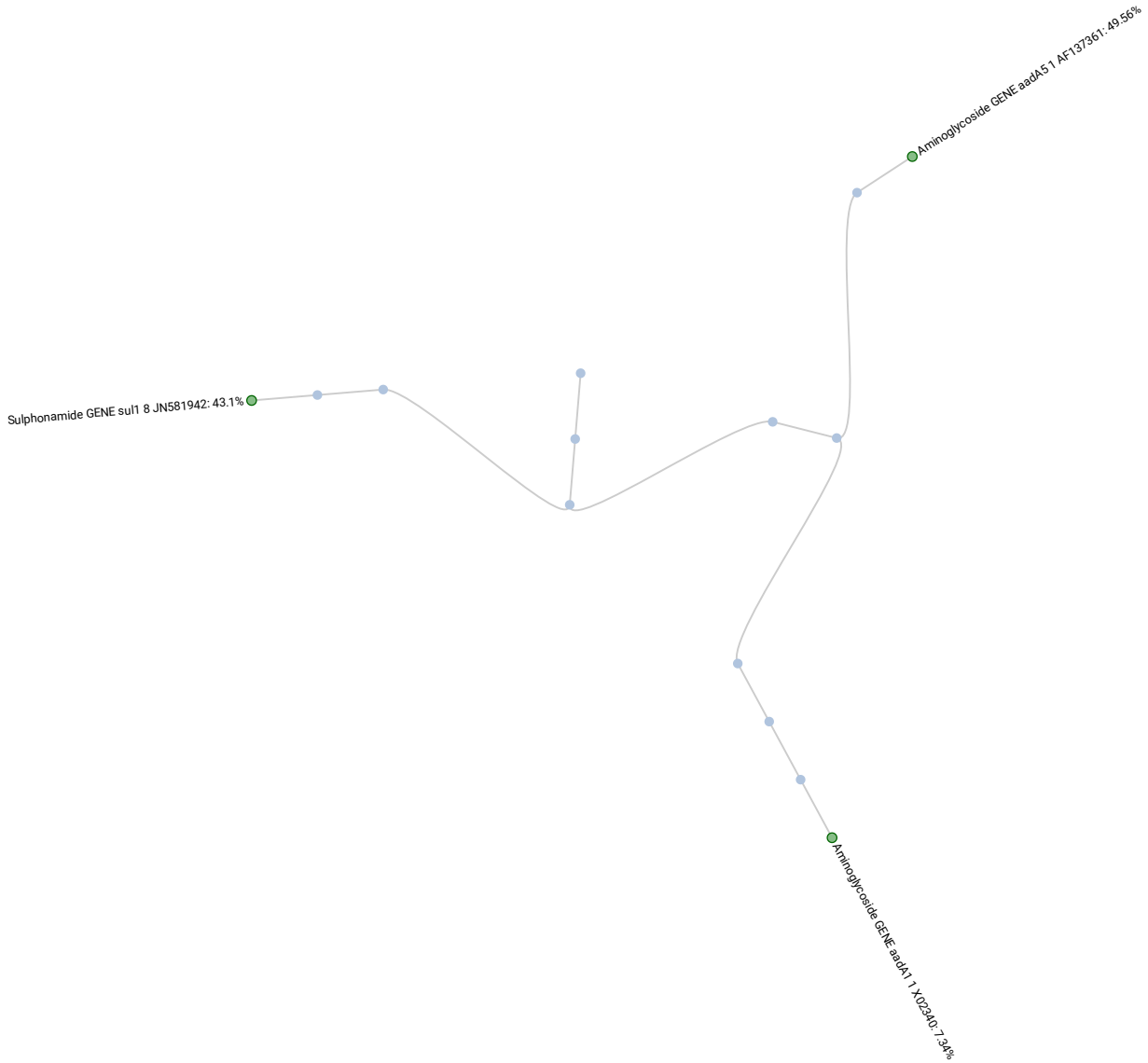
Fasta/q details

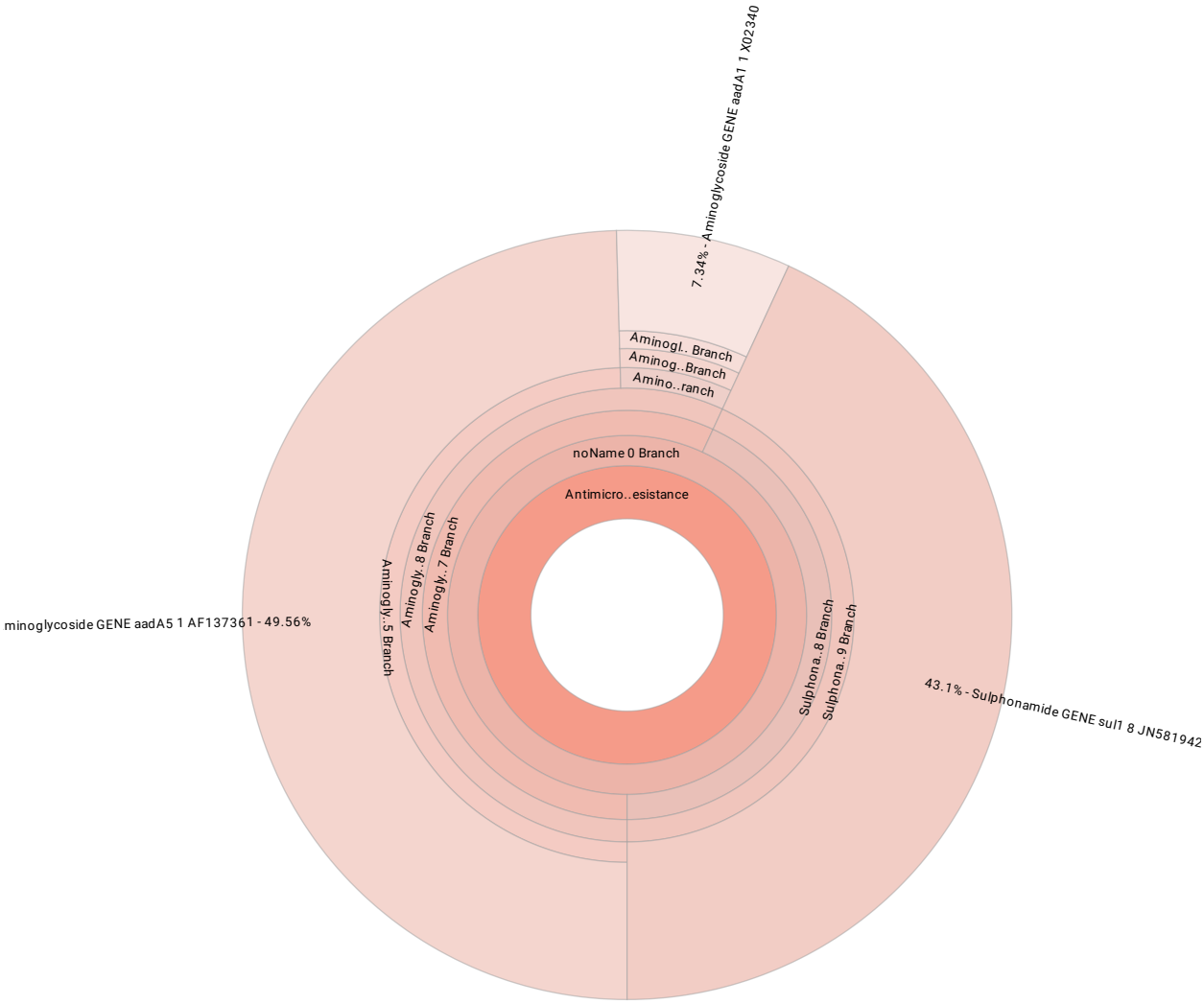
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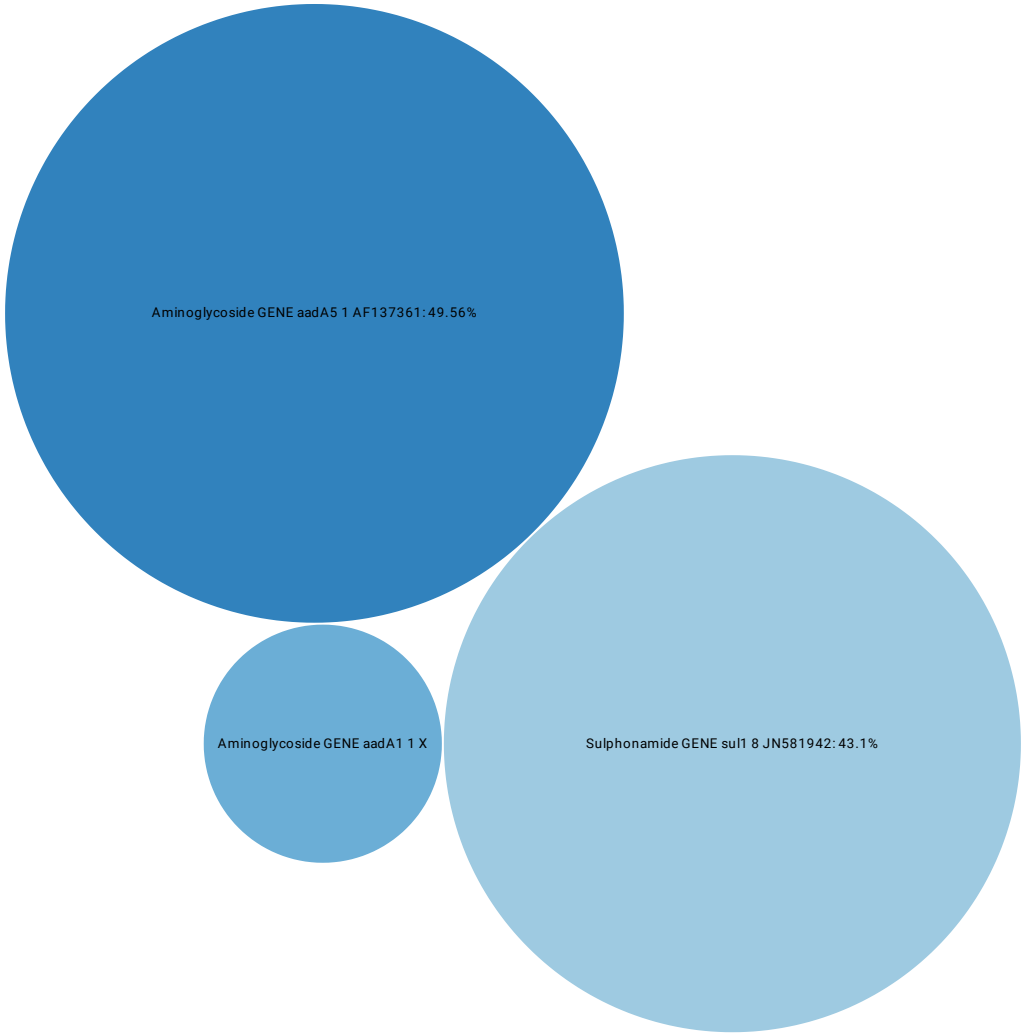
Table

Name	Accession ID	Class	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Aminoglycoside GENE aadA5 1 AF137361	AF137361	Aminoglycoside	5607.21	49.56%	75.94	70.67	472
Sulphonamide GENE sul1 8 JN581942	JN581942	Sulfonamides_Trimethoprim	4877.04	43.10%	100.00	87.23	29
Aminoglycoside GENE aadA1 1 X02340	X02340	Aminoglycoside	830.46	7.34%	35.94	10.36	136


Aminoglycoside GENE aadA5 1 AF137361: 49.56%
Aminoglycoside GENE aadA1 1 X02340: 7.34%
Sulphonamide GENE sul1 8 JN581942: 43.1%


Aminoglycoside GENE aadA5 1 AF137361: 49.56%
Sulphonamide GENE sul1 8 JN581942: 43.1%
Aminoglycoside GENE aadA11 X02340: 7.34%


7.34% - Aminoglycoside GENE aadA1 1 X02340
Aminogl.. Branch
Aminog..Branch
Amino..ranch
noName 0 Branch
Antimicro..esistance
minoglycoside GENE aadA5 1 AF137361 - 49.56%
Aminogly..5 Branch
Aminogly..8 Branch
Aminogly..7 Branch
Sulphona..8 Branch
Sulphona..9 Branch
43.1% - Sulphonamide GENE sul1 8 JN581942


Aminoglycoside GENE aadA5 1 AF137361: 49.56%
Aminoglycoside GENE aadA1 1 X
Sulphonamide GENE sul1 8 JN581942: 43.1%

Fasta/q details

Name	Value
Hit	3138

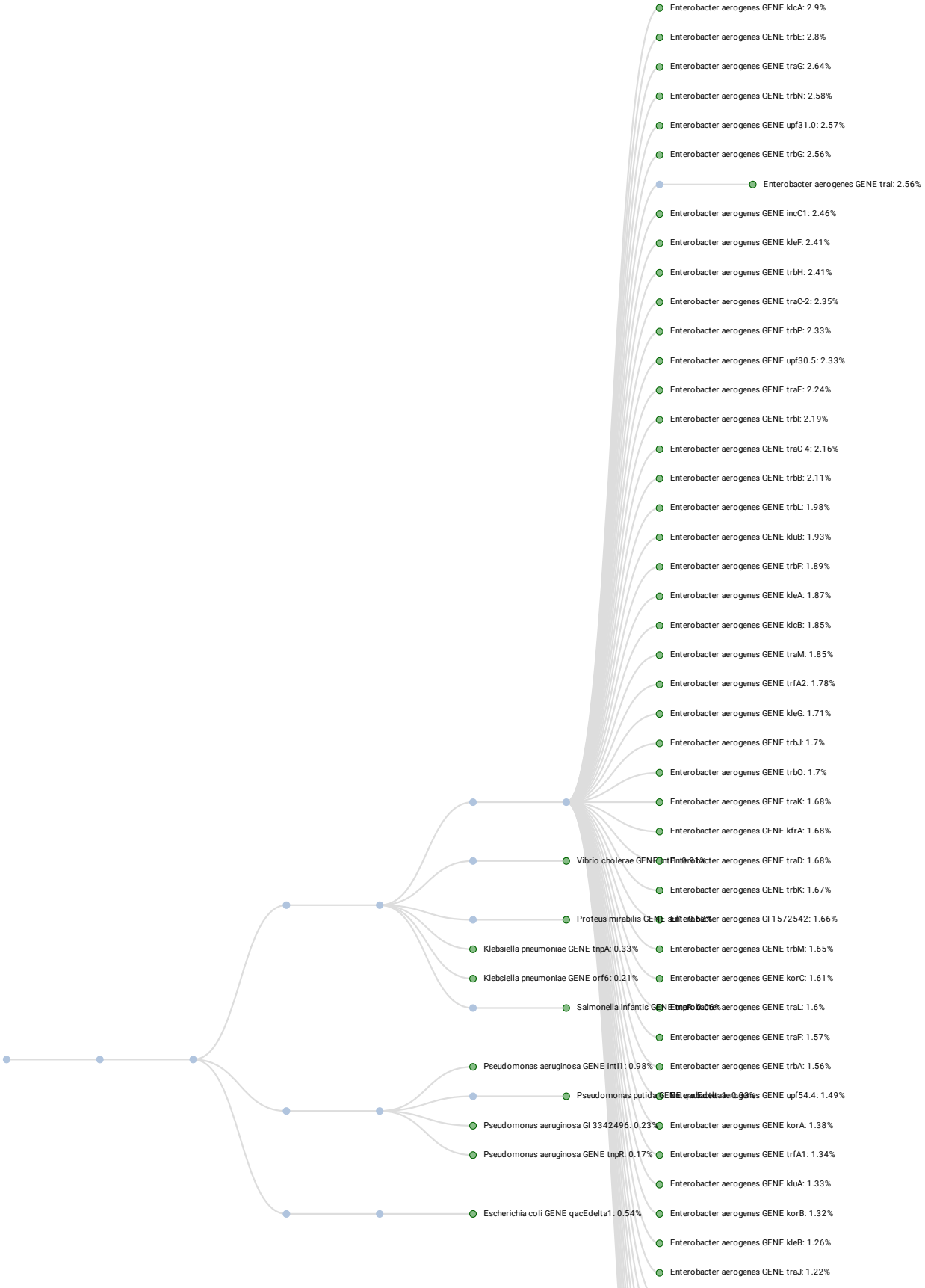
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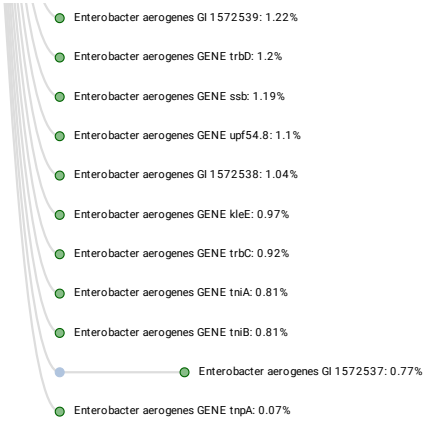
Name	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Enterobacter aerogenes GENE klcA	21519.12	2.90%	100.00	100.00	1333
Enterobacter aerogenes GENE trbE	20739.63	2.80%	94.98	94.98	7312
Enterobacter aerogenes GENE traG	19569.25	2.64%	100.00	100.00	4288
Enterobacter aerogenes GENE trbN	19143.89	2.58%	95.33	95.33	1693
Enterobacter aerogenes GENE upf31.0	19057.99	2.57%	100.00	100.00	1511
Enterobacter aerogenes GENE trbG	18970.68	2.56%	83.63	83.63	2450
Enterobacter aerogenes GENE traI	18957.13	2.56%	100.00	97.88	4826
Enterobacter aerogenes GENE incC1	18273.55	2.46%	100.00	100.00	2231
Enterobacter aerogenes GENE kleF	17910.83	2.41%	100.00	100.00	805
Enterobacter aerogenes GENE trbH	17845.19	2.41%	90.68	90.68	1306
Enterobacter aerogenes GENE traC-2	17422.54	2.35%	100.00	100.00	1615
Enterobacter aerogenes GENE trbP	17315.4	2.33%	97.01	97.01	1895
Enterobacter aerogenes GENE upf30.5	17305.5	2.33%	95.33	95.33	1145
Enterobacter aerogenes GENE traE	16642.54	2.24%	88.25	88.25	4522
Enterobacter aerogenes GENE trbI	16246.93	2.19%	92.65	92.65	3178
Enterobacter aerogenes GENE traC-4	16000.84	2.16%	100.00	100.00	3266
Enterobacter aerogenes GENE trbB	15616.62	2.11%	91.19	91.19	2337

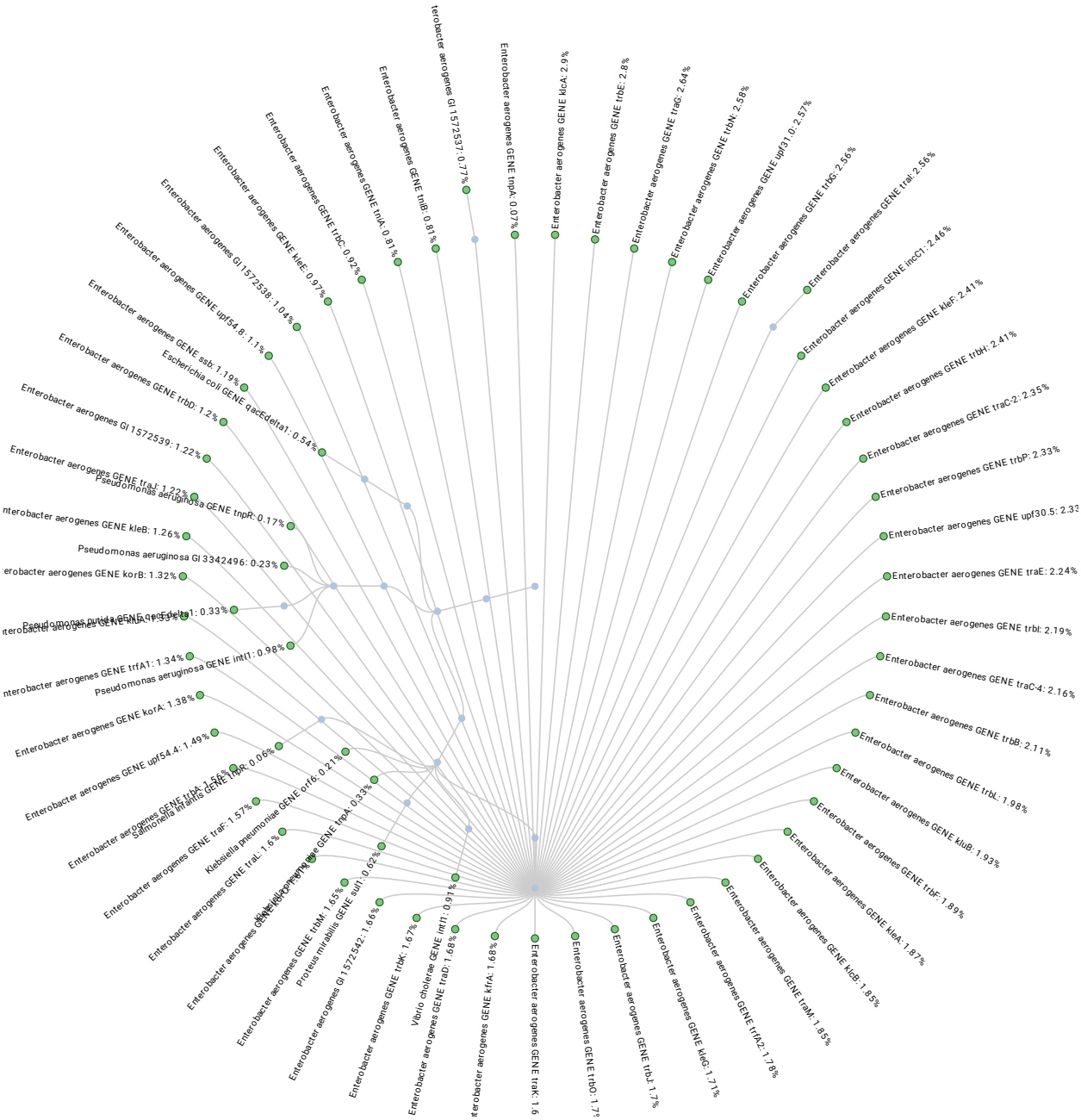
Name	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Enterobacter aerogenes GENE trbL	14662.7	1.98%	97.70	97.70	2371
Enterobacter aerogenes GENE kluB	14317.42	1.93%	100.00	100.00	739
Enterobacter aerogenes GENE trbF	14039.66	1.89%	95.60	95.60	1352
Enterobacter aerogenes GENE kleA	13858.58	1.87%	100.00	100.00	533
Enterobacter aerogenes GENE klcB	13749.8	1.85%	96.85	96.85	1866
Enterobacter aerogenes GENE traM	13706.84	1.85%	100.00	100.00	700
Enterobacter aerogenes GENE trfA2	13190.64	1.78%	76.88	76.88	1326
Enterobacter aerogenes GENE kleG	12702.59	1.71%	100.00	100.00	504
Enterobacter aerogenes GENE trbJ	12612.55	1.70%	84.33	84.33	1441
Enterobacter aerogenes GENE trbO	12588.09	1.70%	100.00	100.00	605
Enterobacter aerogenes GENE traK	12493.25	1.68%	100.00	100.00	672
Enterobacter aerogenes GENE kfrA	12482	1.68%	97.42	97.42	1382
Enterobacter aerogenes GENE traD	12432.68	1.68%	100.00	100.00	601
Enterobacter aerogenes GENE trbK	12380.69	1.67%	81.97	81.97	526
Enterobacter aerogenes GI 1572542	12300.56	1.66%	82.97	82.97	1702
Enterobacter aerogenes GENE trbM	12269.44	1.65%	100.00	100.00	822
Enterobacter aerogenes GENE korC	11951.64	1.61%	96.97	96.97	497
Enterobacter aerogenes GENE traL	11896.72	1.60%	94.57	94.57	1263
Enterobacter aerogenes GENE traF	11640.27	1.57%	100.00	100.00	912
Enterobacter aerogenes GENE trbA	11545.49	1.56%	100.00	100.00	648
Enterobacter aerogenes GENE upf54.4	11042.34	1.49%	90.00	90.00	827

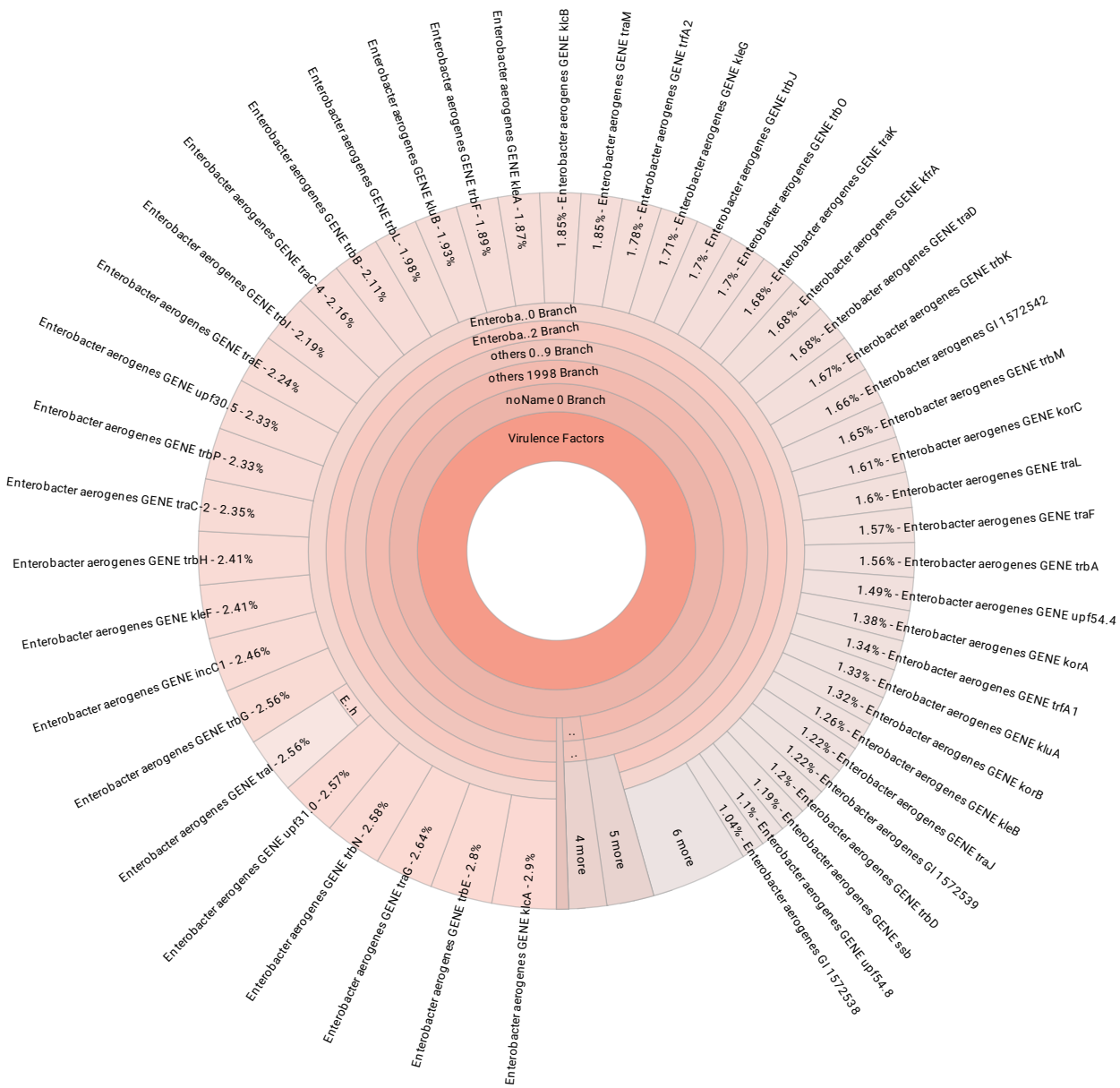
Name	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Enterobacter aerogenes GENE korA	10208.11	1.38%	100.00	100.00	488
Enterobacter aerogenes GENE trfA1	9942.22	1.34%	91.67	91.67	482
Enterobacter aerogenes GENE kluA	9844.51	1.33%	100.00	100.00	432
Enterobacter aerogenes GENE korB	9766.64	1.32%	87.50	87.50	1140
Enterobacter aerogenes GENE kleB	9334.49	1.26%	100.00	100.00	337
Enterobacter aerogenes GENE traJ	9055.09	1.22%	100.00	100.00	455
Enterobacter aerogenes GI 1572539	9034.16	1.22%	100.00	100.00	159
Enterobacter aerogenes GENE trbD	8891.82	1.20%	88.46	88.46	400
Enterobacter aerogenes GENE ssb	8843.4	1.19%	100.00	100.00	423
Enterobacter aerogenes GENE upf54.8	8166.37	1.10%	100.00	100.00	360
Enterobacter aerogenes GI 1572538	7721.46	1.04%	100.00	100.00	114
Pseudomonas aeruginosa GENE intI1	7301.06	0.98%	100.00	100.00	197
Enterobacter aerogenes GENE kleE	7217.42	0.97%	93.75	93.75	242
Enterobacter aerogenes GENE trbC	6842.9	0.92%	69.79	69.79	378
Vibrio cholerae GENE intI1	6756.19	0.91%	100.00	100.00	75
Enterobacter aerogenes GENE tniA	6014.4	0.81%	75.50	75.50	792
Enterobacter aerogenes GENE tniB	6009.65	0.81%	86.07	86.07	387
Enterobacter aerogenes GI 1572537	5678.57	0.77%	100.00	100.00	54
Proteus mirabilis GENE sul1	4577.28	0.62%	77.27	77.27	136
Escherichia coli GENE qacEdelta1	4017.68	0.54%	100.00	100.00	44
Klebsiella pneumoniae GENE tnpA	2415.86	0.33%	47.39	47.39	123
Pseudomonas putida GENE qacEdelta1	2414.46	0.33%	100.00	100.00	12

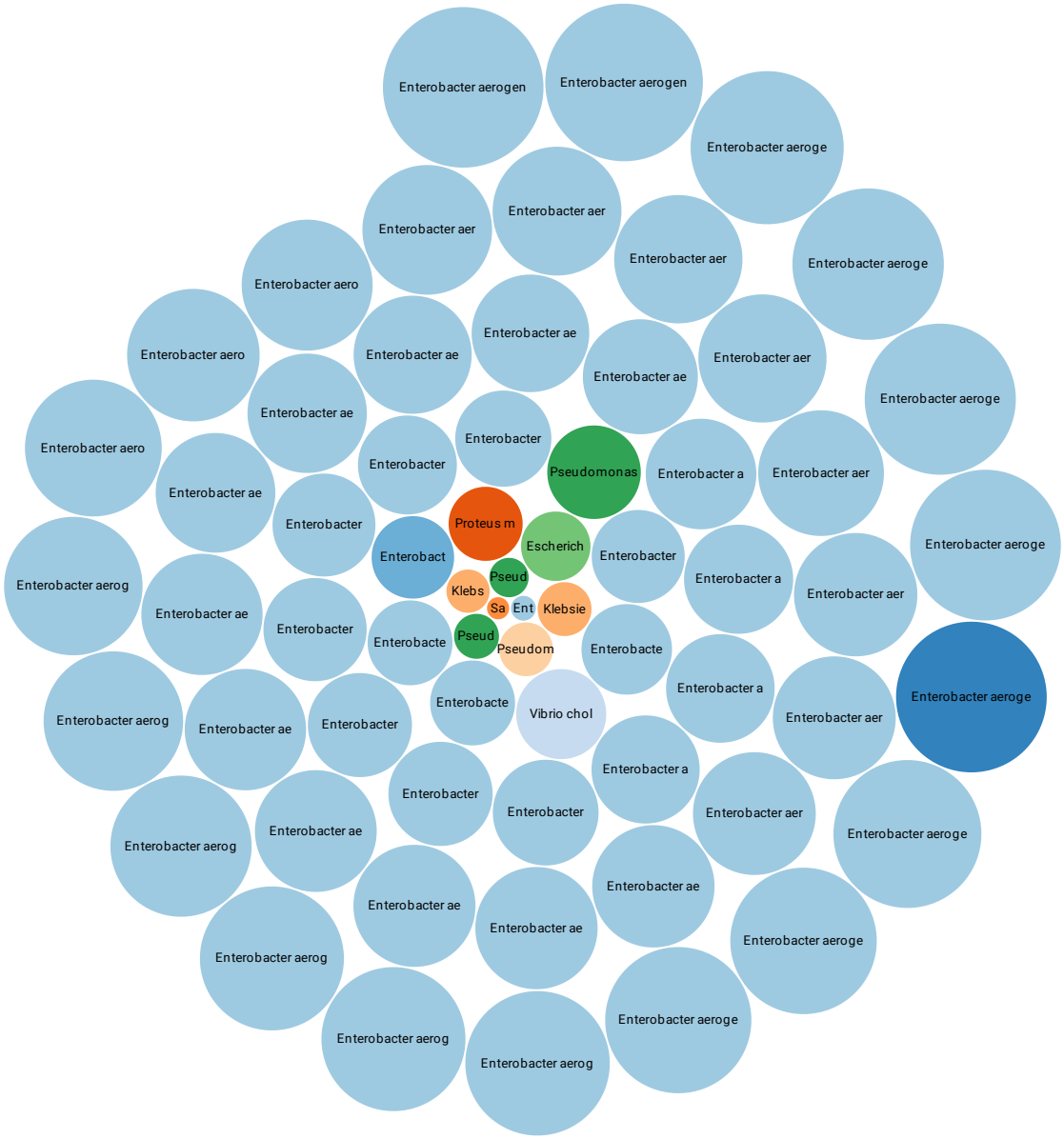
Name	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Pseudomonas aeruginosa GI 3342496	1681.47	0.23%	35.37	35.37	92
Klebsiella pneumoniae GENE orf6	1557.58	0.21%	44.26	44.26	27
Pseudomonas aeruginosa GENE tnpR	1288.46	0.17%	13.08	13.08	326
Enterobacter aerogenes GENE tnpA	508.94	0.07%	11.79	11.79	113
Salmonella Infantis GENE tnpR	408.45	0.06%	11.00	11.00	27


Enterobacter aerogenes GENE klcA: 2.9%
Enterobacter aerogenes GENE trbE: 2.8%
Enterobacter aerogenes GENE traG: 2.64%
Enterobacter aerogenes GENE trbN: 2.58%
Enterobacter aerogenes GENE upf31.0: 2.57%
Enterobacter aerogenes GENE trbG: 2.56%
Enterobacter aerogenes GENE traI: 2.56%
Enterobacter aerogenes GENE incC1: 2.46%
Enterobacter aerogenes GENE kleF: 2.41%
Enterobacter aerogenes GENE trbH: 2.41%
Enterobacter aerogenes GENE traC-2: 2.35%
Enterobacter aerogenes GENE trbP: 2.33%
Enterobacter aerogenes GENE upf30.5: 2.33%
Enterobacter aerogenes GENE traE: 2.24%
Enterobacter aerogenes GENE trbI: 2.19%
Enterobacter aerogenes GENE traC-4: 2.16%
Enterobacter aerogenes GENE trbB: 2.11%
Enterobacter aerogenes GENE trbL: 1.98%
Enterobacter aerogenes GENE kluB: 1.93%
Enterobacter aerogenes GENE trbF: 1.89%
Enterobacter aerogenes GENE kleA: 1.87%
Enterobacter aerogenes GENE klcB: 1.85%
Enterobacter aerogenes GENE traM: 1.85%
Enterobacter aerogenes GENE trfA2: 1.78%
Enterobacter aerogenes GENE kleG: 1.71%
Enterobacter aerogenes GENE trbJ: 1.7%
Enterobacter aerogenes GENE trbO: 1.7%
Enterobacter aerogenes GENE traK: 1.68%
Enterobacter aerogenes GENE kfrA: 1.68%
Vibrio cholerae GENE
Enterobacter aerogenes GENE traD: 1.68%
Enterobacter aerogenes GENE trbK: 1.67%
Proteus mirabilis GENE
Enterobacter aerogenes GI 1572542: 1.66%
Klebsiella pneumoniae GENE tnpA: 0.33%
Enterobacter aerogenes GENE trbM: 1.65%
Klebsiella pneumoniae GENE orf6: 0.21%
Enterobacter aerogenes GENE korC: 1.61%
Salmonella Infantis GENE
Enterobacter aerogenes GENE traL: 1.6%
Enterobacter aerogenes GENE traF: 1.57%
Pseudomonas aeruginosa GENE intI1: 0.98%
Enterobacter aerogenes GENE trbA: 1.56%
Pseudomonas putida GENE
Enterobacter aerogenes GENE upf54.4: 1.49%
Pseudomonas aeruginosa GI 3342496: 0.23%
Enterobacter aerogenes GENE korA: 1.38%
Pseudomonas aeruginosa GENE tnpR: 0.17%
Enterobacter aerogenes GENE trfA1: 1.34%
Enterobacter aerogenes GENE kluA: 1.33%
Escherichia coli GENE qacEdelta1: 0.54%
Enterobacter aerogenes GENE korB: 1.32%
Enterobacter aerogenes GENE kleB: 1.26%
Enterobacter aerogenes GENE traJ: 1.22%


Enterobacter aerogenes GI 1572539: 1.22%
Enterobacter aerogenes GENE trbD: 1.2%
Enterobacter aerogenes GENE ssb: 1.19%
Enterobacter aerogenes GENE upf54.8: 1.1%
Enterobacter aerogenes GI 1572538: 1.04%
Enterobacter aerogenes GENE kleE: 0.97%
Enterobacter aerogenes GENE trbC: 0.92%
Enterobacter aerogenes GENE tniA: 0.81%
Enterobacter aerogenes GENE tniB: 0.81%
Enterobacter aerogenes GI 1572537: 0.77%
Enterobacter aerogenes GENE tnpA: 0.07%


terobacter aerogenes GI 1572537: 0.77%
Enterobacter aerogenes GENE klcA: 2.9%
Enterobacter aerogenes GENE trbE: 2.8%
Enterobacter aerogenes GENE traG: 2.64%
Enterobacter aerogenes GENE trbN: 2.58%
Enterobacter aerogenes GENE upf31.0: 2.57%
Enterobacter aerogenes GENE trbG: 2.56%
Enterobacter aerogenes GENE trat: 2.56%
Enterobacter aerogenes GENE incC1: 2.46%
Enterobacter aerogenes GENE klcF: 2.41%
Enterobacter aerogenes GENE trbH: 2.41%
Enterobacter aerogenes GENE traC-2: 2.35%
Enterobacter aerogenes GENE trbP: 2.33%
Enterobacter aerogenes GENE upf30.5: 2.33
Enterobacter aerogenes GENE traE: 2.24%
Enterobacter aerogenes GENE trbI: 2.19%
Enterobacter aerogenes GENE traC-4: 2.16%
Enterobacter aerogenes GENE trbB: 2.11%
Enterobacter aerogenes GENE trbL: 1.98%
Enterobacter aerogenes GENE kluB: 1.93%
Enterobacter aerogenes GENE trbF: 1.89%
Enterobacter aerogenes GENE klcA: 1.87%
Enterobacter aerogenes GENE klcB: 1.85%
Enterobacter aerogenes GENE traM: 1.85%
Enterobacter aerogenes GENE trfA2: 1.78%
Enterobacter aerogenes GENE klcG: 1.71%
Enterobacter aerogenes GENE trbJ: 1.7%
Enterobacter aerogenes GENE trbO: 1.7%
terobacter aerogenes GENE traK: 1.6
Enterobacter aerogenes GENE klfA: 1.68%
Enterobacter aerogenes GENE traD: 1.68%
Vibrio cholerae GENE intI1: 0.91%
Enterobacter aerogenes GENE trbK: 1.67%
Enterobacter aerogenes GENE trbM: 1.65%
Proteus mirabilis GENE sul1: 0.62%
Enterobacter aerogenes GI 1572542: 1.66%
Klebsiella pneumoniae GENE tnpA: 0.33%
Enterobacter aerogenes GENE orf6: 0.21%
Salmonella infantis GENE tnpR: 0.06%
Enterobacter aerogenes GENE traF: 1.57%
Enterobacter aerogenes GENE upf54.4: 1.49%
Enterobacter aerogenes GENE korA: 1.38%
Pseudomonas aeruginosa GENE intI1: 0.98%
nterobacter aerogenes GENE trfA1: 1.34%
Pseudomonas aeruginosa GI 3342496: 0.23%
erobacter aerogenes GENE korB: 1.32%
nterobacter aerogenes GENE kleB: 1.26%
Pseudomonas aeruginosa GENE tnpR: 0.17%
Enterobacter aerogenes GENE traJ: 1.22%
Enterobacter aerogenes GI 1572539: 1.22%
Enterobacter aerogenes GENE trbD: 1.2%
Escherichia coli GENE qacEdelta1: 0.54%
Enterobacter aerogenes GENE ssb: 1.19%
Enterobacter aerogenes GENE upf54.8: 1.1%
Enterobacter aerogenes GI 1572538: 1.04%
Enterobacter aerogenes GENE klcE: 0.97%
Enterobacter aerogenes GENE trhC: 0.92%
Enterobacter aerogenes GENE tniA: 0.81%
Enterobacter aerogenes GENE tniB: 0.81%
Enterobacter aerogenes GENE tnpA: 0.07%


Virulence Factors
noName 0 Branch
others 1998 Branch
others 0..9 Branch
Enteroba..2 Branch
Enteroba..0 Branch
Enterobacter aerogenes GENE klcA - 2.9%
Enterobacter aerogenes GENE trbE - 2.8%
Enterobacter aerogenes GENE traG - 2.64%
Enterobacter aerogenes GENE trbN - 2.58%
Enterobacter aerogenes GENE upf31.0 - 2.57%
Enterobacter aerogenes GENE traI - 2.56%
Enterobacter aerogenes GENE trbG - 2.56%
Enterobacter aerogenes GENE incC1 - 2.46%
Enterobacter aerogenes GENE kleF - 2.41%
Enterobacter aerogenes GENE trbH - 2.41%
Enterobacter aerogenes GENE traC-2 - 2.35%
Enterobacter aerogenes GENE trbP - 2.33%
Enterobacter aerogenes GENE upf30.5 - 2.33%
Enterobacter aerogenes GENE traE - 2.24%
Enterobacter aerogenes GENE trbI - 2.19%
Enterobacter aerogenes GENE traC-4 - 2.16%
Enterobacter aerogenes GENE trbB - 2.11%
Enterobacter aerogenes GENE trbL - 1.98%
Enterobacter aerogenes GENE kluB - 1.93%
Enterobacter aerogenes GENE trbF - 1.89%
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1.85% - Enterobacter aerogenes GENE klcB
1.85% - Enterobacter aerogenes GENE traM
1.78% - Enterobacter aerogenes GENE trfA2
1.71% - Enterobacter aerogenes GENE kleG
1.7% - Enterobacter aerogenes GENE trbJ
1.68% - Enterobacter aerogenes GENE trbO
1.68% - Enterobacter aerogenes GENE traK
1.68% - Enterobacter aerogenes GENE kfrA
1.67% - Enterobacter aerogenes GENE traD
1.66% - Enterobacter aerogenes GENE trbK
1.65% - Enterobacter aerogenes GI 1572542
1.61% - Enterobacter aerogenes GENE trbM
1.6% - Enterobacter aerogenes GENE korC
1.57% - Enterobacter aerogenes GENE traL
1.56% - Enterobacter aerogenes GENE traF
1.49% - Enterobacter aerogenes GENE trbA
1.38% - Enterobacter aerogenes GENE upf54.4
1.34% - Enterobacter aerogenes GENE korA
1.33% - Enterobacter aerogenes GENE trfA1
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1.2% - Enterobacter aerogenes GENE traJ
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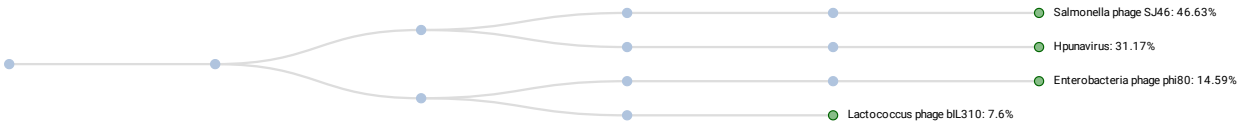

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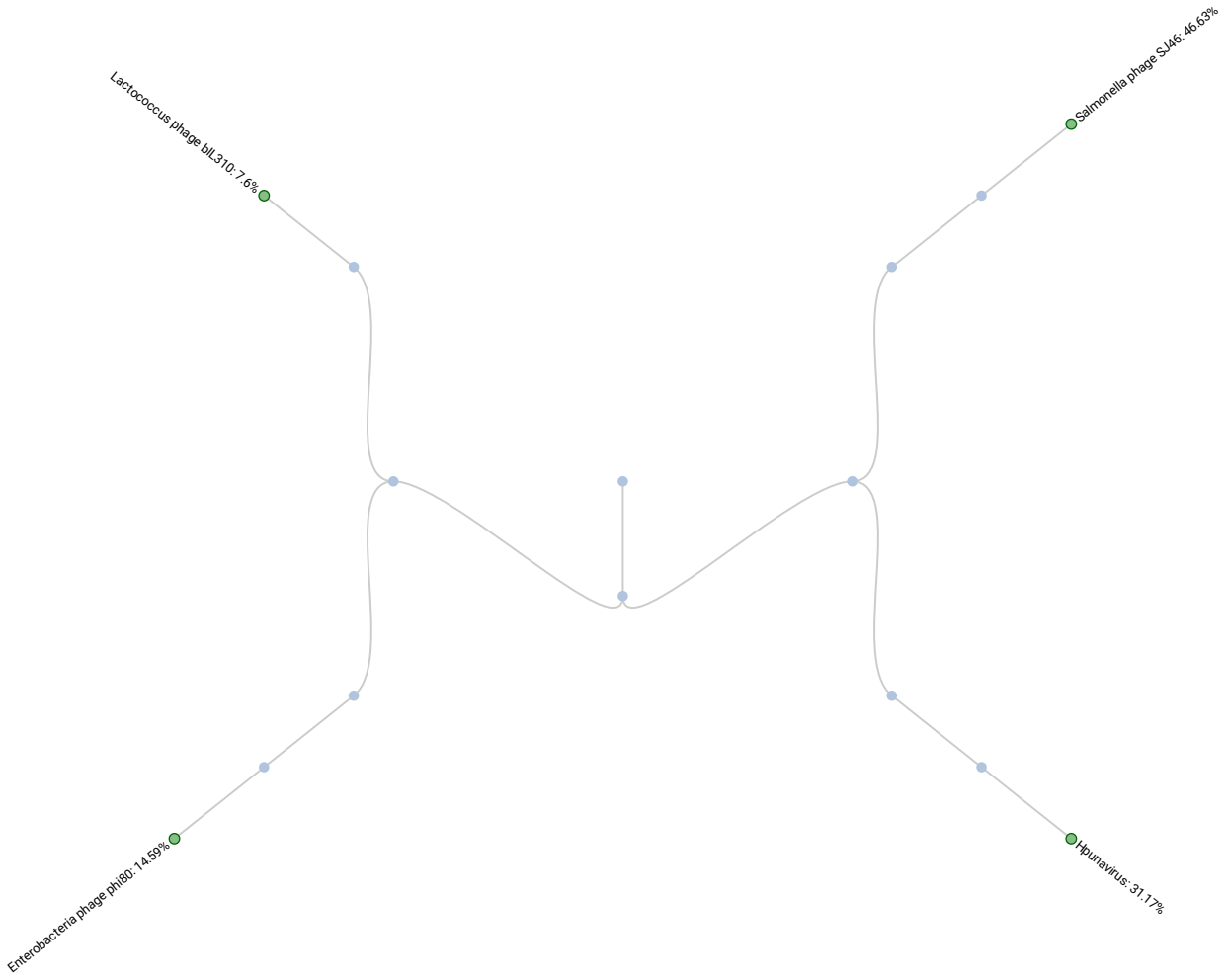
Fasta/q details

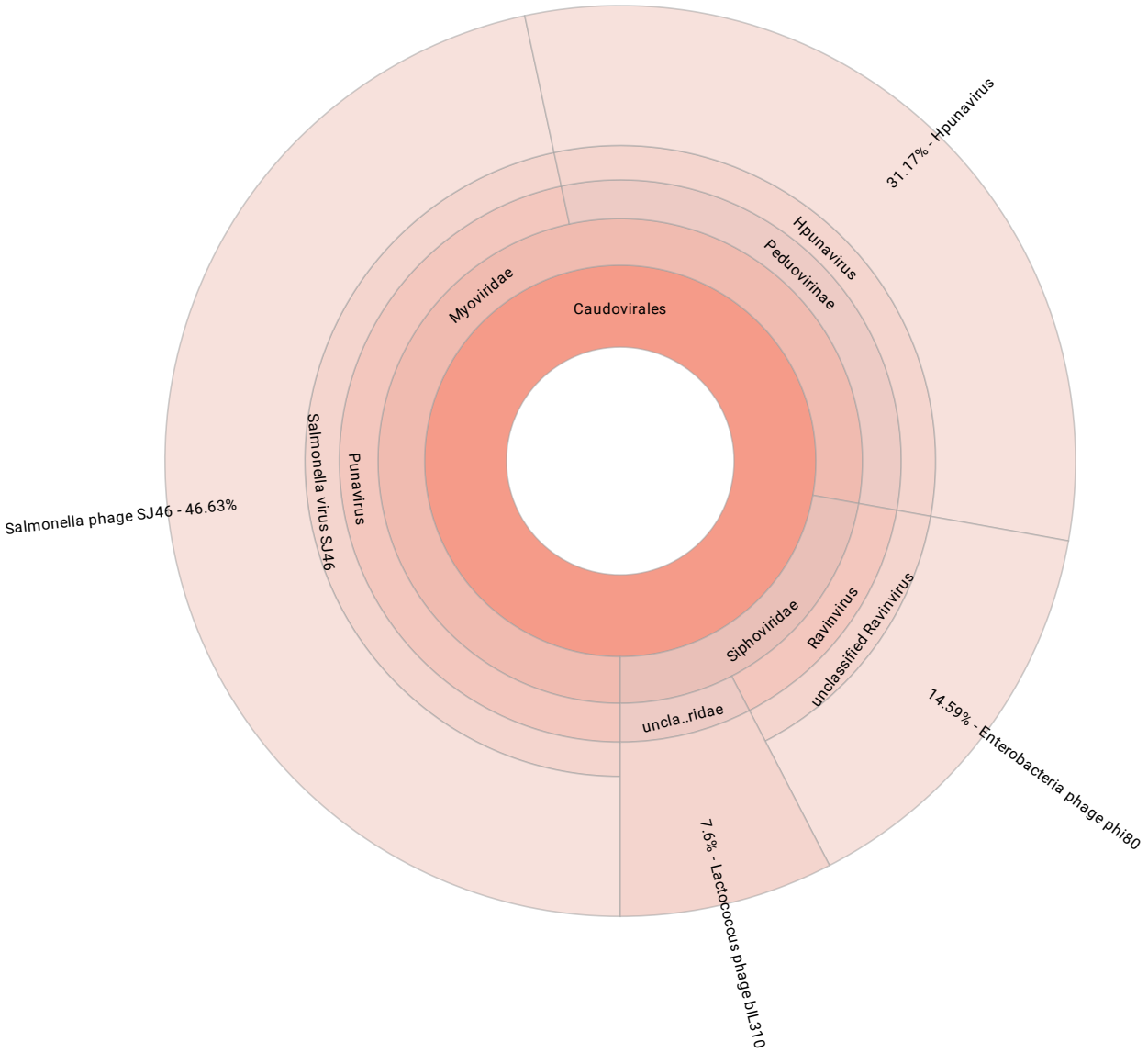
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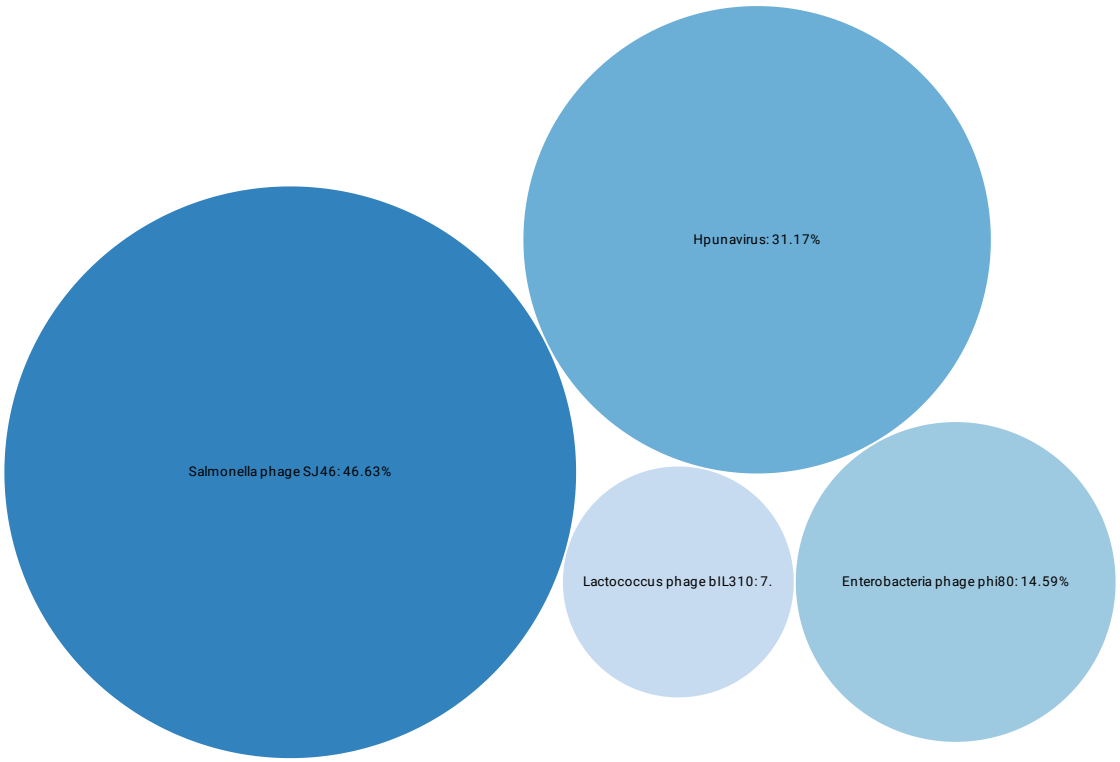
Table

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Salmonella phage SJ46	1815968	16.68	46.63%	0.36	0.20	157
Hpunavirus	1196844	11.15	31.17%	0.14	0.14	78
Enterobacteria phage phi80	10713	5.22	14.59%	0.16	0.24	47
Lactococcus phage bIL310	151538	2.72	7.60%	0.11	0.11	9


Salmonella phage SJ46: 46.63%
Hpunavirus: 31.17%
Enterobacteria phage phi80: 14.59%
Lactococcus phage bIL310: 7.6%


Lactococcus phage bIL310: 7.6%
Salmonella phage SJ46: 46.63%
Enterobacteria phage phi80: 14.59%
Hpunavirus: 31.17%


Caudovirales
Myoviridae
Salmonella virus SJ46
Punavirus
Salmonella phage SJ46 - 46.63%
Peduovirinae
Hpunavirus
31.17% - Hpunavirus
Siphoviridae
Ravinvirus
unclassified Ravinvirus
14.59% - Enterobacteria phage phi80
uncla..ridae
7.6% - Lactococcus phage bIL310


Hpunavirus: 31.17%
Salmonella phage SJ46: 46.63%
Lactococcus phage bIL310: 7.
Enterobacteria phage phi80: 14.59%

Fasta/q details

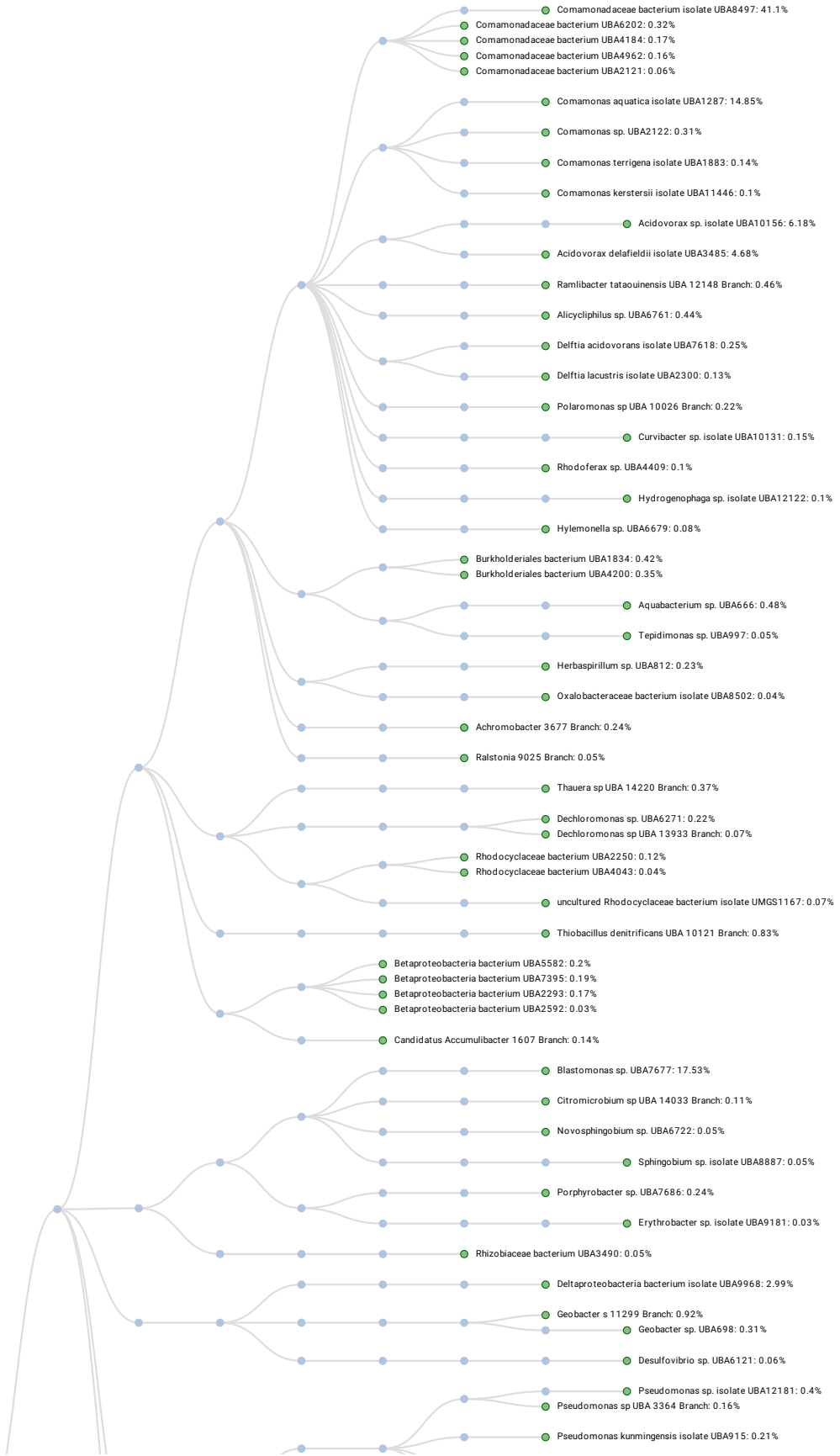
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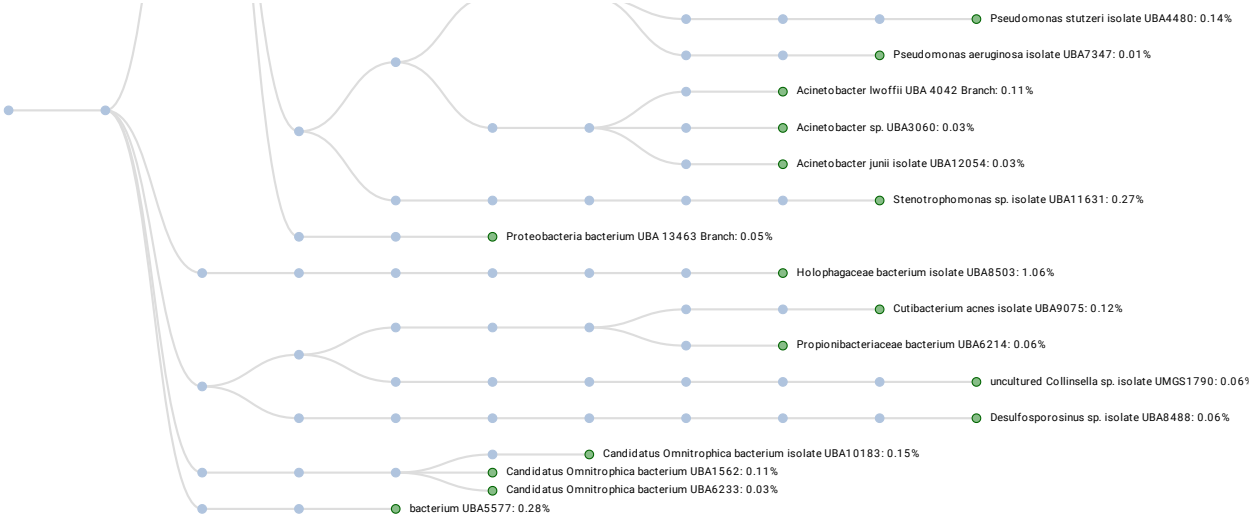
Table

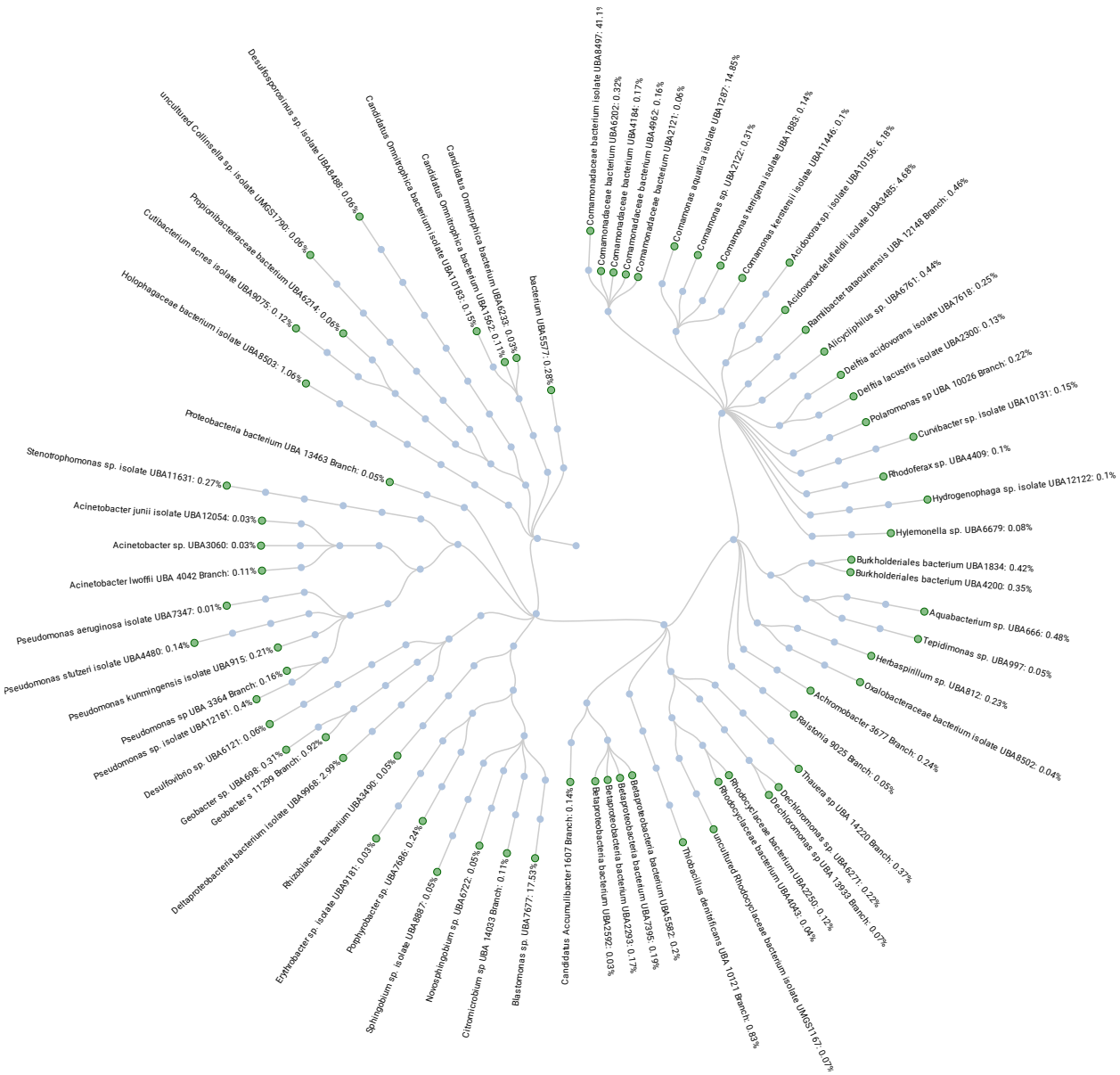
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Comamonadaceae bacterium	1871071	7359.25	41.10%	36.23	44.00	140157
Blastomonas sp. UBA7677	1946117	3139.6	17.53%	27.88	27.88	26447
Comamonas aquatica	225991	2658.63	14.85%	22.39	22.46	32573
Acidovorax sp.	1872122	1106.94	6.18%	9.52	9.77	23494
Acidovorax delafieldii	47920	838.36	4.68%	4.71	5.03	28626
Deltaproteobacteria bacterium	2026735	535.45	2.99%	5.94	5.94	4796
Holophagaceae bacterium	2052165	188.92	1.06%	2.02	2.03	2626
Geobacter	28231	165.12	0.92%	0.14	0.14	403
Thiobacillus denitrificans	36861	148.15	0.83%	4.55	4.55	11
Aquabacterium sp. UBA666	1946043	85.65	0.48%	1.26	1.13	1689
Ramlibacter tataouinensis	94132	83.04	0.46%	0.35	0.35	2173
Alicycliphilus sp. UBA6761	1946004	78.57	0.44%	0.79	0.66	659
Burkholderiales bacterium UBA1834	1950768	75.1	0.42%	0.61	0.40	1049
Pseudomonas sp.	306	72.11	0.40%	1.16	1.11	354
unclassified Thauera	2609274	66.68	0.37%	3.28	3.28	2
Burkholderiales bacterium UBA4200	1950777	62.53	0.35%	0.74	0.37	274
Comamonadaceae bacterium UBA6202	1951611	56.73	0.32%	0.83	0.82	3266
Comamonas sp. UBA2122	1946390	55.37	0.31%	0.72	1.16	741
Geobacter sp. UBA698	1961402	54.95	0.31%	0.19	0.19	2961
bacterium UBA5577	1947808	50.28	0.28%	0.54	0.54	741
Stenotrophomonas sp.	69392	49.04	0.27%	1.02	0.57	679
Delftia acidovorans	80866	43.94	0.25%	1.27	0.90	463
Achromobacter	222	43.09	0.24%	2.20	2.20	3
Porphyrobacter sp. UBA7686	1947080	42.4	0.24%	0.54	0.54	787
Herbaspirillum sp. UBA812	1946590	40.86	0.23%	0.54	0.54	1049

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Dechloromonas sp. UBA6271	1946404	39.19	0.22%	0.52	0.54	900
unclassified Polaromonas	2638319	38.9	0.22%	0.27	0.27	19
Pseudomonas kunmingensis	1211807	38.38	0.21%	0.44	0.23	129
Betaproteobacteria bacterium UBA5582	1948460	35.28	0.20%	0.41	0.52	967
Betaproteobacteria bacterium UBA7395	1948463	33.57	0.19%	0.46	0.58	606
Comamonadaceae bacterium UBA4184	1951606	29.65	0.17%	0.46	0.39	3420
Betaproteobacteria bacterium UBA2293	1948454	29.48	0.17%	0.38	0.40	919
Comamonadaceae bacterium UBA4962	1951608	28.58	0.16%	0.30	0.31	1267
unclassified Pseudomonas	2583993	28.73	0.16%	0.12	0.12	165
Candidatus Omnitrophica bacterium	2035772	27.06	0.15%	0.51	0.53	137
Curvibacter sp.	1888168	26.82	0.15%	0.26	0.27	1056
Comamonas terrigena	32013	25.37	0.14%	0.33	0.47	623
Pseudomonas stutzeri	316	25.45	0.14%	0.52	0.48	67
Candidatus Accumulibacter	327159	24.96	0.14%	0.46	0.46	7
Delftia lacustris	558537	23.93	0.13%	0.33	0.57	567
Cutibacterium acnes	1747	21.53	0.12%	0.64	0.74	23
Rhodocyclaceae bacterium UBA2250	1952837	20.81	0.12%	0.29	0.65	517
unclassified Citromicrobium	2630544	20.62	0.11%	0.64	0.64	11
Acinetobacter lwoffii	28090	20.31	0.11%	0.54	0.42	20
Candidatus Omnitrophica bacterium UBA1562	1953262	19.24	0.11%	0.36	0.36	117
Rhodoferax sp. UBA4409	1947378	18.55	0.10%	0.20	0.20	670
Hydrogenophaga sp.	1904254	18.05	0.10%	0.28	0.20	92
Comamonas kerstersii	225992	17.3	0.10%	0.22	0.25	469
Hylemonella sp. UBA6679	1946611	14.86	0.08%	0.13	0.13	589
unclassified Dechloromonas	2633351	13.1	0.07%	0.19	0.18	126
uncultured Rhodocyclaceae bacterium	151985	12.16	0.07%	0.18	0.19	326
Propionibacteriaceae bacterium UBA6214	1952963	11.38	0.06%	0.20	0.20	201
Comamonadaceae bacterium UBA2121	1951599	10.99	0.06%	0.11	0.13	586

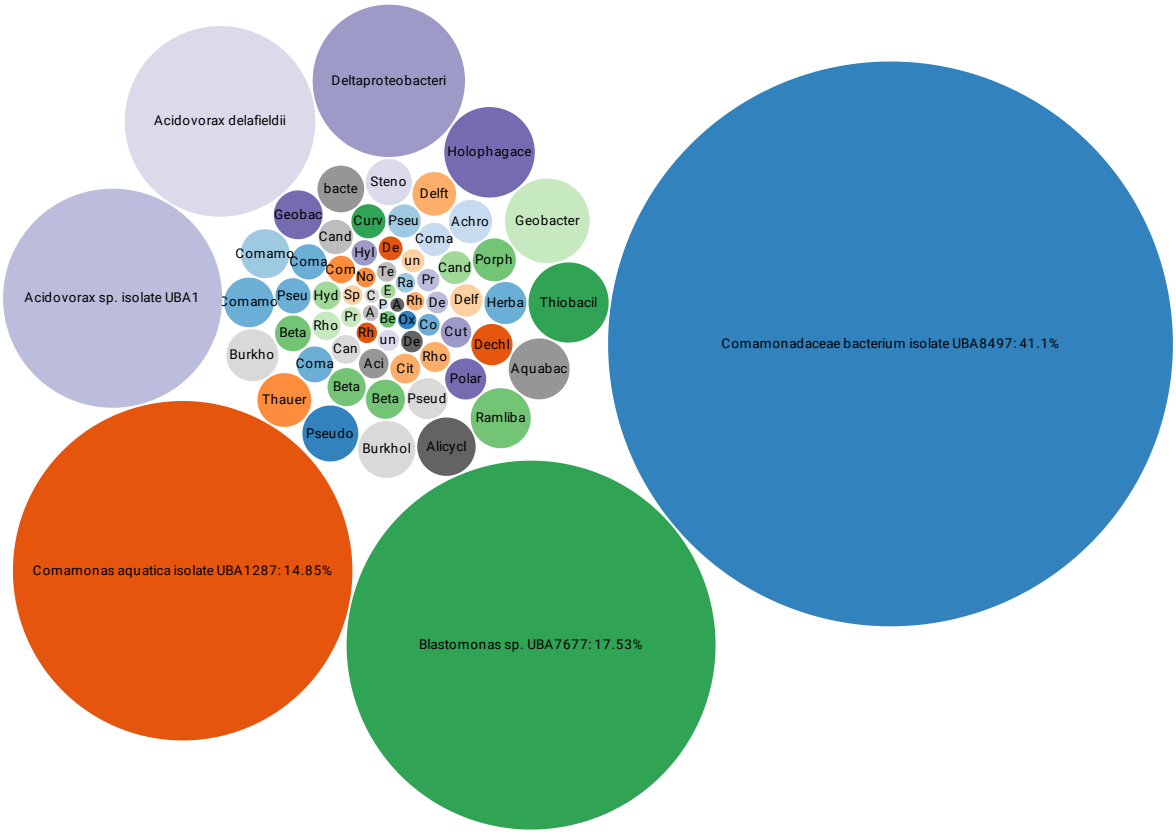
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Desulfovibrio sp. UBA6121	1961409	10.95	0.06%	0.19	0.19	214
Desulfosporosinus sp.	157907	10.78	0.06%	0.19	0.19	226
uncultured Collinsella sp.	165190	10.44	0.06%	0.20	0.20	34
Rhizobiaceae bacterium UBA3490	1953065	9.71	0.05%	0.17	0.17	255
unclassified Proteobacteria (miscellaneous)	81684	9.4	0.05%	0.17	0.09	15
Tepidimonas sp. UBA997	1947650	8.91	0.05%	0.12	0.12	274
Novosphingobium sp. UBA6722	1946985	8.97	0.05%	0.18	0.19	485
Sphingobium sp.	1912891	8.88	0.05%	0.17	0.17	777
Ralstonia	48736	8.81	0.05%	0.20	0.20	10
Oxalobacteraceae bacterium	1871070	7.72	0.04%	0.12	0.12	280
Rhodocyclaceae bacterium UBA4043	1952842	7.68	0.04%	0.12	0.12	224
Betaproteobacteria bacterium UBA2592	1948455	6.32	0.03%	0.12	0.12	128
Acinetobacter sp. UBA3060	1945934	5.7	0.03%	0.16	0.19	26
Erythrobacter sp.	1042	5.06	0.03%	0.16	0.10	20
Candidatus Omnitrophica bacterium UBA6233	1953269	5.06	0.03%	0.12	0.12	49
Acinetobacter junii	40215	4.48	0.03%	0.15	0.32	16
Pseudomonas aeruginosa	287	2.39	0.01%	0.11	0.23	11


Comamonadaceae bacterium isolate UBA8497: 41.1%
Comamonadaceae bacterium UBA6202: 0.32%
Comamonadaceae bacterium UBA4184: 0.17%
Comamonadaceae bacterium UBA4962: 0.16%
Comamonadaceae bacterium UBA2121: 0.06%
Comamonas aquatica isolate UBA1287: 14.85%
Comamonas sp. UBA2122: 0.31%
Comamonas terrigena isolate UBA1883: 0.14%
Comamonas kerstersii isolate UBA11446: 0.1%
Acidovorax sp. isolate UBA10156: 6.18%
Acidovorax delafieldii isolate UBA3485: 4.68%
Ramlibacter tataouinensis UBA 12148 Branch: 0.46%
Alicycliphilus sp. UBA6761: 0.44%
Delftia acidovorans isolate UBA7618: 0.25%
Delftia lacustris isolate UBA2300: 0.13%
Polaromonas sp UBA 10026 Branch: 0.22%
Curvibacter sp. isolate UBA10131: 0.15%
Rhodoferax sp. UBA4409: 0.1%
Hydrogenophaga sp. isolate UBA12122: 0.1%
Hylemonella sp. UBA6679: 0.08%
Burkholderiales bacterium UBA1834: 0.42%
Burkholderiales bacterium UBA4200: 0.35%
Aquabacterium sp. UBA666: 0.48%
Tepidimonas sp. UBA997: 0.05%
Herbaspirillum sp. UBA812: 0.23%
Oxalobacteraceae bacterium isolate UBA8502: 0.04%
Achromobacter 3677 Branch: 0.24%
Ralstonia 9025 Branch: 0.05%
Thauera sp UBA 14220 Branch: 0.37%
Dechloromonas sp. UBA6271: 0.22%
Dechloromonas sp UBA 13933 Branch: 0.07%
Rhodocyclaceae bacterium UBA2250: 0.12%
Rhodocyclaceae bacterium UBA4043: 0.04%
uncultured Rhodocyclaceae bacterium isolate UMGS1167: 0.07%
Thiobacillus denitrificans UBA 10121 Branch: 0.83%
Betaproteobacteria bacterium UBA5582: 0.2%
Betaproteobacteria bacterium UBA7395: 0.19%
Betaproteobacteria bacterium UBA2293: 0.17%
Betaproteobacteria bacterium UBA2592: 0.03%
Candidatus Accumulibacter 1607 Branch: 0.14%
Blastomonas sp. UBA7677: 17.53%
Citromicrobium sp UBA 14033 Branch: 0.11%
Novosphingobium sp. UBA6722: 0.05%
Sphingobium sp. isolate UBA8887: 0.05%
Porphyrobacter sp. UBA7686: 0.24%
Erythrobacter sp. isolate UBA9181: 0.03%
Rhizobiaceae bacterium UBA3490: 0.05%
Deltaproteobacteria bacterium isolate UBA9968: 2.99%
Geobacter s 11299 Branch: 0.92%
Geobacter sp. UBA698: 0.31%
Desulfovibrio sp. UBA6121: 0.06%
Pseudomonas sp. isolate UBA12181: 0.4%
Pseudomonas sp UBA 3364 Branch: 0.16%
Pseudomonas kunmingensis isolate UBA915: 0.21%


Pseudomonas stutzeri isolate UBA4480: 0.14%
Pseudomonas aeruginosa isolate UBA7347: 0.01%
Acinetobacter lwoffii UBA 4042 Branch: 0.11%
Acinetobacter sp. UBA3060: 0.03%
Acinetobacter junii isolate UBA12054: 0.03%
Stenotrophomonas sp. isolate UBA11631: 0.27%
Proteobacteria bacterium UBA 13463 Branch: 0.05%
Holophagaceae bacterium isolate UBA8503: 1.06%
Cutibacterium acnes isolate UBA9075: 0.12%
Propionibacteriaceae bacterium UBA6214: 0.06%
uncultured Collinsella sp. isolate UMGS1790: 0.06%
Desulfosporosinus sp. isolate UBA8488: 0.06%
Candidatus Omnitrophica bacterium isolate UBA10183: 0.15%
Candidatus Omnitrophica bacterium UBA1562: 0.11%
Candidatus Omnitrophica bacterium UBA6233: 0.03%
bacterium UBA5577: 0.28%


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Rhodocyclaceae bacterium UBA4045: 0.04%
Rhodocyclaceae bacterium UBA2250: 0.12%
uncultured Rhodocyclaceae bacterium isolate UMGS1167: 0.07%
Thiobacillus denitrificans UBA 1021 Branch: 0.83%
Betaproteobacteria bacterium UBA5982: 0.2%
Betaproteobacteria bacterium UBA7395: 0.19%
Betaproteobacteria bacterium UBA2522: 0.03%
Betaproteobacteria bacterium UBA2293: 0.17%
Candidatus Accumulibacter 1607 Branch: 0.14%
Blastomonas sp. UBA7677: 17.53%
Citromicrobium sp. UBA 14033 Branch: 0.11%
Novosphingobium sp. UBA6722: 0.05%
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Candidatus Omnitrophica bacterium UBA10183: 0.15%
Candidatus Omnitrophica bacterium isolate UBA1562: 0.11%
Candidatus Omnitrophica bacterium UBA6233: 0.03%
bacterium UBA5577: 0.28%


Comamonas aquatica isolate UBA1287 - 14.85%
6.18% - Acidovorax sp. isolate UBA10156
4.68% - Acidovorax delafieldii isolate UBA3485
9 more
4 more
12 more
17.53% - Blastomonas sp. UBA7677
2.99% - Deltaproteobacteria bacterium isolate UBA9968
2 more
8 more
1.06% - Holophagaceae bacterium isolate UBA8503
Comamonadaceae bacterium isolate UBA8497 - 41.1%
Comamon..quatica
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Acido..x sp
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Acidovorax
Aci..dii
Proteobacteria
Bacteria
Comamonadaceae
Burkholderiales
Betapro..acteria
unclas..adaceae
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Alphapr..acteria
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Acidovorax delafieldii
Deltaproteobacteri
Holophagace
Acidovorax sp. isolate UBA1
Geobacter
Comamonadaceae bacterium isolate UBA8497: 41.1%
Comamonas aquatica isolate UBA1287: 14.85%
Blastomonas sp. UBA7677: 17.53%
bacte
Steno
Delft
Geobac
Curv
Pseu
Achro
Cand
Coma
Comamo
Hyl
De
un
Porph
Com
No
Te
Ra
Pr
Cand
Pseu
Hyd
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Herba
Thiobacil
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Beta
Rho
Burkho
Can
Coma
Aci
Cit
Rho
Aquabac
Polar
Thauer
Beta
Beta
Pseud
Ramliba
Pseudo
Burkhol
Alicycl

Genomic Sequencing Report

Microbac Oak Ridge WO# Z3G0106-03 **9/13/2023**

Client: Andrew Klingbell

Sample Project: PERSOM UDEX Release, Former PHL Refineries 2134030309

Sample ID: S-438-20230720

Sample Collected: 7/20/2023

qPCR Overview: Estimated Bacterial Biomass 2.5e10 gc/L

NCBI Taxonomy Browser to look up "Taxonomy Id"
https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi add number in "Search for" in upper left box.

Summary:

- There were 6.110 reads for this sample and the file size was 1.25 GB.
- There were 156 identifications (ID's) in the bacterial data set.
- There were 0 identifications in the virus data set.
- There were 6 identifications in the protists data set.
- There were 11 identifications in the fungal data set.
- There were 43 identifications in the Combined Kingdom data set.
- There was 1 identification in the Antimicrobial Resistance data set.
- There were 66 identifications in the Virulence Factors data set.
- There were 6 identifications in the phages data set.
- There were 164 identifications in the Dark Matter (Beta) data set.

The Oak Ridge Microbac laboratory uses the CosmosID bioinformatics pipeline and cloud computing platform for analysis and report generation. The report consists of tables and figures for bacteria, antibiotic resistance genes, fungi, protists, phages, viruses, secondary bacterial (Dark Matter) and virulence genes.

Report Definitions

- **Name:** The name for the organism or taxonomic level or the name of the antibiotic resistance gene or virulence factor.
- **Calls at different taxonomic levels:** In the results there may be some calls at sub-species or strain level and others at species or genus level or higher. CosmosID calls the lowest level

possible based on the identification of unique kmers that match the reference genomes. If identification was not possible at strain level, for example, there will be a try to make an identification at species level etc.

- **Tax ID:** The tax id is the NCBI taxonomic id for the organism.
- **Frequency:** The number of unique kmer occurrences in the queried sample. This is roughly equivalent to the number of reads that matched to the organism identified.
- **Unique Matches:** Unique matches percent is the amount of unique kmers that were found in the sample for an organism out of the total possible number of kmers in the database that are unique to that organism.
- **Total Matches:** The shared plus unique matches divided by the pre-calculated shared plus unique matches possible in the reference database.
- **Relative Abundance:** Relative abundance is calculated based on the number of organism specific kmers and their observed frequency in the sample and then normalized to represent the abundance of each organism.

The following are the methods used for sample processing and analysis for this project:

DNA Extraction :

DNA samples were quantified using Qubit 4 fluorometer and Qubit™ dsDNA HS Assay Kit (Thermofisher Scientific).

Library Preparation and Sequencing:

DNA libraries were prepared using the Nextera XT DNA Library Preparation Kit (Illumina) and IDT Unique Dual Indexes with total DNA input of 1ng. Genomic DNA was fragmented using a proportional amount of Illumina Nextera XT fragmentation enzyme. Unique dual indexes were added to each sample followed by 12 cycles of PCR to construct libraries. DNA libraries were purified using AMpure magnetic Beads (Beckman Coulter) and eluted in QIAGEN EB buffer. DNA libraries were quantified using Qubit 4 fluorometer and Qubit™ dsDNA HS Assay Kit. Libraries were then sequenced on an Illumina NextSeq 2000 platform 2x150bp

Bioinformatics Analysis:

Unassembled sequencing reads were directly analyzed by CosmosID-HUB Microbiome Platform (CosmosID Inc., Germantown, MD) described elsewhere (Ottensen et al., 2016, Ponnusamy et al., 2016, Hasan et al., 2014, Lax et al., 2014) for multi-kingdom microbiome analysis and profiling of antibiotic resistance and virulence genes and quantification of organisms' relative abundance. Briefly, the system utilizes curated genome databases and a high performance data-mining algorithm that rapidly disambiguates hundreds of millions of metagenomic sequence reads into the discrete microorganisms engendering the particular sequences. Similarly, the community resistome and virulome, the collection of antibiotic resistance and virulence associated genes in the microbiome, were also identified by querying the unassembled sequence reads against the CosmosID curated antibiotic resistance and virulence associated gene databases.

Fasta/q details

Name	Value
Hit	743506

Table

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Acidovorax sp. T1	1858609	20170.77	30.58%	37.86	56.42	2586
Acidovorax defluvii	86669	7147.37	10.84%	13.12	41.48	19290
Smithella sp. F21	1538640	4838	7.33%	41.26	41.26	27977
Diaphorobacter sp. J5-51	680496	3916.31	5.94%	6.67	31.36	3717
Lysobacter ruishenii	686800	3638.98	5.52%	30.82	30.92	47524
Acidovorax ebreus TPSY	535289	3614.72	5.48%	4.69	29.28	2743
Acidovorax carolinensis	553814	3476.82	5.27%	5.58	13.90	14208
Pseudoxanthomonas spadix BD-a59	1045855	2032.57	3.08%	18.86	18.87	22175
Xanthobacter autotrophicus Py2	78245	1576.91	2.39%	6.85	10.34	30655
Xanthobacter sp. 29k	2607286	1550.6	2.35%	6.60	10.39	27307
Pseudomonas sp. Chol1	440512	1285.74	1.95%	8.53	17.98	5191
Simplicispira hankyongi	2315688	1211.97	1.84%	11.74	11.78	15560
Azospira sp. I09	1765049	1143.63	1.73%	5.92	11.39	2811
Azospira oryzae PS	640081	1046.92	1.59%	4.42	10.49	2275
Pseudomonas aeruginosa BWHPSA026	1402526	817.29	1.24%	20.05	5.67	2223
Geothrix fermentans DSM 14018	1121920	767.33	1.16%	7.82	7.82	9272
Rhodanobacter thiooxydans LCS2	1163409	755.12	1.15%	7.60	7.69	9274
Lysobacter enzymogenes	69	644.03	0.98%	6.03	6.49	9825
Aromatoleum tolulyticum	34027	541.38	0.82%	4.85	5.56	7624
Extensimonas perlucida	2590786	378.52	0.57%	4.13	4.11	5437
Variovorax sp. PDC80	1882827	343.22	0.52%	2.77	3.62	4388
Zoogloea oleivorans	1552750	334.46	0.51%	3.35	3.63	5271
Candidatus Saccharibacteria bacterium RAAC3_TM7_1	1394711	297.46	0.45%	4.01	4.01	1163
Spartobacteria bacterium LR76	2161866	273.73	0.42%	2.13	2.90	4120
unclassified Ralstonia	209769	257.71	0.39%	7.51	7.51	25

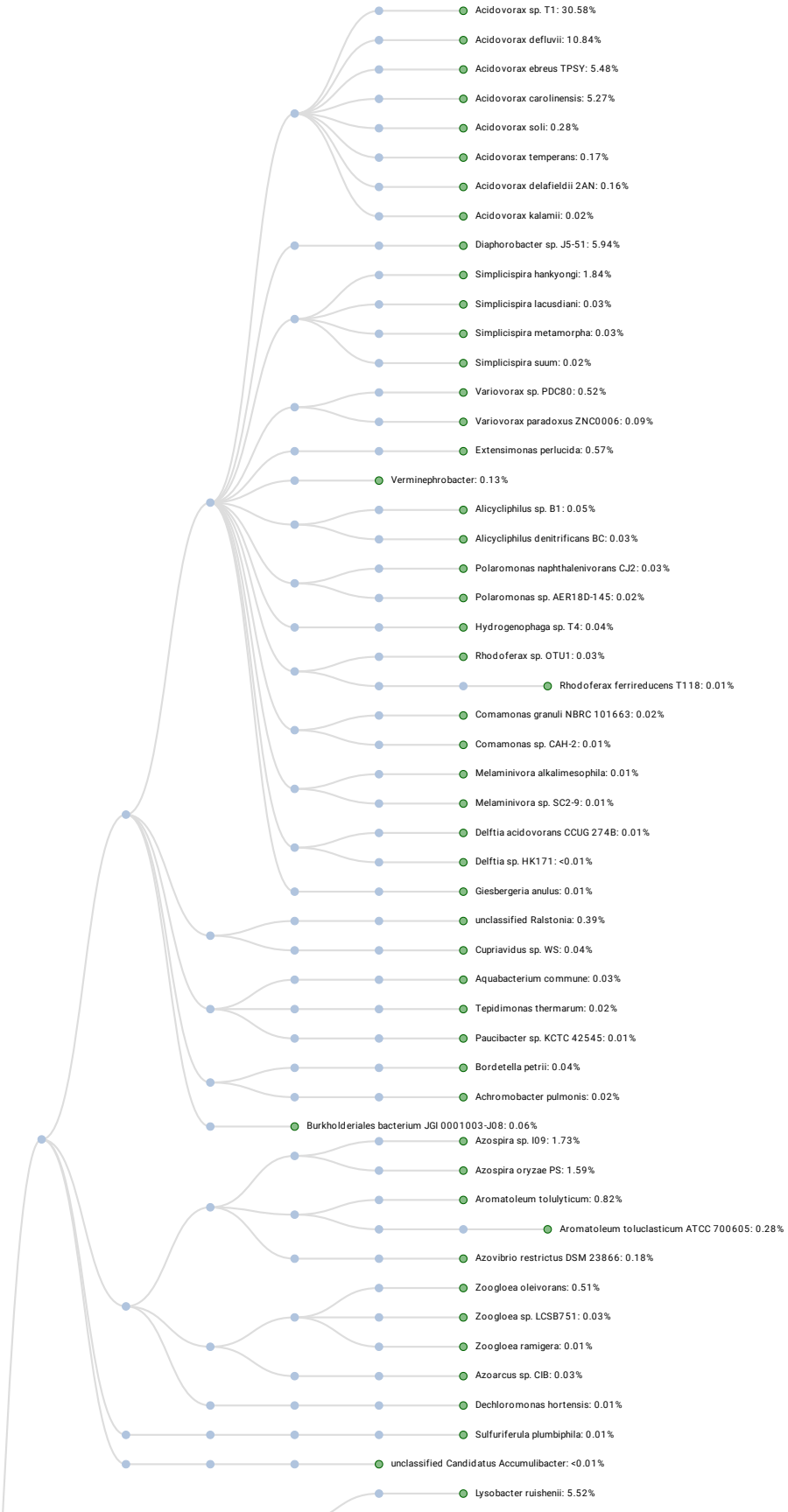
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Mycobacterium sp. YC-RL4	1682113	240.87	0.37%	2.74	2.75	4166
Caulobacter sp. 602-1	2492472	206.95	0.31%	1.88	2.35	3100
Aromatoleum toluclasticum ATCC 700605	1261621	185.69	0.28%	1.54	2.13	2474
Acidovorax soli	592050	182.25	0.28%	0.99	1.68	5196
Desulfovibrio termitidis HI1	644897	174.4	0.26%	1.87	2.06	2516
Sulfurospirillum halorespirans DSM 13726	1193502	171.84	0.26%	1.81	2.25	941
Peptococcaceae bacterium SCADC1_2_3	1487582	162.15	0.25%	2.24	2.24	1010
Anaerosporomusa subterranea	1794912	128.34	0.19%	1.65	1.65	1539
Azovibrio restrictus DSM 23866	1121035	115.61	0.18%	0.91	0.94	3405
Nitrosarchaeum	1007082	115.03	0.17%	5.30	5.30	7
Acidovorax temperans	80878	110.29	0.17%	0.80	0.83	4241
Acidovorax delafieldii 2AN	573060	107.97	0.16%	0.67	0.75	5422
Verminephrobacter	364316	87.3	0.13%	1.11	1.11	30
Terrimicrobium sacchariphilum	690879	78.56	0.12%	0.96	1.80	1854
Pseudomonas stutzeri TS44	477228	61.18	0.09%	0.83	5.62	908
Variovorax paradoxus ZNC0006	1339235	60.45	0.09%	0.80	2.17	1314
Zavarzinia aquatilis	2211142	51.96	0.08%	0.70	0.73	1112
Aquabacter spiritensis	933073	50.26	0.08%	0.61	0.61	1467
Sulfurospirillum multivorans DSM 12446	1150621	46.5	0.07%	0.74	1.37	401
Mycolicibacterium vanbaalenii PYR-1	350058	46.07	0.07%	0.72	1.25	472
Verrucomicrobium spinosum DSM 4136 = JCM 18804	240016	42.29	0.06%	0.59	0.65	908
Rectinema subterraneum	2653714	40.46	0.06%	0.43	0.43	766
Burkholderiales bacterium JGI 0001003-J08	1235982	36.48	0.06%	0.54	0.54	220
Phenylobacterium zucineum HLK1	450851	34.92	0.05%	0.48	0.53	901
unclassified Mesorhizobium	325217	33.68	0.05%	0.89	0.89	35
Aquabacter cavernae	2496029	33.37	0.05%	0.46	0.46	841
Alicycliphilus sp. B1	1603291	33.12	0.05%	0.40	0.48	520
Propionicimonas paludicola	185243	32.91	0.05%	0.48	0.48	617
Microbacterium lacus	415217	30.38	0.05%	0.51	0.69	293

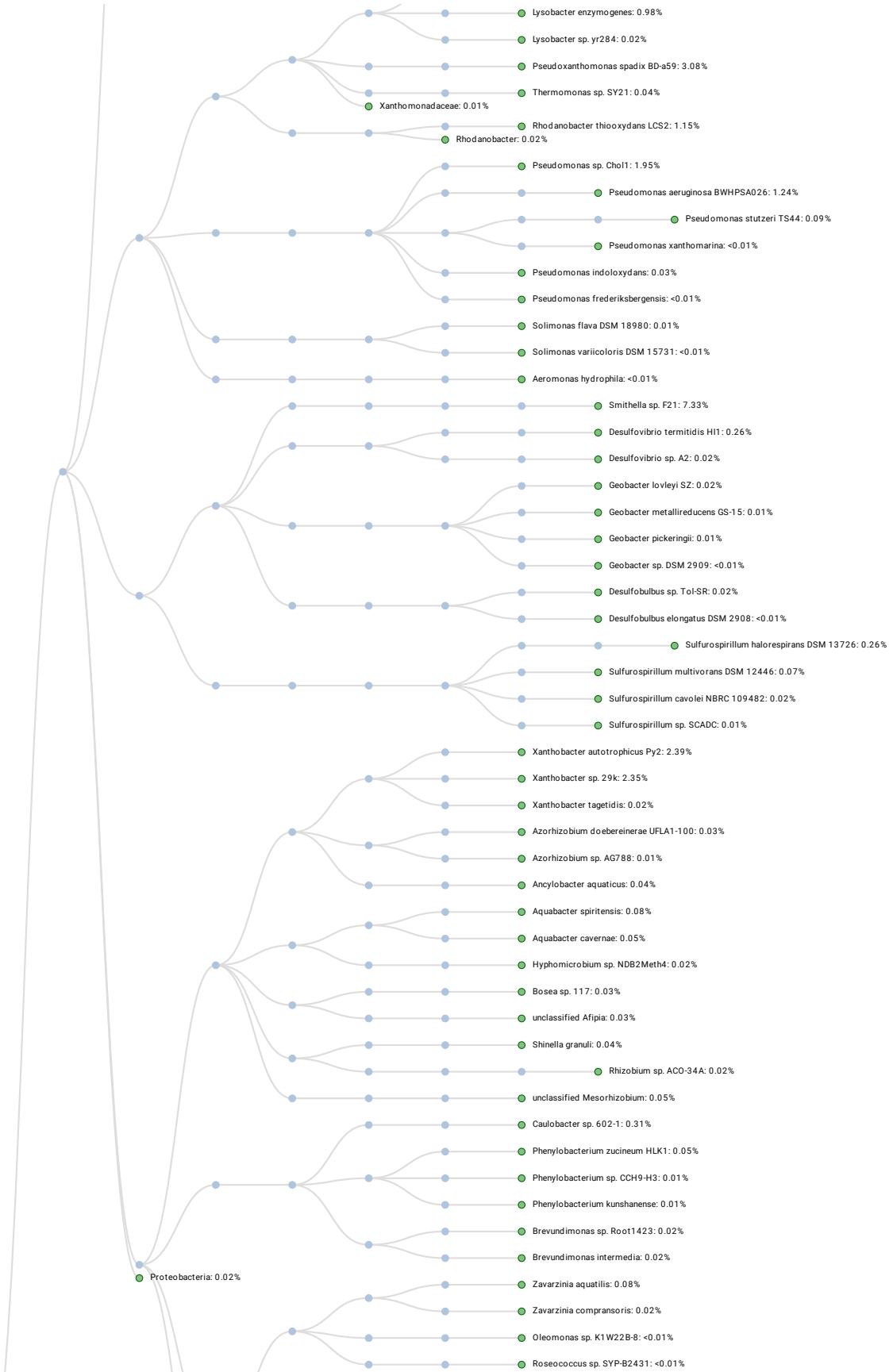
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Cupriavidus sp. WS	1312922	28.36	0.04%	0.43	0.26	452
Hydrogenophaga sp. T4	1437444	27.82	0.04%	0.27	0.53	1086
Ancylobacter aquaticus	100	27.36	0.04%	0.44	0.34	1264
Shinella granuli	323621	25.5	0.04%	0.38	0.23	550
Bordetella petrii	94624	24.8	0.04%	0.27	0.34	1099
Thermomonas sp. SY21	2202149	24.78	0.04%	0.37	0.37	468
Mycolicibacterium austroafricanum	39687	25.34	0.04%	0.42	1.13	323
Verrucomicrobia	74201	24.19	0.04%	80.00	80.00	5
Methanoregula boonei 6A8	456442	24.59	0.04%	0.22	0.25	724
Simplicispira lacusdiani	2213010	23	0.03%	0.18	0.19	1101
Zoogloea sp. LCSB751	1965277	22.2	0.03%	0.32	0.37	632
Pseudomonas indoloxydans	404407	21.19	0.03%	0.34	0.19	225
Alicycliphilus denitrificans BC	596153	20.47	0.03%	0.42	0.26	252
Azoarcus sp. CIB	198107	20.6	0.03%	0.31	1.64	516
Niveispirillum cyanobacteriorum	1612173	19.73	0.03%	0.31	0.39	446
Desulfosporosinus sp. Tol-M	1536651	20.05	0.03%	0.36	0.36	214
Polaromonas naphthalenivorans CJ2	365044	19	0.03%	0.26	0.29	630
Simplicispira metamorpha	80881	18.96	0.03%	0.15	0.16	912
Bosea sp. 117	1125973	19.09	0.03%	0.28	0.29	518
Azorhizobium doebereinerae UFLA1-100	1038858	19.45	0.03%	0.27	0.29	604
Aquabacterium commune	70586	18.52	0.03%	0.29	0.30	433
unclassified Afipia	2642050	18.32	0.03%	0.21	0.19	486
Methanothrix soehngenii GP6	990316	17.54	0.03%	0.33	0.33	149
Rhodoferax sp. OTU1	2109322	17.12	0.03%	0.17	0.18	960
Parcubacteria bacterium RAAC4_OD1_1	1394712	16.4	0.03%	0.40	0.40	38
Polaromonas sp. AER18D-145	1977060	16.09	0.02%	0.15	0.28	762
Xanthobacter tagetidis	60216	15.89	0.02%	0.21	0.29	615
Ferrovibrio terrae	2594003	14.74	0.02%	0.23	0.23	368
Brevundimonas sp. Root1423	1736462	13.68	0.02%	0.23	0.39	269
Microbacterium sp. C448	1177594	13.75	0.02%	0.26	0.61	148
Desulfobulbus sp. Tol-SR	1536652	13.13	0.02%	0.23	0.23	240
Leptospira	171	13.4	0.02%	25.93	25.93	8
Streptococcus thermophilus	1308	13.16	0.02%	0.37	0.34	28

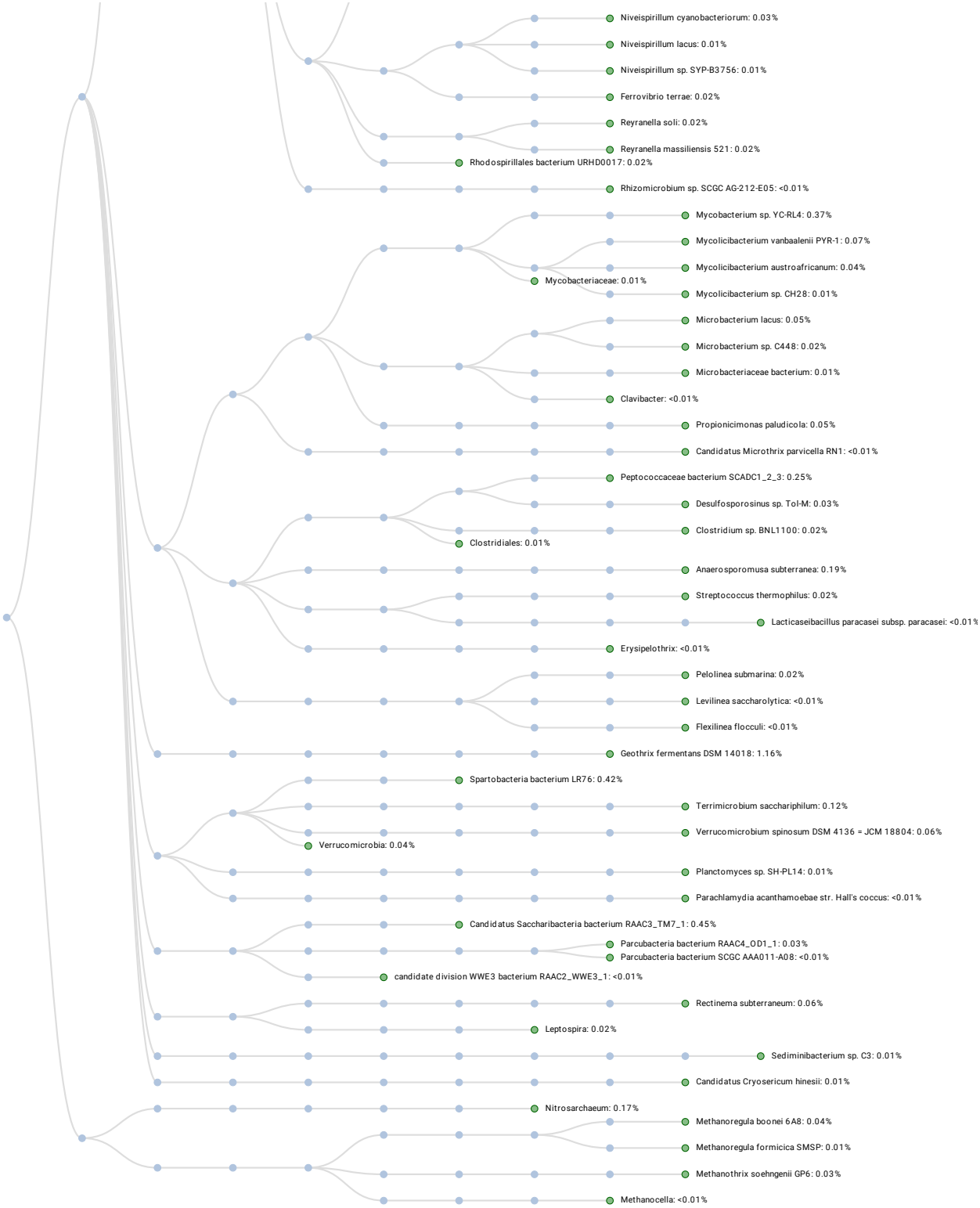
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Acidovorax kalamii	2004485	12.73	0.02%	0.10	0.13	681
Simplicispira suum	2109915	12.6	0.02%	0.12	0.25	656
Tepidimonas thermarum	335431	12.22	0.02%	0.16	0.16	418
Proteobacteria	1224	12.86	0.02%	13.83	13.83	124
Comamonas granuli NBRC 101663	1223521	11.6	0.02%	0.13	0.14	484
Achromobacter pulmonis	1389932	11.92	0.02%	0.11	0.10	384
Geobacter lovleyi SZ	398767	11.64	0.02%	0.16	0.19	331
Sulfurospirillum cavolei NBRC 109482	1349788	12	0.02%	0.23	0.25	153
Rhodospirillales bacterium URHD0017	1380357	12.07	0.02%	0.19	0.40	362
Clostridium sp. BNL1100	755731	12.16	0.02%	0.25	0.22	103
Reyranella soli	1230389	11.46	0.02%	0.18	0.39	343
Desulfovibrio sp. A2	298701	10.62	0.02%	0.19	0.40	202
Lysobacter sp. yr284	1761791	10.83	0.02%	0.18	0.86	298
Rhodanobacter	75309	10.74	0.02%	0.22	0.29	16
Reyranella massiliensis 521	1205680	10.77	0.02%	0.17	0.25	317
Hyphomicrobium sp. NDB2Meth4	1892846	10.23	0.02%	0.17	0.17	267
Zavarzinia compransoris	1264899	9.9	0.02%	0.17	0.21	247
Rhizobium sp. ACO-34A	1571470	9.9	0.02%	0.17	0.17	278
Brevundimonas intermedia	74315	9.9	0.02%	0.18	0.21	208
Pelolinea submarina	913107	9.75	0.02%	0.18	0.18	176
Delftia acidovorans CCUG 274B	883101	9.39	0.01%	0.18	0.41	93
Dechloromonas hortensis	337779	9.1	0.01%	0.15	0.15	252
Geobacter metallireducens GS-15	269799	9.29	0.01%	0.34	4.40	13
Niveispirillum lacus	1981099	9.41	0.01%	0.16	0.25	233
Azorhizobium sp. AG788	2183897	9.37	0.01%	0.14	0.13	270
Microbacteriaceae bacterium	1873462	9.4	0.01%	0.16	0.16	282
Melaminivora alkalimesophila	1165852	8.52	0.01%	0.10	0.10	323
Sulfurospirillum sp. SCADC	1537915	8.27	0.01%	0.17	0.47	95
Xanthomonadaceae	32033	8.57	0.01%	0.23	0.23	5
Mycobacteriaceae	1762	8.27	0.01%	0.32	0.32	4
Clostridiales	186802	8.35	0.01%	6.23	6.23	57
Comamonas sp. CAH-2	2605745	8.1	0.01%	0.12	0.19	162

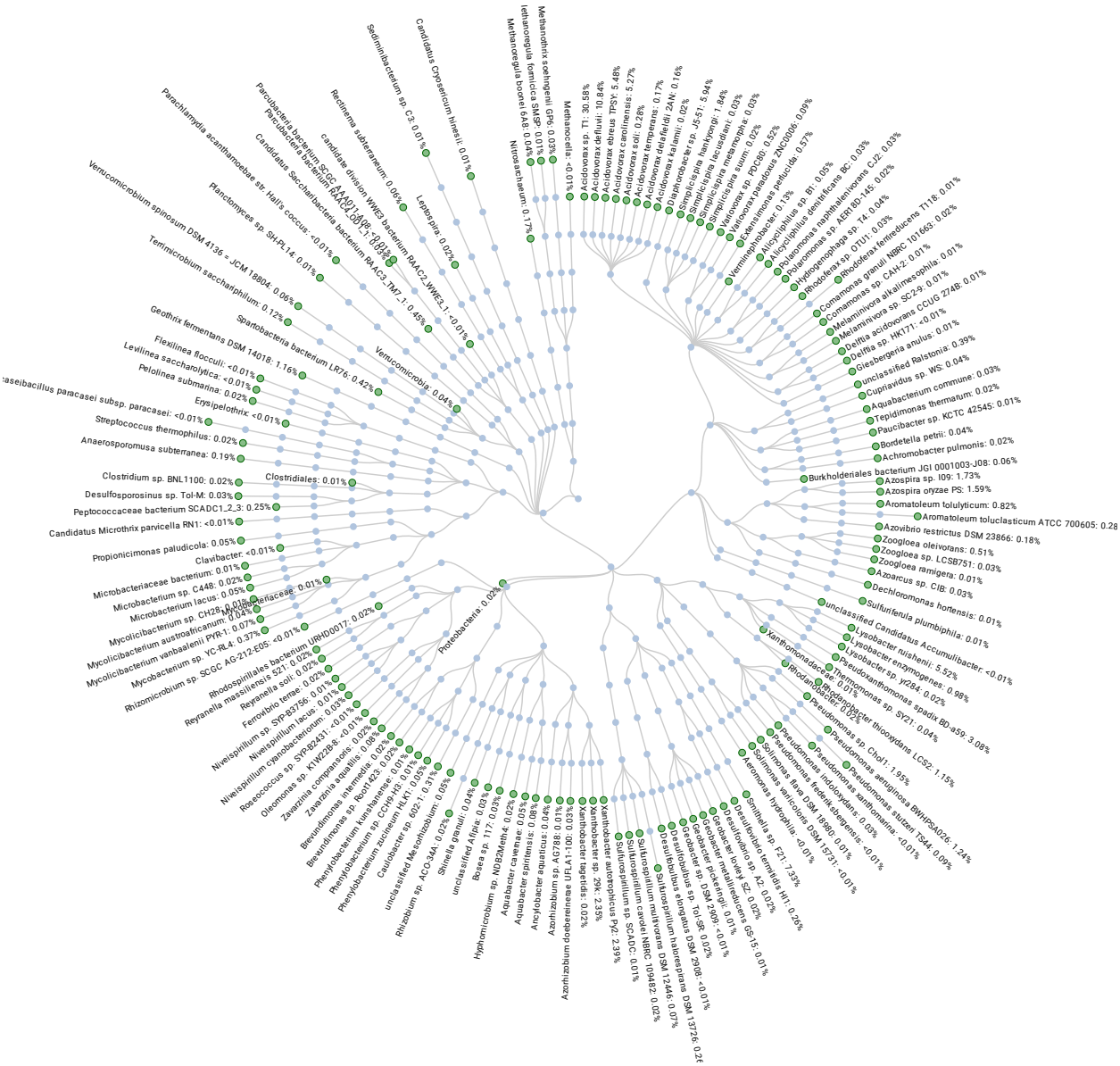
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Rhodoferax ferrireducens T118	338969	8.19	0.01%	0.13	0.13	289
Geobacter pickeringii	345632	7.92	0.01%	0.13	0.20	224
Niveispirillum sp. SYP-B3756	2662178	7.81	0.01%	0.14	0.17	182
Planctomyces sp. SH-PL14	1632864	7.76	0.01%	0.14	0.14	210
Melaminivora sp. SC2-9	2109913	7.46	0.01%	0.11	0.36	263
Zoogloea ramigera	350	7.19	0.01%	0.13	0.19	963
Phenylobacterium sp. CCH9-H3	1768774	7.48	0.01%	0.28	0.54	17
Sediminibacterium sp. C3	1267211	6.95	0.01%	0.11	0.22	115
Methanoregula formicica SMSP	593750	7.53	0.01%	0.10	0.12	257
Giesbergeria anulus	180197	6.65	0.01%	0.14	0.14	499
Paucibacter sp. KCTC 42545	1768242	6.33	0.01%	0.12	0.14	236
Sulfuriferula plumbiphila	171865	6.44	0.01%	0.12	0.13	152
Solimonas flava DSM 18980	1123257	6.48	0.01%	0.12	0.14	189
Phenylobacterium kunshanense	1445034	6.48	0.01%	0.11	0.14	222
Mycolicibacterium sp. CH28	2512237	6.28	0.01%	0.12	0.11	172
Candidatus Cryosericum hinesii	2290915	6.41	0.01%	0.14	0.14	89
Delftia sp. HK171	1920191	5.77	<0.01%	0.15	1.03	42
Pseudomonas frederiksbergensis	104087	6.22	<0.01%	0.12	0.12	2027
Oleomonas sp. K1W22B-8	2320859	6.17	<0.01%	0.11	0.11	180
Rhizomicrobium sp. SCGC AG-212-E05	1799655	5.71	<0.01%	0.13	0.13	54
Candidatus Microthrix parvicella RN1	1229780	5.76	<0.01%	0.14	0.11	52
Levilinea saccharolytica	229921	6.1	<0.01%	0.12	0.12	132
Parcubacteria bacterium SCGC AAA011-A08	1046985	6.26	<0.01%	0.18	0.18	21
Parachlamydia acanthamoebae str. Hall's coccus	159254	6.1	<0.01%	0.27	0.22	8
unclassified Candidatus Accumulibacter	2619054	5.53	<0.01%	0.10	0.10	16
Geobacter sp. DSM 2909	2135459	5.3	<0.01%	0.10	0.10	201
Desulfobulbus elongatus DSM 2908	1121402	5.4	<0.01%	0.11	0.11	125
Aeromonas hydrophila	644	5.08	<0.01%	0.55	0.55	2

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Solimonas variicoloris DSM 15731	1123256	5.04	<0.01%	0.10	0.13	556
Roseococcus sp. SYP-B2431	2496640	5.46	<0.01%	0.10	0.10	158
Methanocella	570266	4.99	<0.01%	13.33	13.33	5
Flexilinea flocculi	1678840	4.8	<0.01%	0.11	0.11	69
Pseudomonas xanthomarina	271420	4.22	<0.01%	0.11	0.22	42
candidate division WWE3 bacterium RAAC2_WWE3_1	1394710	3.45	<0.01%	0.11	0.11	20
Clavibacter	1573	1.16	<0.01%	0.19	0.19	30
Erysipelothrix	1647	1.47	<0.01%	0.13	0.13	3
Lacticaseibacillus paracasei subsp. paracasei	47714	1.09	<0.01%	0.12	0.12	2

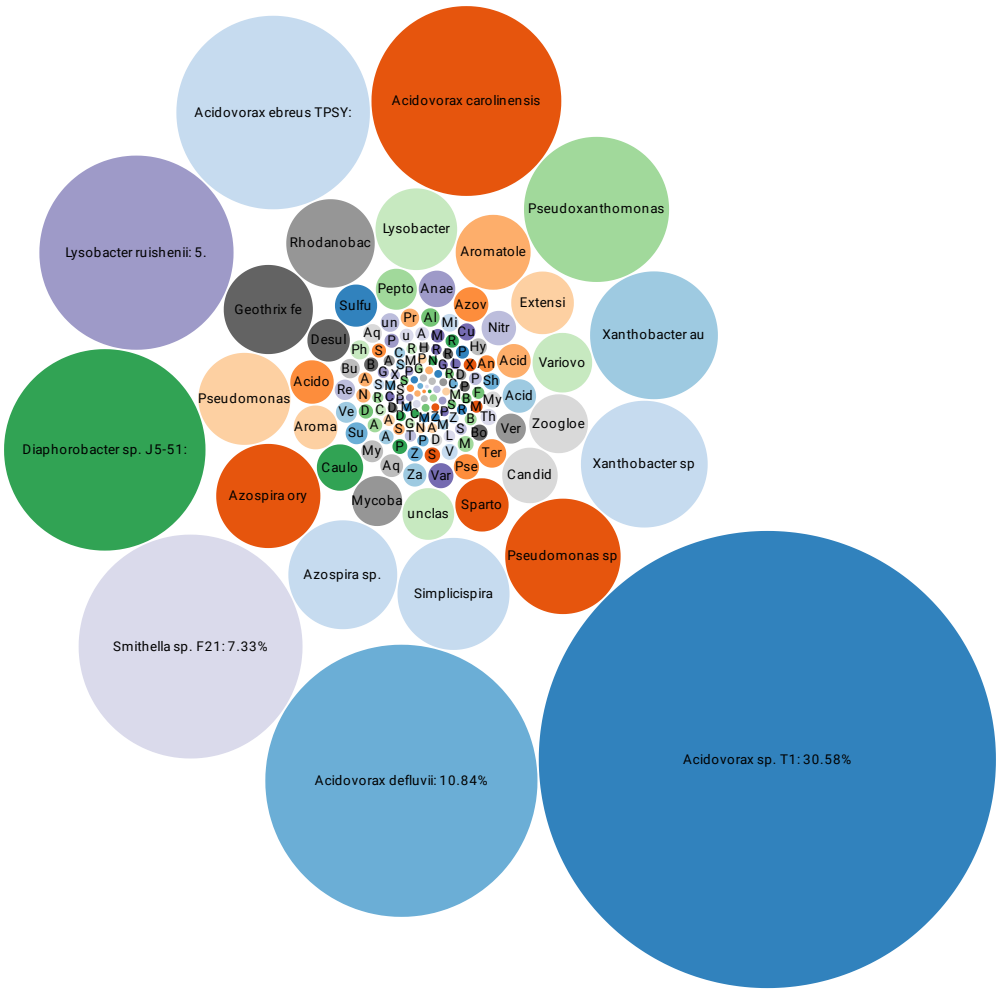

Acidovorax sp. T1: 30.58%
Acidovorax defluvii: 10.84%
Acidovorax ebreus TPSY: 5.48%
Acidovorax carolinensis: 5.27%
Acidovorax soli: 0.28%
Acidovorax temperans: 0.17%
Acidovorax delafieldii 2AN: 0.16%
Acidovorax kalamii: 0.02%
Diaphorobacter sp. J5-51: 5.94%
Simplicispira hankyongi: 1.84%
Simplicispira lacusdiani: 0.03%
Simplicispira metamorpha: 0.03%
Simplicispira suum: 0.02%
Variovorax sp. PDC80: 0.52%
Variovorax paradoxus ZNC0006: 0.09%
Extensimonas perlucida: 0.57%
Verminephrobacter: 0.13%
Alicycliphilus sp. B1: 0.05%
Alicycliphilus denitrificans BC: 0.03%
Polaromonas naphthalenivorans CJ2: 0.03%
Polaromonas sp. AER18D-145: 0.02%
Hydrogenophaga sp. T4: 0.04%
Rhodoferax sp. OTU1: 0.03%
Rhodoferax ferrireducens T118: 0.01%
Comamonas granuli NBRC 101663: 0.02%
Comamonas sp. CAH-2: 0.01%
Melaminivora alkalimesophila: 0.01%
Melaminivora sp. SC2-9: 0.01%
Delftia acidovorans CCUG 274B: 0.01%
Delftia sp. HK171: <0.01%
Giesbergeria anulus: 0.01%
unclassified Ralstonia: 0.39%
Cupriavidus sp. WS: 0.04%
Aquabacterium commune: 0.03%
Tepidimonas thermarum: 0.02%
Paucibacter sp. KCTC 42545: 0.01%
Bordetella petrii: 0.04%
Achromobacter pulmonis: 0.02%
Burkholderiales bacterium JGI 0001003-J08: 0.06%
Azospira sp. I09: 1.73%
Azospira oryzae PS: 1.59%
Aromatoleum tolulyticum: 0.82%
Aromatoleum toluclasticum ATCC 700605: 0.28%
Azovibrio restrictus DSM 23866: 0.18%
Zoogloea oleivorans: 0.51%
Zoogloea sp. LCSB751: 0.03%
Zoogloea ramigera: 0.01%
Azoarcus sp. CIB: 0.03%
Dechloromonas hortensis: 0.01%
Sulfuriferula plumbiphila: 0.01%
unclassified Candidatus Accumulibacter: <0.01%
Lysobacter ruishenii: 5.52%


Lysobacter enzymogenes: 0.98%
Lysobacter sp. yr284: 0.02%
Pseudoxanthomonas spadix BD-a59: 3.08%
Thermomonas sp. SY21: 0.04%
Xanthomonadaceae: 0.01%
Rhodanobacter thiooxydans LCS2: 1.15%
Rhodanobacter: 0.02%
Pseudomonas sp. Chol1: 1.95%
Pseudomonas aeruginosa BWHPSA026: 1.24%
Pseudomonas stutzeri TS44: 0.09%
Pseudomonas xanthomarina: <0.01%
Pseudomonas indoloxydans: 0.03%
Pseudomonas frederiksbergensis: <0.01%
Solimonas flava DSM 18980: 0.01%
Solimonas variicoloris DSM 15731: <0.01%
Aeromonas hydrophila: <0.01%
Smithella sp. F21: 7.33%
Desulfovibrio termitidis HI1: 0.26%
Desulfovibrio sp. A2: 0.02%
Geobacter lovleyi SZ: 0.02%
Geobacter metallireducens GS-15: 0.01%
Geobacter pickeringii: 0.01%
Geobacter sp. DSM 2909: <0.01%
Desulfobulbus sp. Tol-SR: 0.02%
Desulfobulbus elongatus DSM 2908: <0.01%
Sulfurospirillum halorespirans DSM 13726: 0.26%
Sulfurospirillum multivorans DSM 12446: 0.07%
Sulfurospirillum cavolei NBRC 109482: 0.02%
Sulfurospirillum sp. SCADC: 0.01%
Xanthobacter autotrophicus Py2: 2.39%
Xanthobacter sp. 29k: 2.35%
Xanthobacter tagetidis: 0.02%
Azorhizobium doebereinerae UFLA1-100: 0.03%
Azorhizobium sp. AG788: 0.01%
Ancylobacter aquaticus: 0.04%
Aquabacter spiritensis: 0.08%
Aquabacter cavernae: 0.05%
Hyphomicrobium sp. NDB2Meth4: 0.02%
Bosea sp. 117: 0.03%
unclassified Afipia: 0.03%
Shinella granuli: 0.04%
Rhizobium sp. ACO-34A: 0.02%
unclassified Mesorhizobium: 0.05%
Caulobacter sp. 602-1: 0.31%
Phenylobacterium zucineum HLK1: 0.05%
Phenylobacterium sp. CCH9-H3: 0.01%
Phenylobacterium kunshanense: 0.01%
Brevundimonas sp. Root1423: 0.02%
Brevundimonas intermedia: 0.02%
Proteobacteria: 0.02%
Zavarzinia aquatilis: 0.08%
Zavarzinia compransoris: 0.02%
Oleomonas sp. K1W22B-8: <0.01%
Roseococcus sp. SYP-B2431: <0.01%


Niveispirillum cyanobacteriorum: 0.03%
Niveispirillum lacus: 0.01%
Niveispirillum sp. SYP-B3756: 0.01%
Ferrovibrio terrae: 0.02%
Reyranella soli: 0.02%
Reyranella massiliensis 521: 0.02%
Rhodospirillales bacterium URHD0017: 0.02%
Rhizomicrobium sp. SCGC AG-212-E05: <0.01%
Mycobacterium sp. YC-RL4: 0.37%
Mycolicibacterium vanbaalenii PYR-1: 0.07%
Mycolicibacterium austroafricanum: 0.04%
Mycobacteriaceae: 0.01%
Mycolicibacterium sp. CH28: 0.01%
Microbacterium lacus: 0.05%
Microbacterium sp. C448: 0.02%
Microbacteriaceae bacterium: 0.01%
Clavibacter: <0.01%
Propionicimonas paludicola: 0.05%
Candidatus Microthrix parvicella RN1: <0.01%
Peptococcaceae bacterium SCADC1_2_3: 0.25%
Desulfosporosinus sp. Tol-M: 0.03%
Clostridium sp. BNL1100: 0.02%
Clostridiales: 0.01%
Anaerosporomusa subterranea: 0.19%
Streptococcus thermophilus: 0.02%
Lacticaseibacillus paracasei subsp. paracasei: <0.01%
Erysipelothrix: <0.01%
Pelolinea submarina: 0.02%
Levilinea saccharolytica: <0.01%
Flexilinea flocculi: <0.01%
Geothrix fermentans DSM 14018: 1.16%
Spartobacteria bacterium LR76: 0.42%
Terrimicrobium saccharophilum: 0.12%
Verrucomicrobium spinosum DSM 4136 = JCM 18804: 0.06%
Verrucomicrobia: 0.04%
Planctomyces sp. SH-PL14: 0.01%
Parachlamydia acanthamoebae str. Hall's coccus: <0.01%
Candidatus Saccharibacteria bacterium RAAC3_TM7_1: 0.45%
Parcubacteria bacterium RAAC4_OD1_1: 0.03%
Parcubacteria bacterium SCGC AAA011-A08: <0.01%
candidate division WWE3 bacterium RAAC2_WWE3_1: <0.01%
Rectinema subterraneum: 0.06%
Leptospira: 0.02%
Sediminibacterium sp. C3: 0.01%
Candidatus Cryosericum hinesii: 0.01%
Nitrosarchaeum: 0.17%
Methanoregula boonei 6A8: 0.04%
Methanoregula formicica SMSP: 0.01%
Methanothrix soehngenii GP6: 0.03%
Methanocella: <0.01%


Methanothrix soehngenii GP6: 0.03%
Methanosarcina: <0.01%
Acidovorax sp. T1: 30.58%
Acidovorax defluvii: 10.84%
Acidovorax ebreus TPSY: 5.48%
Acidovorax carolinensis: 5.27%
Acidovorax soli: 0.28%
Acidovorax temperans: 0.17%
Acidovorax delafieldii 2AN: 0.16%
Acidovorax kalamii: 0.02%
Diaphorobacter sp. JS-51: 5.94%
Simplicispira hankyongi: 1.84%
Simplicispira lacusdiani: 0.03%
Simplicispira metamorpha: 0.02%
Variovorax sp. PD30: 0.52%
Variovorax paradoxus ZAC00006: 0.09%
Xenamonas sp. PDC: 0.02%
Verminephrobacter: 0.13%
Alicycliphilus sp. B1: 0.05%
Alicycliphilus denitrificans BC: 0.03%
Polaromonas naphthalenivorans CJ2: 0.03%
Polaromonas sp. AER18D-145: 0.02%
Hydrogenophaga sp. T4: 0.04%
Rhodoferax sp. OTU1: 0.03%
Rhodoferax ferrireducens T118: 0.01%
Comamonas granuli NBRC 101665: 0.02%
Comamonas sp. CAH-2: 0.01%
Melaminivora alkalimesophila: 0.01%
Melaminivora sp. SC2-9: 0.01%
Delftia acidovorans CCUG 27248: 0.01%
Delftia sp. HK171: <0.01%
Giesbergeria anulus: 0.01%
Giesbergeria Ralstonia: 0.39%
unclassified Ralstonia: 0.04%
Cupriavidus sp. WS: 0.03%
Cupriavidus commune: 0.03%
Aquabacterium commune: 0.02%
Tepidimonas thermarum: 0.01%
Tepidimonas sp. KCTC 42545: 0.01%
Paucibacter sp. KCTC 42545: 0.01%
Bordetella petrii: 0.04%
Achromobacter pulmonis: 0.02%
Burkholderiales bacterium JGI 0001003-J08: 0.06%
Azospira sp. I09: 1.73%
Azospira oryzae PS: 1.59%
Aromatoleum tolulyticum: 0.82%
Aromatoleum toluclasticum ATCC 700605: 0.28
Azovibrio restrictus DSM 23866: 0.18%
Zoogloea oleivorans: 0.51%
Zoogloea sp. LCSB751: 0.03%
Zoogloea ramigera: 0.01%
Azoarcus sp. CIB: 0.03%
Dechloromonas hortensis: 0.01%
Sulfuriferula plumbiphila: 0.01%
unclassified Candidatus Accumulibacter: <0.01%
Lysobacter ruishenii: 5.52%
Lysobacter enzymogenes: 0.98%
Lysobacter sp. yr284: 0.02%
Thermomonas sp. SY21: 0.04%
Pseudoxanthomonas spadix BD-a59: 3.08%
Rhodanobacter thiooxydans LCS2: 1.15%
Rhodanobacter sp. B01: 0.01%
Xanthomonadaceae bacterium: 0.01%
Pseudomonas sp. Chol1: 1.95%
Pseudomonas aeruginosa BMHPSA026: 1.24%
Pseudomonas xanthomarina: <0.01%
Pseudomonas stutzeri TS44: 0.09%
Pseudomonas indoloxydans: 0.03%
Pseudomonas fredriksbergensis: <0.01%
Pseudomonas sp. 15331: <0.01%
Salinisphaera hydrothermalis: <0.01%
Aeromonas hydrophila: <0.01%
Shewanella sp. F21: 7.33%
Desulfovibrio termitidis HH1: 0.26%
Desulfovibrio sp. A2: 0.02%
Geobacter lovleyi SZ: 0.02%
Geobacter metallireducens GS-15: 0.01%
Geobacter pickeringii: 0.01%
Geobacter sp. DSM 2909: <0.01%
Desulfobulbus elongatus DSM 2908: <0.01%
Desulfobulbus sp. Tol-SR: 0.02%
Sulfurospirillum halorespirans DSM 13726: 0.2
Sulfurospirillum multivorans DSM 12446: 0.07%
Sulfurospirillum carolei NBRC 104482: 0.02%
Sulfurospirillum sp. SCADC: 0.01%
Sulfurospirillum arcachonense: 0.01%
Xanthobacter autotrophicus Py2: 2.35%
Xanthobacter sp. 29x: 2.35%
Xanthobacter tagetidis: 0.02%
Azorhizobium caulinodans ORS 571: 0.03%
Azorhizobium doebereinerae UFLA1-100: 0.03%
Azorhizobium sp. AG788: 0.01%
Ancylobacter aquaticus: 0.04%
Aquabacter spiritensis: 0.08%
Aquabacter cavernae: 0.05%
Aquabacter sp. N08ZMeth4: 0.02%
Hyphomicrobium sp. N08ZMeth4: 0.03%
Bosea sp. 117: 0.03%
unclassified Afipia: 0.03%
Shinella granuli: 0.04%
Shinella sp. ACO-34A: 0.02%
unclassified Mesorhizobium: 0.05%
Rhizobium sp. ACO-34A: 0.02%
Caulobacter sp. 602-1: 0.31%
unclassified Caulobacter zucineum HLK1: 0.05%
Phenylobacterium zucineum HLK1: 0.01%
Phenylobacterium kunshanense: 0.02%
Phenylobacterium sp. CCHR-H5: 0.01%
Phenylobacterium sp. Root423: 0.02%
Brevundimonas intermedia: 0.02%
Brevundimonas sp. Root423: 0.02%
Brevundimonas sp. SYP-B2431: <0.01%
Zavarzinia aquatilis: 0.08%
Zavarzinia compransoris: 0.02%
Zavarzinia sp. KTW22B-8: <0.01%
Oleomonas sp. SYP-B2431: <0.01%
Roseococcus sp. KTW22B-8: <0.01%
Niveispirillum cyanobacteriorum: 0.03%
Niveispirillum lacus: 0.01%
Niveispirillum sp. SYP-B3756: 0.01%
Ferrovibrio terrae: 0.01%
Reyranella massiliensis 521: 0.02%
Reyranella soli: 0.02%
Rhodospirillales bacterium URHD0017: 0.02%
Mycobacterium sp. SCGC AG-212-E05: <0.01%
Rhizomicrobium sp. YC-RL4: 0.37%
Mycolicibacterium vanbaalenii PYR-1: 0.07%
Mycolicibacterium austroafricanum: 0.04%
Mycolicibacterium sp. CH28: 0.01%
Microbacteriaceae: 0.01%
Microbacterium lacus: 0.05%
Microbacterium sp. C448: 0.02%
Microbacteriaceae bacterium: 0.01%
Clavibacter: <0.01%
Propionicimonas paludicola: 0.05%
Candidatus Microthrix parvicella RN1: <0.01%
Peptococcaceae bacterium SCADC1_2_3: 0.25%
Desulfosporosinus sp. Tol-M: 0.03%
Clostridium sp. BNL1100: 0.02%
Clostridiales: 0.01%
Anaerosporomusa subterranea: 0.19%
Streptococcus thermophilus: 0.02%
Erysipelothrix: <0.01%
Pelolinea submarina: 0.02%
Levilinea saccharolytica: <0.01%
Flexilinea flocculi: <0.01%
Geothrix fermentans DSM 14018: 1.16%
Spartobacteria bacterium LR76: 0.42%
Verrucomicrobia: 0.04%
Terrimicrobium saccharophilum: 0.12%
Planctomyces sp. SH-PL14: 0.01%
Candidatus Saccharibacteria bacterium RAAC3_TM7_1: 0.45%
Candidatus Saccharibacteria bacterium RAAC3_TM7_1: <0.01%
Parcubacteria bacterium SCGC AAA011-D09: <0.01%
Parcubacteria bacterium SCGC AAA011-D09: 0.03%
candidate division WWE3 bacterium RAAC2_WWE3_1: <0.01%
Rectinema subterraneum: 0.06%
Leptospira: 0.02%
Candidatus Cloacimonas hinesii: 0.01%
Sedimentibacterium sp. C3: 0.01%
Nitrosarchaeum: 0.17%
Methanocella: <0.01%
Methanoregula formicica SMSP: 0.01%
Methanoregula boonei 6A8: 0.04%
Parachlamydia acanthamoebae str. Hall's coccus: <0.01%
Verrucomicrobium spinosum DSM 4136 = JCM 18804: 0.06%
Aseibacillus paracasei subsp. paracasei: <0.01%
Proteobacteria: 0.02%


Acidovorax carolinensis - 5.27%
Acidovorax ebreus TPSY - 5.48%
5.94% - Diaphorobacter sp. J5-57
1.84% - Simplicispira hankyongi
18 more
2 more
1.73% - Azospira sp. I09
1.59% - Azospira oryzae PS
2 more
2 more
5.52% - Lysobacter ruishenii
3.08% - Pseudoxanthomonas spadix BD-a59
1.15% - Rhodanobacter thiooxydans LCS2
1.95% - Pseudomonas sp. Chol1
1.24% - Pseudomonas aeruginosa BWHPSA026
7.33% - Smithella sp. F21
4 more
2.39% - Xanthobacter autotrophicus Py2
2.35% - Xanthobacter sp. 29k
1.16% - Geothrix fermentans DSM 14018
Acidovorax sp. T1 - 30.58%
Acidovorax defluvii - 10.84%
Bacteria
Proteobacteria
Gammapr..acteria
Xanthomonadales
Xanthomonadaceae
Lysobacter
Lyso..enii
Rh..es
Rh..ae
A..a
Betapro..acteria
Burkholderiales
Comamonadaceae
Acidovorax
Acidovo..efluvii
Acid..reus
Acid..nsis
uncla...acter
Diap..cter
unclass..dovorax
delta/e..visions
Delta..teria
Syntr..rales
Syntrophaceae
Smithella
unclass..ithella
Al..ia
Rh..es
Xan..eae
Xan..ter
u..r
X..s
P..s
P..e
P..x

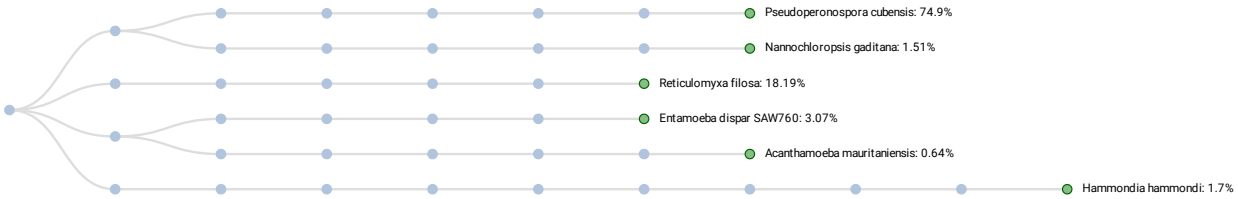

Acidovorax ebreus TPSY:
Acidovorax carolinensis
Pseudoxanthomonas
Lysobacter ruishenii: 5.
Rhodanobac
Lysobacter
Aromatole
Geothrix fe
Pepto
Anae
Azov
Extensi
Sulfu
Nitr
Xanthobacter au
Desul
Variovo
Acid
Pseudomonas
Acido
Acid
Diaphorobacter sp. J5-51:
Aroma
Zoogloe
Ver
Xanthobacter sp
Caulo
Ter
Azospira ory
Candid
Pse
Mycoba
unclas
Sparto
Pseudomonas sp
Azospira sp.
Simplicispira
Smithella sp. F21: 7.33%
Acidovorax defluvii: 10.84%
Acidovorax sp. T1: 30.58%

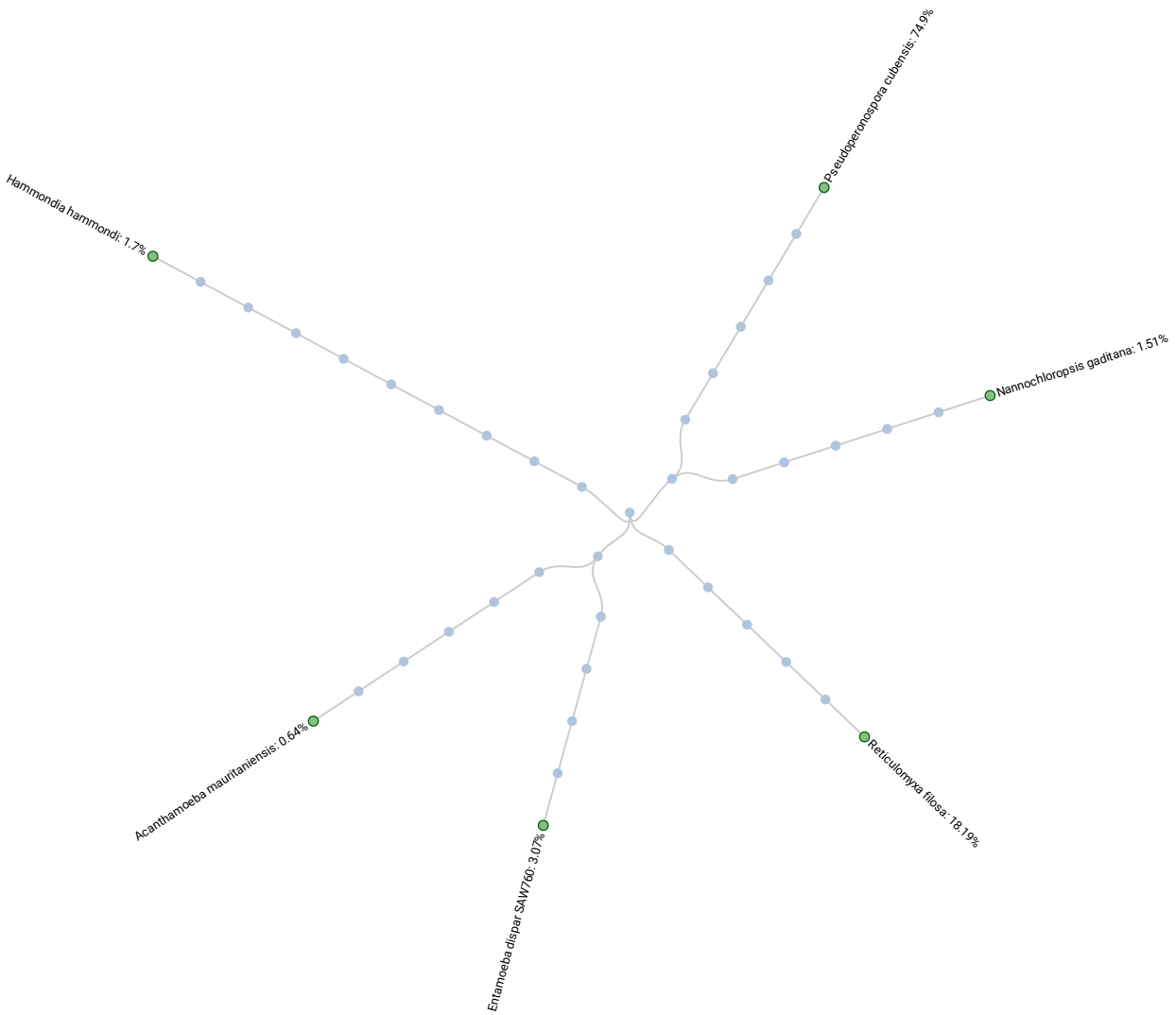
Fasta/q details

Name	Value
Hit	5311

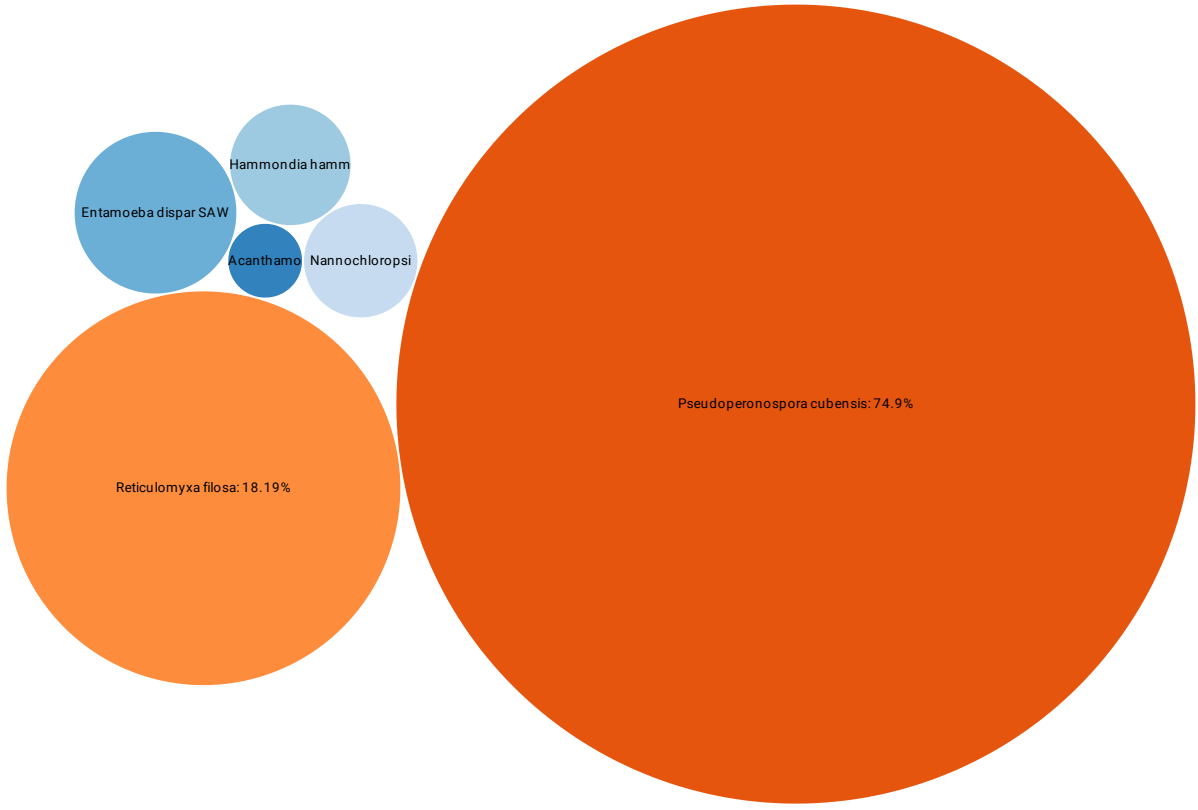
Table

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Pseudoperonospora cubensis	143453	42.25	74.90%	0.29	0.34	2480
Reticulomyxa filosa	46433	10.26	18.19%	0.07	0.09	799
Entamoeba dispar SAW760	370354	1.73	3.07%	0.05	0.04	71
Hammondia hammondi	99158	0.96	1.70%	0.02	0.03	61
Nannochloropsis gaditana	72520	0.85	1.51%	0.02	0.01	41
Acanthamoeba mauritaniensis	196912	0.36	0.64%	0.01	0.02	23


Pseudoperonospora cubensis: 74.9%
Nannochloropsis gaditana: 1.51%
Reticulomyxa filosa: 18.19%
Entamoeba dispar SAW760: 3.07%
Acanthamoeba mauritaniensis: 0.64%
Hammondia hammondi: 1.7%


Pseudoperonospora cubensis: 74.9%
Hammondia hammondi: 1.7%
Nannochloropsis gaditana: 1.51%
Acanthamoeba mauritaniensis: 0.64%
Reticulomyxa filosa: 18.19%
Entamoeba dispar SAW760: 3.07%


Pseudoperonospora cubensis - 74.9%
Pseudop..ubensis
Pseudoperonospora
Peronosporaceae
Peronosporales
Oomycetes
Stramenopiles
1.51% - Nannochloropsis gaditana
Rhizaria
Foraminifera
Monothalamids
Reticulomyxidae
Reticulomyxa
18.19% - Reticulomyxa filosa
E..a
E..r
3.07% - Entamoeba dispar SAW760
1.7% - Hammondia hammondi

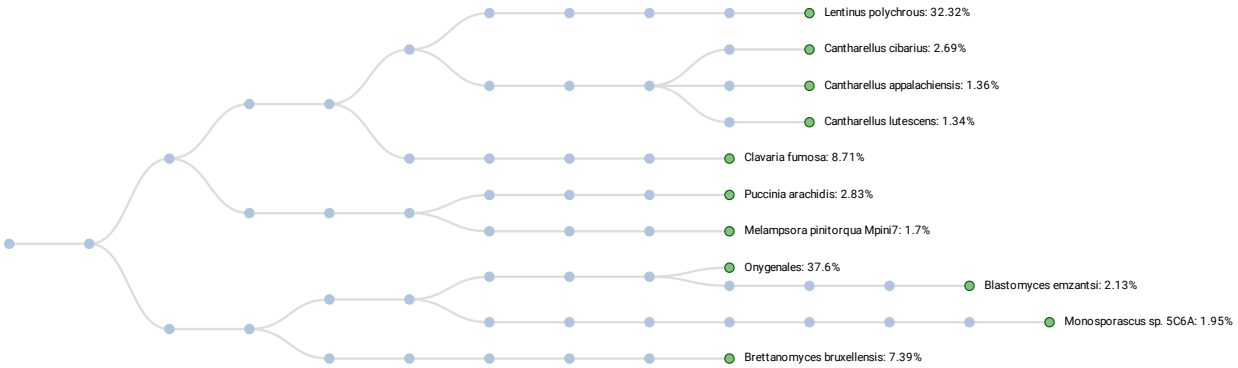

Hammondia hamm
Entamoeba dispar SAW
Acanthamo
Nannochloropsi
Reticulomyxa filosa: 18.19%
Pseudoperonospora cubensis: 74.9%

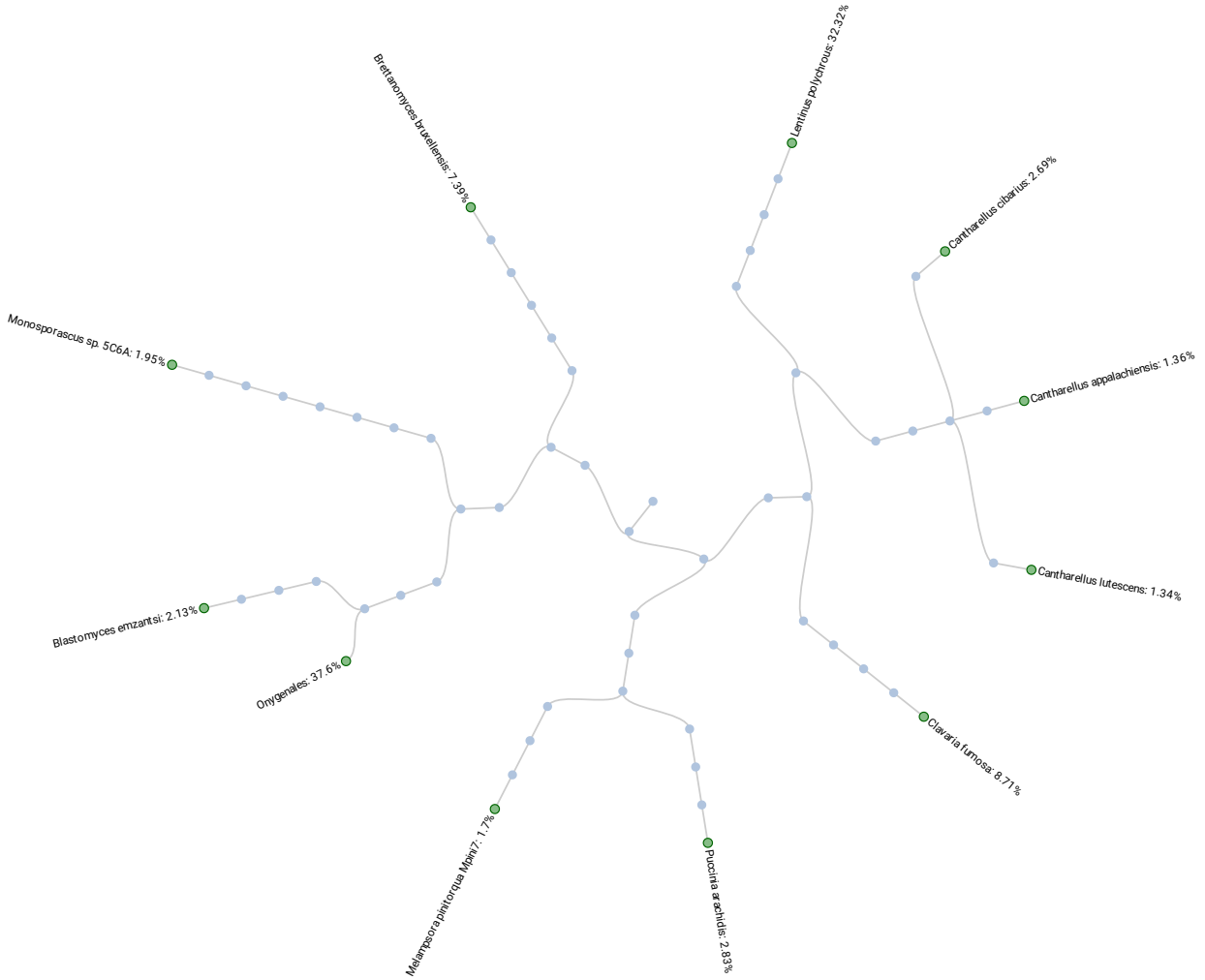
Fasta/q details

Name	Value
Hit	11626

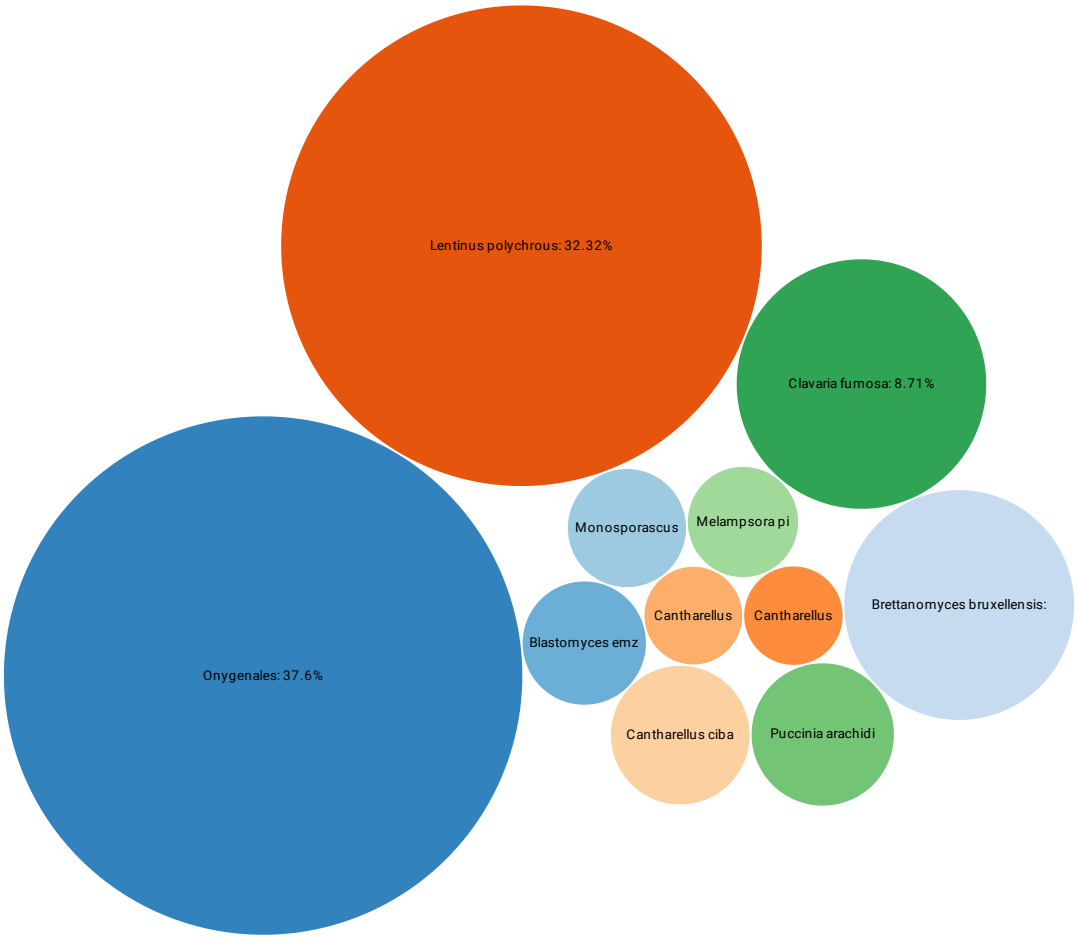
Table

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Onygenales	33183	37.16	37.60%	0.14	0.21	2090
Lentinus polychrous	292559	31.94	32.32%	0.48	0.51	1662
Clavaria fumosa	264083	8.61	8.71%	0.09	0.64	534
Brettanomyces bruxellensis	5007	7.3	7.39%	0.09	0.10	418
Puccinia arachidis	333523	2.8	2.83%	0.05	0.10	136
Cantharellus cibarius	36066	2.66	2.69%	0.05	0.06	135
Blastomyces emzantsi	2723674	2.1	2.13%	0.04	0.03	116
Monosporascus sp. 5C6A	2211642	1.93	1.95%	0.02	0.03	175
Melampsora pinitorqua Mpini7	1298852	1.68	1.70%	0.02	0.03	142
Cantharellus appalachiensis	409893	1.34	1.36%	0.03	0.65	63
Cantharellus lutescens	104198	1.32	1.34%	0.03	0.69	57


Lentinus polychrous: 32.32%
Cantharellus cibarius: 2.69%
Cantharellus appalachiensis: 1.36%
Cantharellus lutescens: 1.34%
Clavaria fumosa: 8.71%
Puccinia arachidis: 2.83%
Melampsora pinitorqua Mpini7: 1.7%
Onygenales: 37.6%
Blastomyces emzantsi: 2.13%
Monosporascus sp. 5C6A: 1.95%
Brettanomyces bruxellensis: 7.39%


Brettanomyces bruxellensis: 7.39%
Lentinus polychrous: 32.32%
Cantharellus cibarius: 2.69%
Monosporascus sp. 5C6A: 1.95%
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Cantharellus lutescens: 1.34%
Blastomyces emzantsi: 2.13%
Onygenales: 37.6%
Clavaria fumosa: 8.71%
Melampsora pinitorqua Mpin7: 1.7%
Puccinia arachidis: 2.83%


Dikarya
Basidiomycota
Agaricomycotina
Agaricomycetes
Agaric..sedis
Polyporales
Polyporaceae
Lentinus
Lentin..chrous
Clavaria
Clavariaceae
Agaricales
Agaric..etidae
Ascomycota
saccharomycetes
leotiomyceta
Pezizomycotina
Eurotiomycetes
Eurotiomycetes
Eurotiomycetes
Onygenales
Eurotiomycetes
Onygenales
Pichiaceae
Brettanomyces
Sacc..tina
Sacc..etes
Sacch..tales
P..s
P..a
P..e
Pu..es
Pu..es
P..a
C..s
Cant..ius
Can..eae
Can..les
Lentinus polychrous - 32.32%
Cantharellus cibarius - 2.69%
Cantharellus appalachiensis - 1.36%
Cantharellus lutescens - 1.34%
Clavaria fumosa - 8.71%
Puccinia arachidis - 2.83%
1.7% - Melampsora pinitorqua Mpini7
37.6% - Onygenales
2.13% - Blastomyces emzantsi
1.95% - Monosporascus sp. 5C6A
7.39% - Brettanomyces bruxellensis


Lentinus polychrous: 32.32%
Clavaria fumosa: 8.71%
Onygenales: 37.6%
Monosporascus
Melampsora pi
Brettanomyces bruxellensis:
Blastomyces emz
Cantharellus
Cantharellus
Cantharellus ciba
Puccinia arachidi

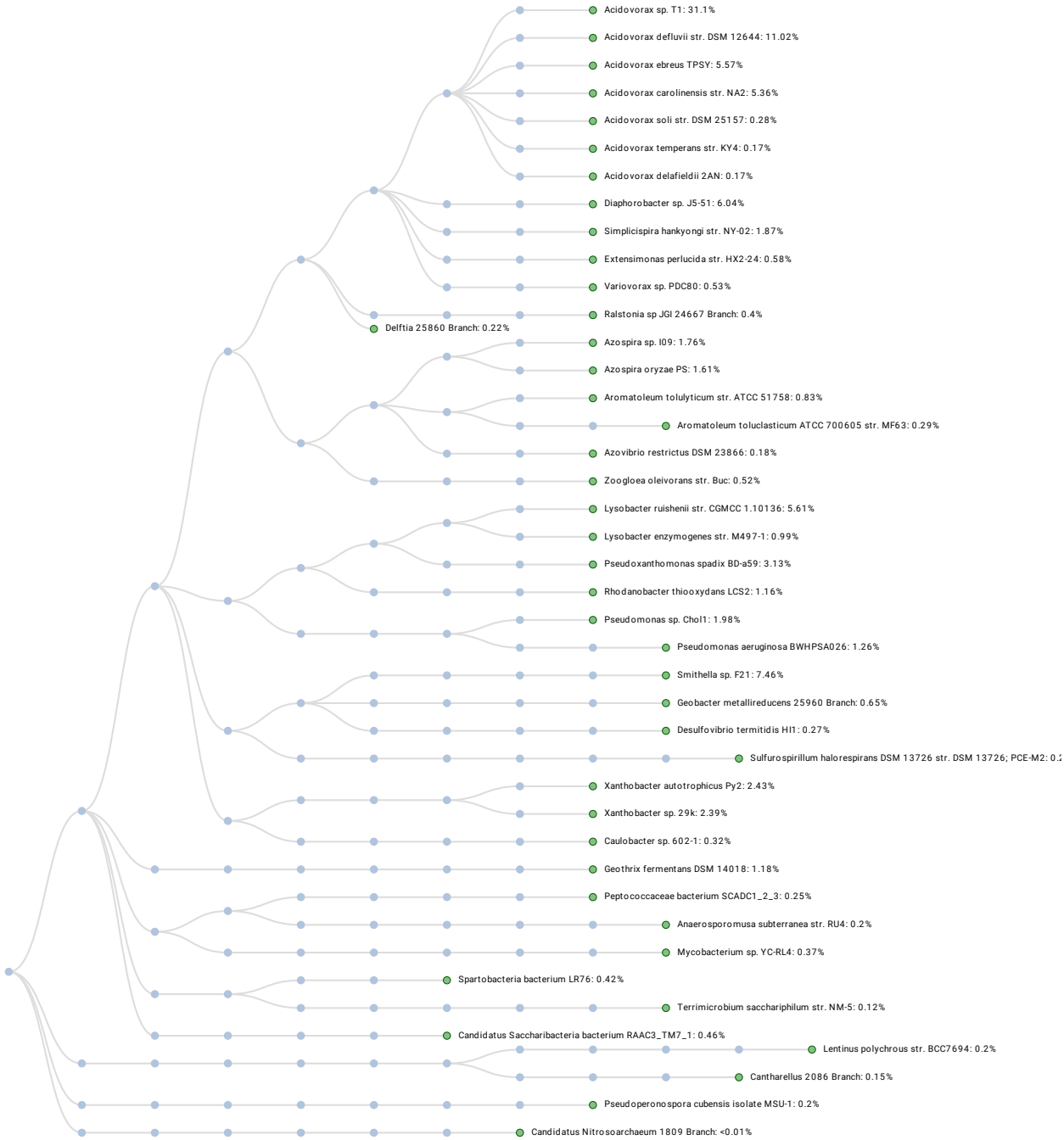
Table

Table

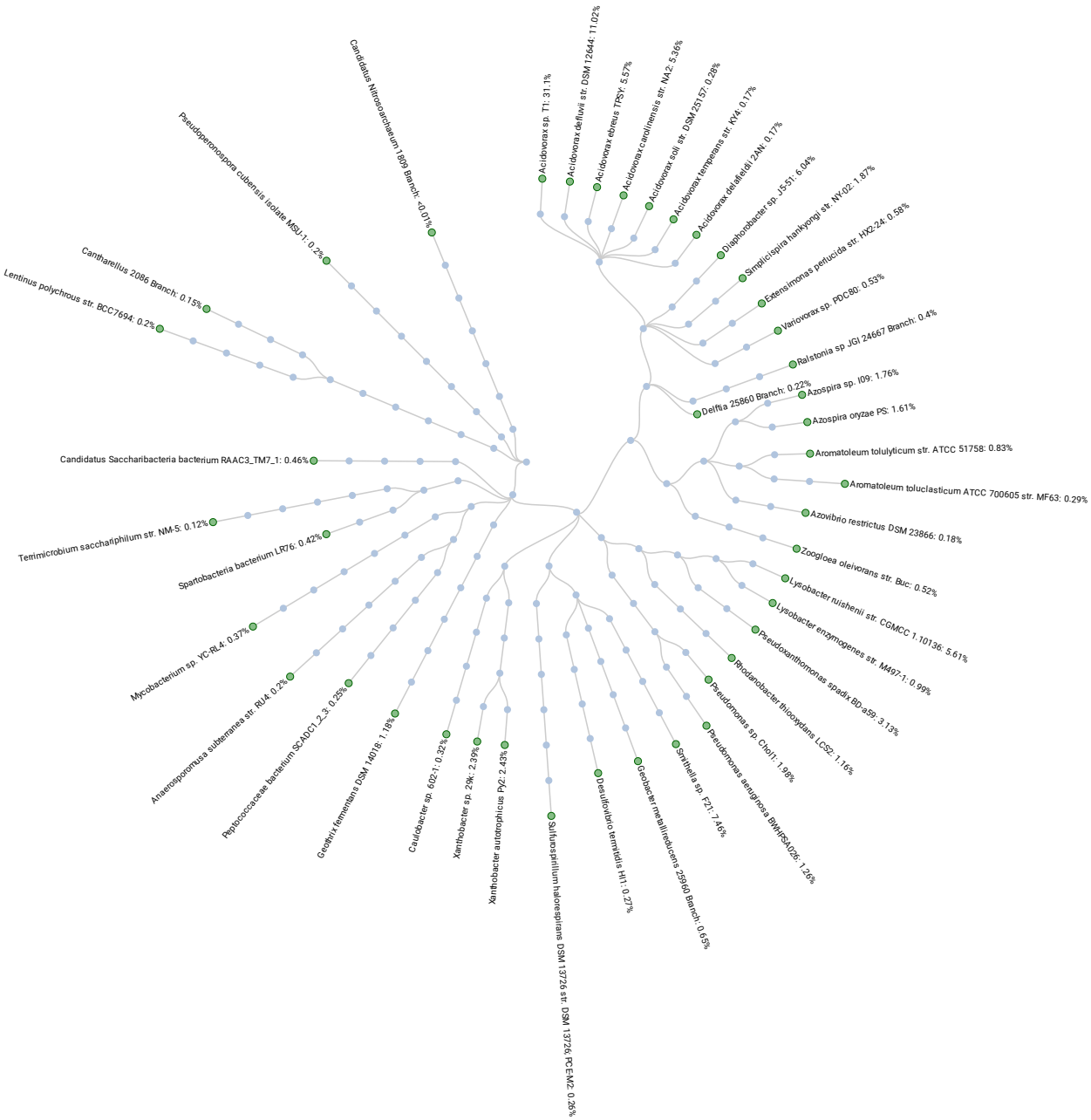
Name	Taxonomy Id	Kingdom	Unified RA	% Unique Matches	% Total Matches
Acidovorax sp. T1	1858609	Bacteria	31.10%	37.86	56.42
Acidovorax defluvii	86669	Bacteria	11.02%	13.12	41.48
Smithella sp. F21	1538640	Bacteria	7.46%	41.26	41.26
Diaphorobacter sp. J5-51	680496	Bacteria	6.04%	6.67	31.36
Lysobacter ruishenii	686800	Bacteria	5.61%	30.82	30.92
Acidovorax ebreus TPSY	535289	Bacteria	5.57%	4.69	29.28
Acidovorax carolinensis	553814	Bacteria	5.36%	5.58	13.90
Pseudoxanthomonas spadix BD-a59	1045855	Bacteria	3.13%	18.86	18.87
Xanthobacter autotrophicus Py2	78245	Bacteria	2.43%	6.85	10.34
Xanthobacter sp. 29k	2607286	Bacteria	2.39%	6.60	10.39
Pseudomonas sp. Chol1	440512	Bacteria	1.98%	8.53	17.98
Simplicispira hankyongi	2315688	Bacteria	1.87%	11.74	11.78
Azospira sp. I09	1765049	Bacteria	1.76%	5.92	11.39
Azospira oryzae PS	640081	Bacteria	1.61%	4.42	10.49
Pseudomonas aeruginosa BWHPSA026	1402526	Bacteria	1.26%	20.05	5.67
Geothrix fermentans DSM 14018	1121920	Bacteria	1.18%	7.82	7.82
Rhodanobacter thiooxydans LCS2	1163409	Bacteria	1.16%	7.60	7.69
Lysobacter enzymogenes	69	Bacteria	0.99%	6.03	6.49
Aromatoleum tolulyticum	34027	Bacteria	0.83%	4.85	5.56
Geobacter metallireducens	28232	Bacteria	0.65%	4.50	4.54
Extensimonas perlucida	2590786	Bacteria	0.58%	4.13	4.11
Variovorax sp. PDC80	1882827	Bacteria	0.53%	2.77	3.62
Zoogloea oleivorans	1552750	Bacteria	0.52%	3.35	3.63
Candidatus Saccharibacteria bacterium RAAC3_TM7_1	1394711	Bacteria	0.46%	4.01	4.01
Spartobacteria bacterium LR76	2161866	Bacteria	0.42%	2.13	2.90
unclassified Ralstonia	209769	Bacteria	0.40%	7.51	7.51
Mycobacterium sp. YC-RL4	1682113	Bacteria	0.37%	2.74	2.75
Caulobacter sp. 602-1	2492472	Bacteria	0.32%	1.88	2.35
Aromatoleum toluclasticum ATCC 700605	1261621	Bacteria	0.29%	1.54	2.13
Acidovorax soli	592050	Bacteria	0.28%	0.99	1.68
Desulfovibrio termitidis HI1	644897	Bacteria	0.27%	1.87	2.06
Sulfurospirillum halorespirans DSM 13726	1193502	Bacteria	0.26%	1.81	2.25
Peptococcaceae bacterium SCADC1_2_3	1487582	Bacteria	0.25%	2.24	2.24

Name	Taxonomy Id	Kingdom	Unified RA	% Unique Matches	% Total Matches
Burkholderiales	80840	Bacteria	0.22%	5.83	5.83
Pseudoperonospora cubensis	143453	Protists	0.20%	0.29	0.34
Lentinus polychrous	292559	Fungi	0.20%	0.48	0.51
Anaerosporomusa subterranea	1794912	Bacteria	0.20%	1.65	1.65
Azovibrio restrictus DSM 23866	1121035	Bacteria	0.18%	0.91	0.94
Acidovorax temperans	80878	Bacteria	0.17%	0.80	0.83
Acidovorax delafieldii 2AN	573060	Bacteria	0.17%	0.67	0.75
Cantharellus	36065	Fungi	0.15%	1.77	1.77
Terrimicrobium sacchariphilum	690879	Bacteria	0.12%	0.96	1.80
Nitrosarchaeum	1007082	Archaea	<0.01%	5.30	5.30

Tree Chart

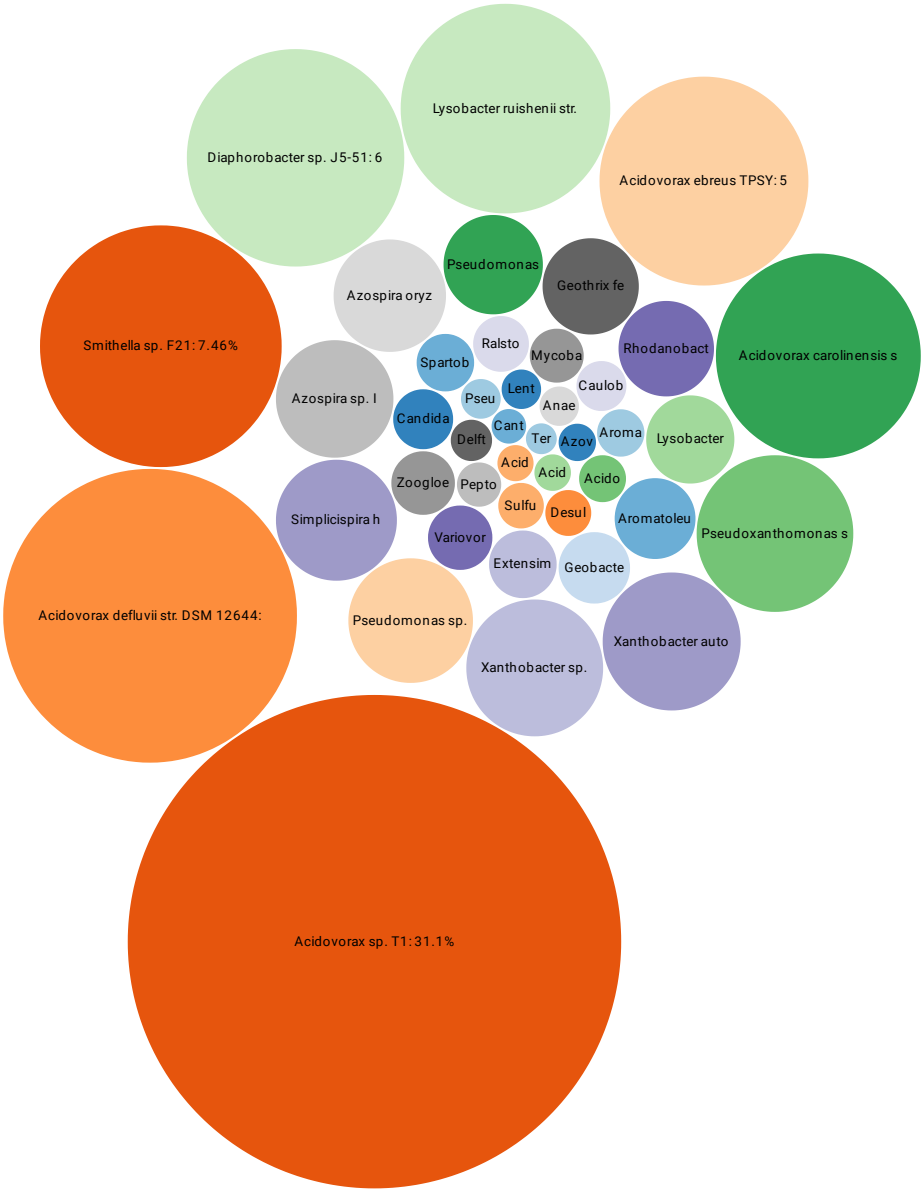

Acidovorax sp. T1: 31.1%
Acidovorax defluvii str. DSM 12644: 11.02%
Acidovorax ebreus TPSY: 5.57%
Acidovorax carolinensis str. NA2: 5.36%
Acidovorax soli str. DSM 25157: 0.28%
Acidovorax temperans str. KY4: 0.17%
Acidovorax delafieldii 2AN: 0.17%
Diaphorobacter sp. J5-51: 6.04%
Simplicispira hankyongi str. NY-02: 1.87%
Extensimonas perlucida str. HX2-24: 0.58%
Variovorax sp. PDC80: 0.53%
Ralstonia sp JGI 24667 Branch: 0.4%
Delftia 25860 Branch: 0.22%
Azospira sp. I09: 1.76%
Azospira oryzae PS: 1.61%
Aromatoleum tolulyticum str. ATCC 51758: 0.83%
Aromatoleum toluclasticum ATCC 700605 str. MF63: 0.29%
Azovibrio restrictus DSM 23866: 0.18%
Zoogloea oleivorans str. Buc: 0.52%
Lysobacter ruishenii str. CGMCC 1.10136: 5.61%
Lysobacter enzymogenes str. M497-1: 0.99%
Pseudoxanthomonas spadix BD-a59: 3.13%
Rhodanobacter thiooxydans LCS2: 1.16%
Pseudomonas sp. Chol1: 1.98%
Pseudomonas aeruginosa BWHPSA026: 1.26%
Smithella sp. F21: 7.46%
Geobacter metallireducens 25960 Branch: 0.65%
Desulfovibrio termitidis HI1: 0.27%
Sulfurospirillum halorespirans DSM 13726 str. DSM 13726; PCE-M2: 0.
Xanthobacter autotrophicus Py2: 2.43%
Xanthobacter sp. 29k: 2.39%
Caulobacter sp. 602-1: 0.32%
Geothrix fermentans DSM 14018: 1.18%
Peptococcaceae bacterium SCADC1_2_3: 0.25%
Anaerosporomusa subterranea str. RU4: 0.2%
Mycobacterium sp. YC-RL4: 0.37%
Spartobacteria bacterium LR76: 0.42%
Terrimicrobium sacchariphilum str. NM-5: 0.12%
Candidatus Saccharibacteria bacterium RAAC3_TM7_1: 0.46%
Lentinus polychrous str. BCC7694: 0.2%
Cantharellus 2086 Branch: 0.15%
Pseudoperonospora cubensis isolate MSU-1: 0.2%
Candidatus Nitrosoarchaeum 1809 Branch: <0.01%

Radial Tree Chart



Sunburst Chart




Lysobacter ruishenii str.
Diaphorobacter sp. J5-51: 6
Acidovorax ebreus TPSY: 5
Pseudomonas
Geothrix fe
Azospira oryz
Smithella sp. F21: 7.46%
Acidovorax carolinensis s
Rhodanobact
Ralsto
Mycoba
Spartob
Azospira sp. I
Lent
Caulob
Pseu
Anae
Candida
Cant
Aroma
Lysobacter
Delft
Ter
Azov
Acid
Acid
Acido
Zoogloe
Pepto
Sulfu
Desul
Simplicispira h
Aromatoleu
Pseudoxanthomonas s
Variovor
Extensim
Geobacte
Acidovorax defluvii str. DSM 12644:
Pseudomonas sp.
Xanthobacter auto
Xanthobacter sp.
Acidovorax sp. T1: 31.1%

Fasta/q details

Name	Value
Hit	132

Table

Name	Accession ID	Class	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Aminoglycoside GENE aadA1 1 X02340	X02340	Aminoglycoside	2127.73	100.00%	35.94	10.36	399

Fasta/q details

Name	Value
Hit	2893

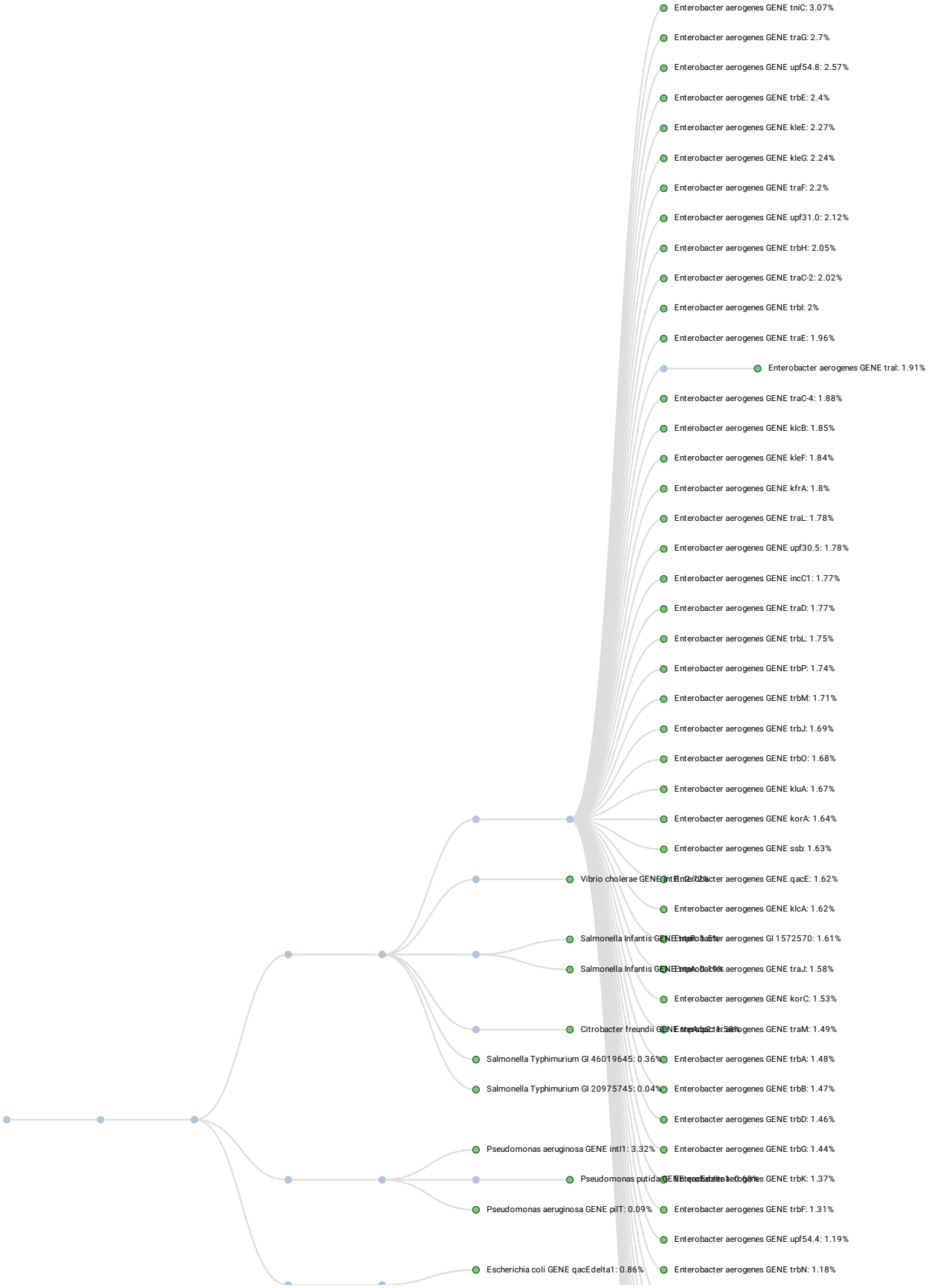
Table

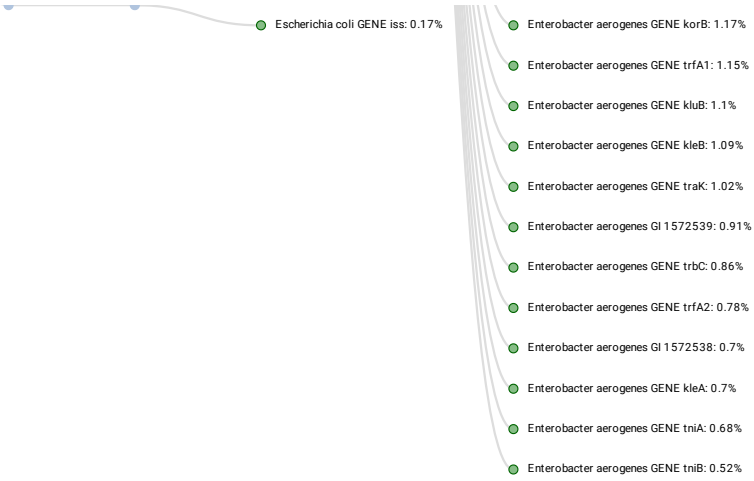
Name	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Pseudomonas aeruginosa GENE intI1	21799.14	3.32%	100.00	100.00	789
Enterobacter aerogenes GENE tniC	20213.42	3.07%	100.00	100.00	2060
Vibrio cholerae GENE intI1	17898.16	2.72%	100.00	100.00	223
Enterobacter aerogenes GENE traG	17748.41	2.70%	100.00	100.00	3784
Enterobacter aerogenes GENE upf54.8	16881.27	2.57%	100.00	100.00	985
Enterobacter aerogenes GENE trbE	15753.67	2.40%	94.08	94.08	5122
Enterobacter aerogenes GENE kleE	14912.42	2.27%	100.00	100.00	628
Enterobacter aerogenes GENE kleG	14755.43	2.24%	100.00	100.00	605
Enterobacter aerogenes GENE traF	14442.92	2.20%	94.30	94.30	1262
Enterobacter aerogenes GENE upf31.0	13943.32	2.12%	100.00	100.00	1029
Enterobacter aerogenes GENE trbH	13447.79	2.05%	90.68	90.68	933
Enterobacter aerogenes GENE traC-2	13291.81	2.02%	92.77	92.77	1189
Enterobacter aerogenes GENE trbI	13157.6	2.00%	89.46	89.46	2440
Enterobacter aerogenes GENE traE	12865.01	1.96%	88.25	88.25	3186
Enterobacter aerogenes GENE traI	12528.7	1.91%	94.06	94.95	2499
Enterobacter aerogenes GENE traC-4	12388.45	1.88%	90.09	90.09	2426
Enterobacter aerogenes GENE klcB	12158.71	1.85%	97.55	97.55	1557
Enterobacter aerogenes GENE kleF	12127.75	1.84%	86.57	86.57	540

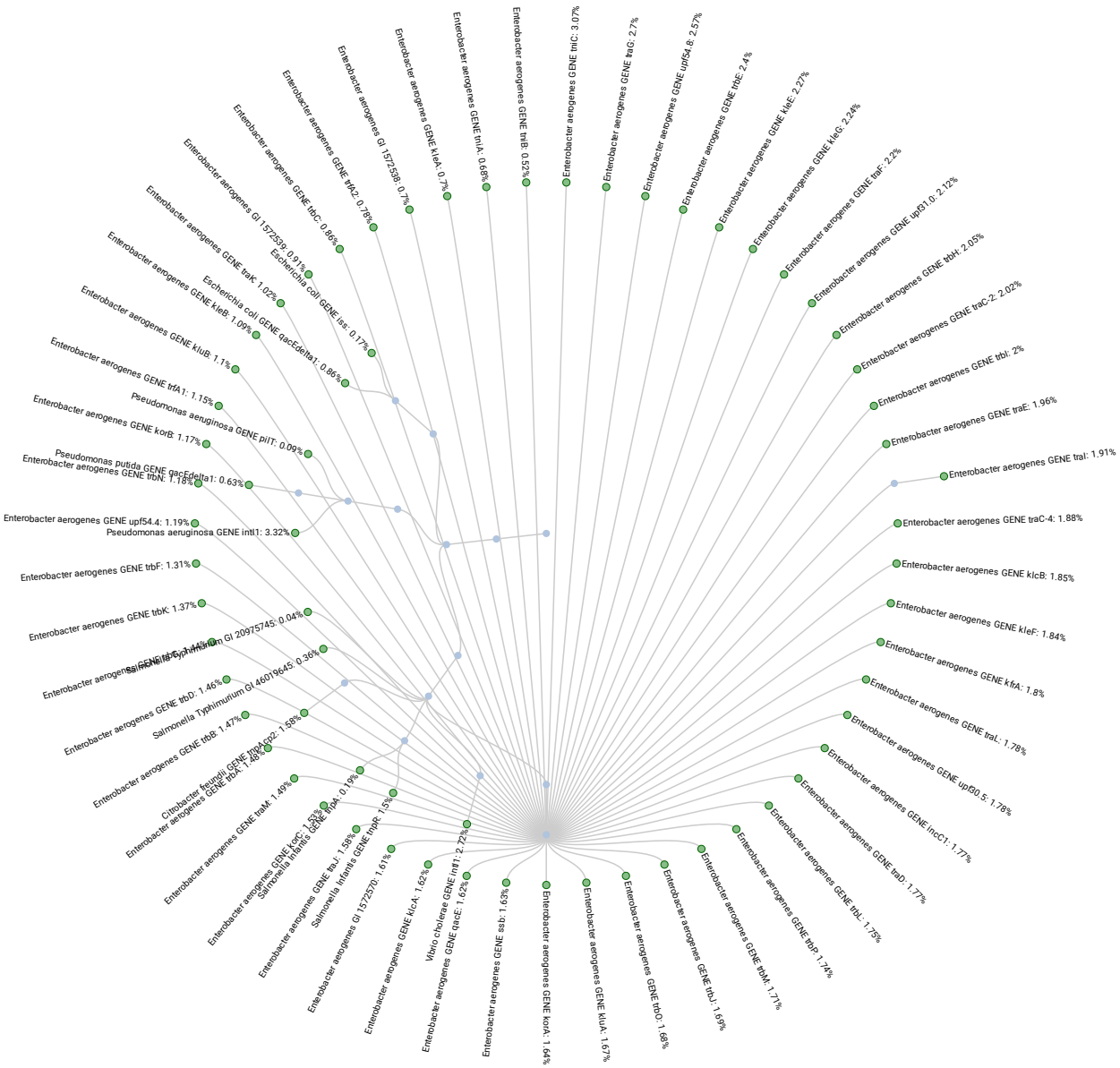
Name	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Enterobacter aerogenes GENE kfrA	11853	1.80%	94.85	94.85	1306
Enterobacter aerogenes GENE traL	11725.97	1.78%	94.57	94.57	1237
Enterobacter aerogenes GENE upf30.5	11697.04	1.78%	95.33	95.33	704
Enterobacter aerogenes GENE incC1	11658.82	1.77%	100.00	100.00	1215
Enterobacter aerogenes GENE traD	11640.59	1.77%	100.00	100.00	551
Enterobacter aerogenes GENE trbL	11505.93	1.75%	90.80	90.80	1757
Enterobacter aerogenes GENE trbP	11417.11	1.74%	97.01	97.01	1087
Enterobacter aerogenes GENE trbM	11262.87	1.71%	100.00	100.00	729
Enterobacter aerogenes GENE trbJ	11116.98	1.69%	84.33	84.33	1217
Enterobacter aerogenes GENE trbO	11054.56	1.68%	100.00	100.00	509
Enterobacter aerogenes GENE kluA	11007.07	1.67%	100.00	100.00	506
Enterobacter aerogenes GENE korA	10801.79	1.64%	100.00	100.00	529
Enterobacter aerogenes GENE ssb	10724.35	1.63%	100.00	100.00	567
Enterobacter aerogenes GENE qacE	10667.13	1.62%	100.00	100.00	157
Enterobacter aerogenes GENE klcA	10661.42	1.62%	100.00	100.00	558
Enterobacter aerogenes GI 1572570	10603.41	1.61%	89.97	89.97	1633
Citrobacter freundii GENE tnpAcp2	10414.12	1.58%	71.32	71.32	2017
Enterobacter aerogenes GENE traJ	10367.49	1.58%	100.00	100.00	560
Enterobacter aerogenes GENE korC	10082.48	1.53%	95.45	95.45	401
Salmonella Infantis GENE tnpR	9838.86	1.50%	79.00	79.00	591
Enterobacter aerogenes GENE traM	9792.71	1.49%	100.00	100.00	444

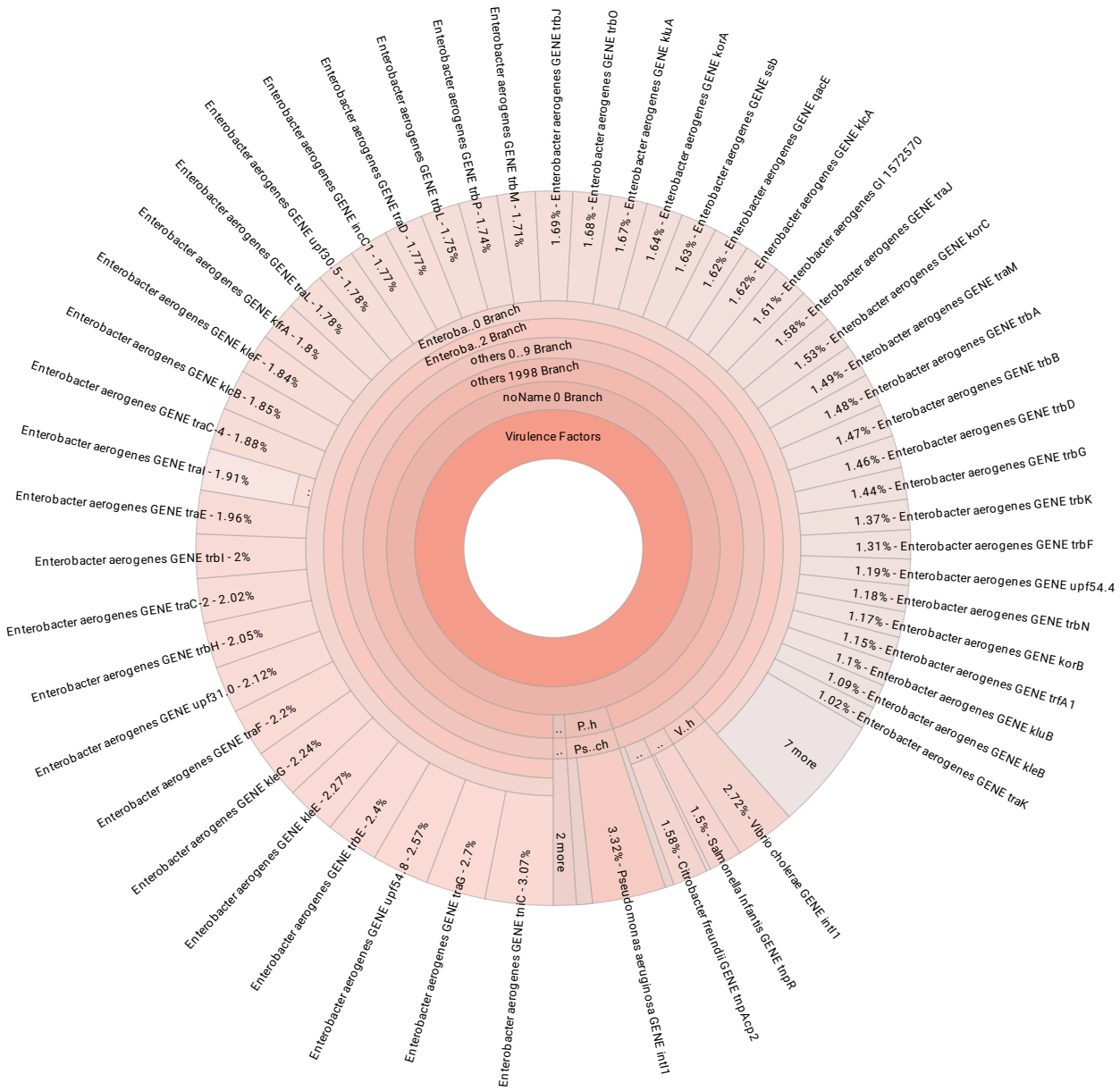
Name	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Enterobacter aerogenes GENE trbA	9721.55	1.48%	100.00	100.00	505
Enterobacter aerogenes GENE trbB	9664.55	1.47%	91.19	91.19	1175
Enterobacter aerogenes GENE trbD	9571.12	1.46%	88.46	88.46	443
Enterobacter aerogenes GENE trbG	9455.2	1.44%	80.97	80.97	1024
Enterobacter aerogenes GENE trbK	9014.76	1.37%	81.97	81.97	357
Enterobacter aerogenes GENE trbF	8621.4	1.31%	95.05	95.05	656
Enterobacter aerogenes GENE upf54.4	7831.93	1.19%	90.00	90.00	490
Enterobacter aerogenes GENE trbN	7780.83	1.18%	90.00	90.00	508
Enterobacter aerogenes GENE korB	7660.93	1.17%	75.76	75.76	875
Enterobacter aerogenes GENE trfA1	7574.71	1.15%	89.29	89.29	329
Enterobacter aerogenes GENE kluB	7201	1.10%	80.95	80.95	331
Enterobacter aerogenes GENE kleB	7148.45	1.09%	100.00	100.00	220
Enterobacter aerogenes GENE traK	6724.57	1.02%	84.95	84.95	304
Enterobacter aerogenes GI 1572539	6000.08	0.91%	100.00	100.00	89
Escherichia coli GENE qacEdelta1	5671.43	0.86%	100.00	100.00	105
Enterobacter aerogenes GENE trbC	5666.34	0.86%	65.63	65.63	300
Enterobacter aerogenes GENE trfA2	5163.23	0.78%	68.21	68.21	364
Enterobacter aerogenes GI 1572538	4622.66	0.70%	100.00	100.00	51
Enterobacter aerogenes GENE kleA	4613.42	0.70%	82.76	82.76	116
Enterobacter aerogenes GENE tniA	4438.66	0.68%	47.88	47.88	794
Pseudomonas putida GENE qacEdelta1	4121.94	0.63%	100.00	100.00	28

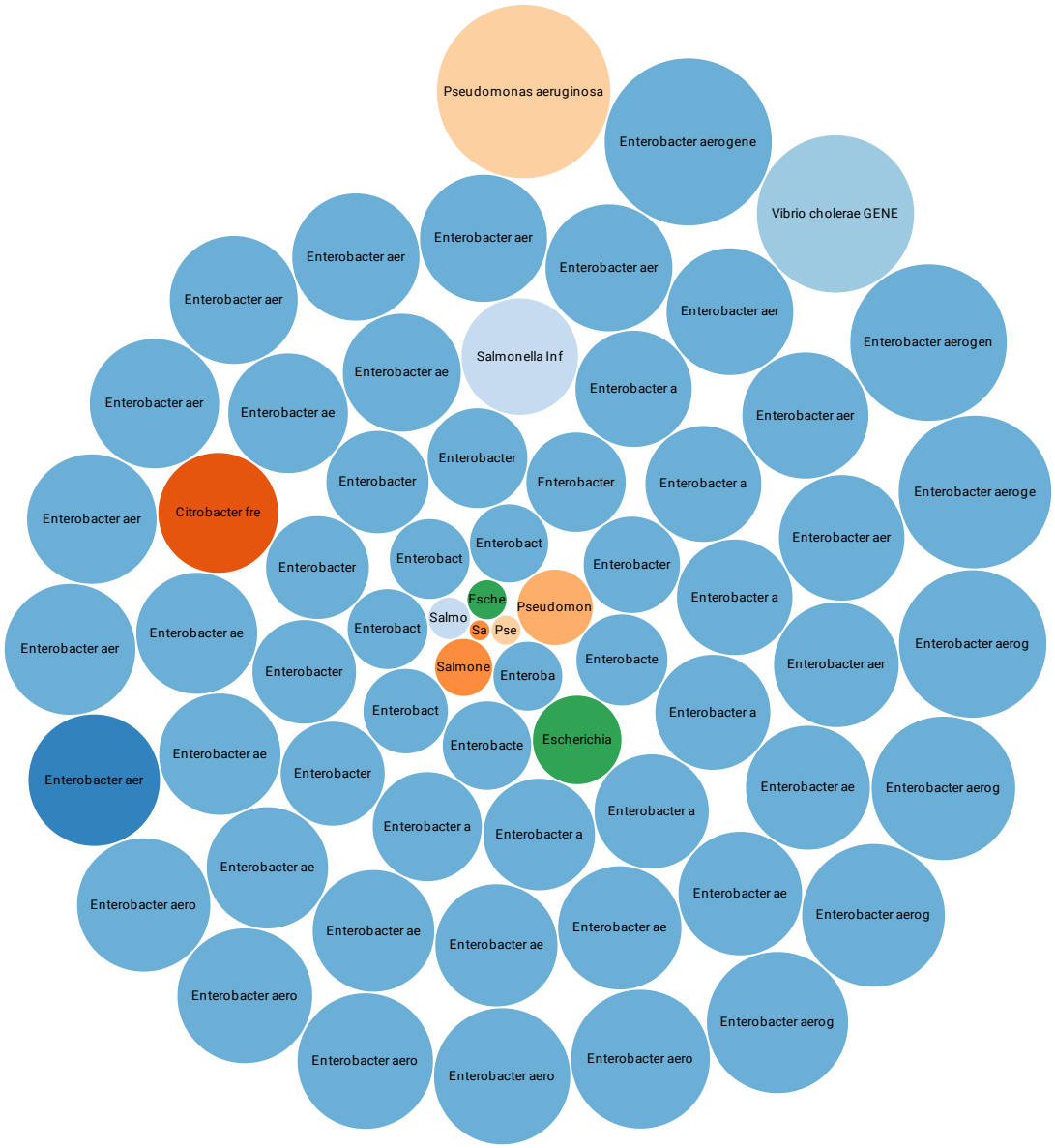
Name	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Enterobacter aerogenes GENE tniB	3432.27	0.52%	41.29	41.29	341
Salmonella Typhimurium GI 46019645	2355.24	0.36%	33.62	33.62	308
Salmonella Infantis GENE tnpA	1244.64	0.19%	15.03	15.03	142
Escherichia coli GENE iss	1101.72	0.17%	18.01	18.01	194
Pseudomonas aeruginosa GENE pilT	611.88	0.09%	13.57	13.57	63
Salmonella Typhimurium GI 20975745	289.15	0.04%	10.61	10.61	13


Enterobacter aerogenes GENE tniC: 3.07%
Enterobacter aerogenes GENE traG: 2.7%
Enterobacter aerogenes GENE upf54.8: 2.57%
Enterobacter aerogenes GENE trbE: 2.4%
Enterobacter aerogenes GENE kleE: 2.27%
Enterobacter aerogenes GENE kleG: 2.24%
Enterobacter aerogenes GENE traF: 2.2%
Enterobacter aerogenes GENE upf31.0: 2.12%
Enterobacter aerogenes GENE trbH: 2.05%
Enterobacter aerogenes GENE traC-2: 2.02%
Enterobacter aerogenes GENE trbI: 2%
Enterobacter aerogenes GENE traE: 1.96%
Enterobacter aerogenes GENE traI: 1.91%
Enterobacter aerogenes GENE traC-4: 1.88%
Enterobacter aerogenes GENE klcB: 1.85%
Enterobacter aerogenes GENE kleF: 1.84%
Enterobacter aerogenes GENE kfrA: 1.8%
Enterobacter aerogenes GENE traL: 1.78%
Enterobacter aerogenes GENE upf30.5: 1.78%
Enterobacter aerogenes GENE incC1: 1.77%
Enterobacter aerogenes GENE traD: 1.77%
Enterobacter aerogenes GENE trbL: 1.75%
Enterobacter aerogenes GENE trbP: 1.74%
Enterobacter aerogenes GENE trbM: 1.71%
Enterobacter aerogenes GENE trbJ: 1.69%
Enterobacter aerogenes GENE trbO: 1.68%
Enterobacter aerogenes GENE kluA: 1.67%
Enterobacter aerogenes GENE korA: 1.64%
Enterobacter aerogenes GENE ssb: 1.63%
Enterobacter aerogenes GENE qacE: 1.62%
Enterobacter aerogenes GENE klcA: 1.62%
Enterobacter aerogenes GI 1572570: 1.61%
Enterobacter aerogenes GENE traJ: 1.58%
Enterobacter aerogenes GENE korC: 1.53%
Enterobacter aerogenes GENE traM: 1.49%
Enterobacter aerogenes GENE trbA: 1.48%
Enterobacter aerogenes GENE trbB: 1.47%
Enterobacter aerogenes GENE trbD: 1.46%
Enterobacter aerogenes GENE trbG: 1.44%
Enterobacter aerogenes GENE trbK: 1.37%
Enterobacter aerogenes GENE trbF: 1.31%
Enterobacter aerogenes GENE upf54.4: 1.19%
Enterobacter aerogenes GENE trbN: 1.18%
Vibrio cholerae GENE intI1: 2.72%
Salmonella Infantis GENE intI1: 0.19%
Citrobacter freundii GENE intI1: 1.58%
Salmonella Typhimurium GI 46019645: 0.36%
Salmonella Typhimurium GI 20975745: 0.04%
Pseudomonas aeruginosa GENE intI1: 3.32%
Pseudomonas putida GENE intI1: 0.68%
Pseudomonas aeruginosa GENE pilT: 0.09%
Escherichia coli GENE qacEdelta1: 0.86%


Escherichia coli GENE iss: 0.17%
Enterobacter aerogenes GENE korB: 1.17%
Enterobacter aerogenes GENE trfA1: 1.15%
Enterobacter aerogenes GENE kluB: 1.1%
Enterobacter aerogenes GENE kleB: 1.09%
Enterobacter aerogenes GENE traK: 1.02%
Enterobacter aerogenes GI 1572539: 0.91%
Enterobacter aerogenes GENE trbC: 0.86%
Enterobacter aerogenes GENE trfA2: 0.78%
Enterobacter aerogenes GI 1572538: 0.7%
Enterobacter aerogenes GENE kleA: 0.7%
Enterobacter aerogenes GENE tniA: 0.68%
Enterobacter aerogenes GENE tniB: 0.52%


Enterobacter aerogenes GENE traJ: 1.58%
Salmonella Infantis GENE traA: 0.19%
Enterobacter aerogenes GENE traM: 1.49%
Enterobacter aerogenes GENE traA2: 1.48%
Citrobacter freundii GENE traA2: 1.58%
Salmonella Typhimurium GI 46019645: 0.36%
Enterobacter aerogenes GENE trbD: 1.46%
Salmonella Typhimurium GI 20975745: 0.04%
Enterobacter aerogenes GENE trbK: 1.37%
Enterobacter aerogenes GENE trbF: 1.31%
Pseudomonas aeruginosa GENE intI1: 3.32%
Enterobacter aerogenes GENE upf54.4: 1.19%
Enterobacter aerogenes GENE trbN: 1.18%
Pseudomonas putida GENE gacEdelta1: 0.63%
Pseudomonas aeruginosa GENE pilT: 0.09%
Enterobacter aerogenes GENE korB: 1.17%
Enterobacter aerogenes GENE trfA1: 1.15%
Enterobacter aerogenes GENE kluB: 1.1%
Escherichia coli GENE gacEdelta1: 0.86%
Enterobacter aerogenes GENE kleB: 1.09%
Escherichia coli GENE ise: 0.17%
Enterobacter aerogenes GENE traK: 1.02%
Enterobacter aerogenes GI 1572539: 0.91%
Enterobacter aerogenes GENE trbC: 0.86%
Enterobacter aerogenes GENE trfA2: 0.78%
Enterobacter aerogenes GI 1572558: 0.7%
Enterobacter aerogenes GENE kleA: 0.7%
Enterobacter aerogenes GENE trfA: 0.68%
Enterobacter aerogenes GENE traB: 0.52%
Enterobacter aerogenes GENE traC: 3.07%
Enterobacter aerogenes GENE traG: 2.7%
Enterobacter aerogenes GENE upf54.8: 2.57%
Enterobacter aerogenes GENE trbE: 2.4%
Enterobacter aerogenes GENE kleE: 2.27%
Enterobacter aerogenes GENE klcG: 2.24%
Enterobacter aerogenes GENE traF: 2.2%
Enterobacter aerogenes GENE upf31.0: 2.12%
Enterobacter aerogenes GENE trbH: 2.05%
Enterobacter aerogenes GENE traC-2: 2.02%
Enterobacter aerogenes GENE trbI: 2%
Enterobacter aerogenes GENE traE: 1.96%
Enterobacter aerogenes GENE traI: 1.91%
Enterobacter aerogenes GENE traC-4: 1.88%
Enterobacter aerogenes GENE klcB: 1.85%
Enterobacter aerogenes GENE kleF: 1.84%
Enterobacter aerogenes GENE klfA: 1.8%
Enterobacter aerogenes GENE traL: 1.78%
Enterobacter aerogenes GENE upf60.5: 1.78%
Enterobacter aerogenes GENE incC1: 1.77%
Enterobacter aerogenes GENE traD: 1.77%
Enterobacter aerogenes GENE trbL: 1.75%
Enterobacter aerogenes GENE trbP: 1.74%
Enterobacter aerogenes GENE trbM: 1.71%
Enterobacter aerogenes GENE trbJ: 1.69%
Enterobacter aerogenes GENE trbO: 1.68%
Enterobacter aerogenes GENE kluA: 1.67%
Enterobacter aerogenes GENE korA: 1.64%
Enterobacter aerogenes GENE ssb: 1.63%
Enterobacter aerogenes GENE traC6: 1.62%
Vibrio cholerae GENE intI1: 2.72%
Enterobacter aerogenes GENE klcA: 1.62%
Enterobacter aerogenes GI 1572570: 1.61%
Salmonella Infantis GENE traR: 1.5%
Enterobacter aerogenes GENE traJ: 1.58%
Salmonella Infantis GENE korC: 1.53%


Virulence Factors
noName 0 Branch
others 1998 Branch
others 0...9 Branch
Enteroba...2 Branch
Enteroba...0 Branch
1.69% - Enterobacter aerogenes GENE trbJ
1.68% - Enterobacter aerogenes GENE trbO
1.67% - Enterobacter aerogenes GENE kluA
1.64% - Enterobacter aerogenes GENE korA
1.63% - Enterobacter aerogenes GENE ssb
1.62% - Enterobacter aerogenes GENE qacE
1.62% - Enterobacter aerogenes GENE klcA
1.61% - Enterobacter aerogenes GI 1572570
1.58% - Enterobacter aerogenes GENE traJ
1.53% - Enterobacter aerogenes GENE korC
1.49% - Enterobacter aerogenes GENE traM
1.48% - Enterobacter aerogenes GENE trbA
1.47% - Enterobacter aerogenes GENE trbB
1.46% - Enterobacter aerogenes GENE trbD
1.44% - Enterobacter aerogenes GENE trbG
1.37% - Enterobacter aerogenes GENE trbK
1.31% - Enterobacter aerogenes GENE trbF
1.19% - Enterobacter aerogenes GENE upf54.4
1.18% - Enterobacter aerogenes GENE trbN
1.17% - Enterobacter aerogenes GENE korB
1.15% - Enterobacter aerogenes GENE trfA1
1.1% - Enterobacter aerogenes GENE kluB
1.09% - Enterobacter aerogenes GENE kleB
1.02% - Enterobacter aerogenes GENE traK
7 more
2.72% - Vibrio cholerae GENE intI1
1.5% - Salmonella Infantis GENE tnpR
1.58% - Citrobacter freundii GENE tnpA-cp2
3.32% - Pseudomonas aeruginosa GENE intI1
2 more
Enterobacter aerogenes GENE tnIC - 3.07%
Enterobacter aerogenes GENE traG - 2.7%
Enterobacter aerogenes GENE upf54.8 - 2.57%
Enterobacter aerogenes GENE trbE - 2.4%
Enterobacter aerogenes GENE kleE - 2.27%
Enterobacter aerogenes GENE kleG - 2.24%
Enterobacter aerogenes GENE traF - 2.2%
Enterobacter aerogenes GENE upf31.0 - 2.12%
Enterobacter aerogenes GENE trbH - 2.05%
Enterobacter aerogenes GENE traC-2 - 2.02%
Enterobacter aerogenes GENE trbI - 2%
Enterobacter aerogenes GENE traE - 1.96%
Enterobacter aerogenes GENE traI - 1.91%
Enterobacter aerogenes GENE traC-4 - 1.88%
Enterobacter aerogenes GENE klcB - 1.85%
Enterobacter aerogenes GENE kleF - 1.84%
Enterobacter aerogenes GENE kfrA - 1.8%
Enterobacter aerogenes GENE traL - 1.78%
Enterobacter aerogenes GENE upf30.5 - 1.78%
Enterobacter aerogenes GENE incCI1 - 1.77%
Enterobacter aerogenes GENE traD - 1.77%
Enterobacter aerogenes GENE trbL - 1.75%
Enterobacter aerogenes GENE trbP - 1.74%
Enterobacter aerogenes GENE trbM - 1.71%

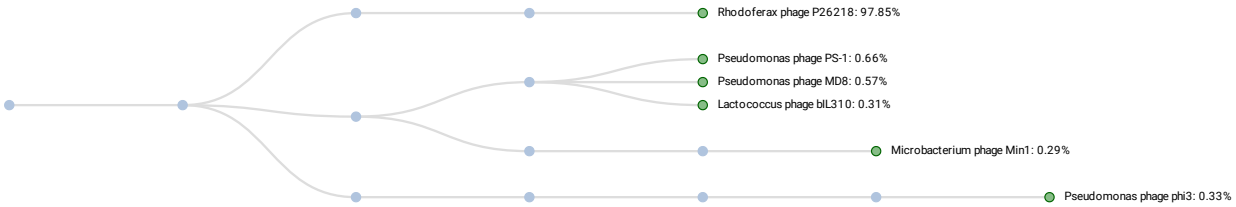

Pseudomonas aeruginosa
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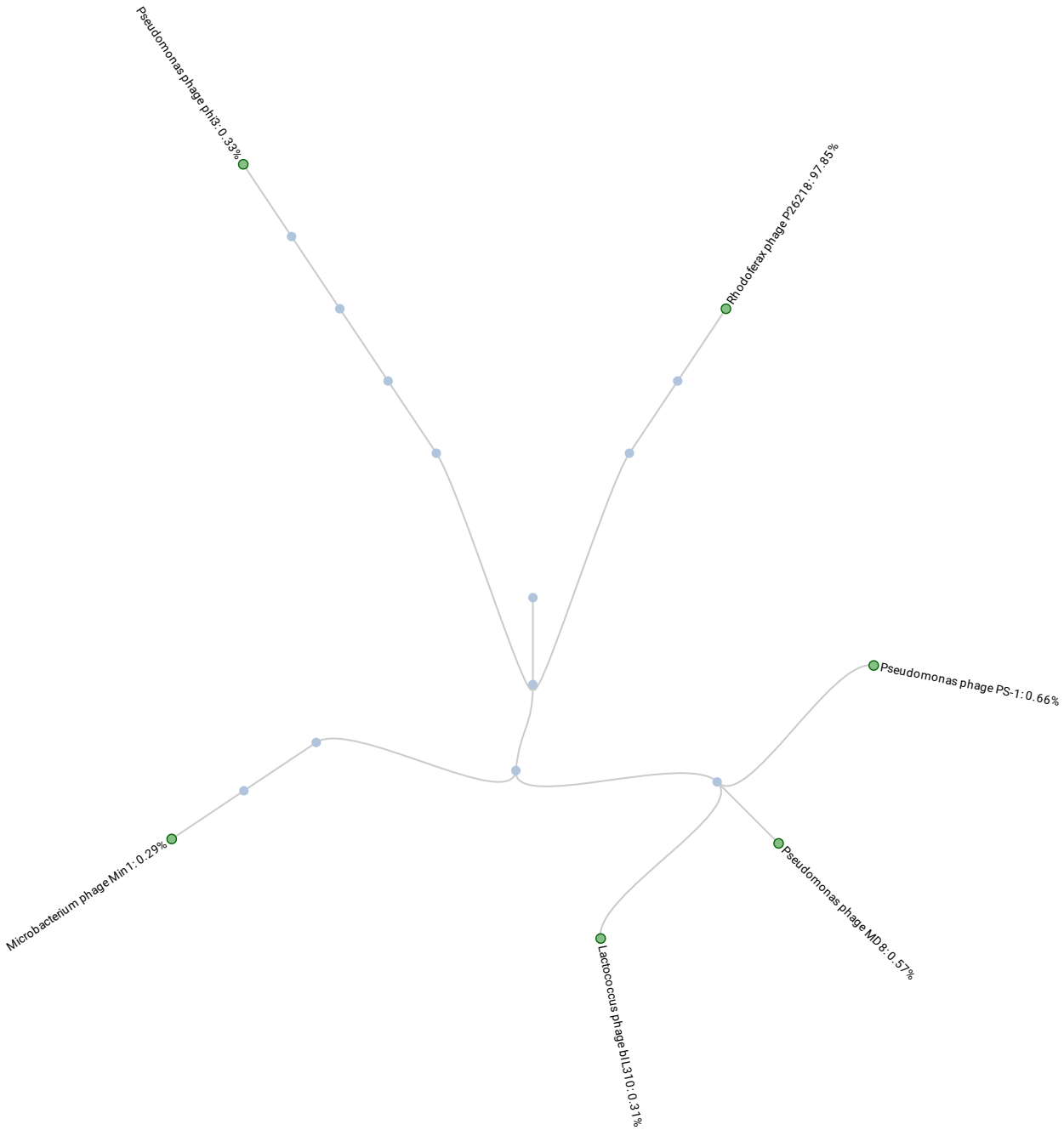
Fasta/q details

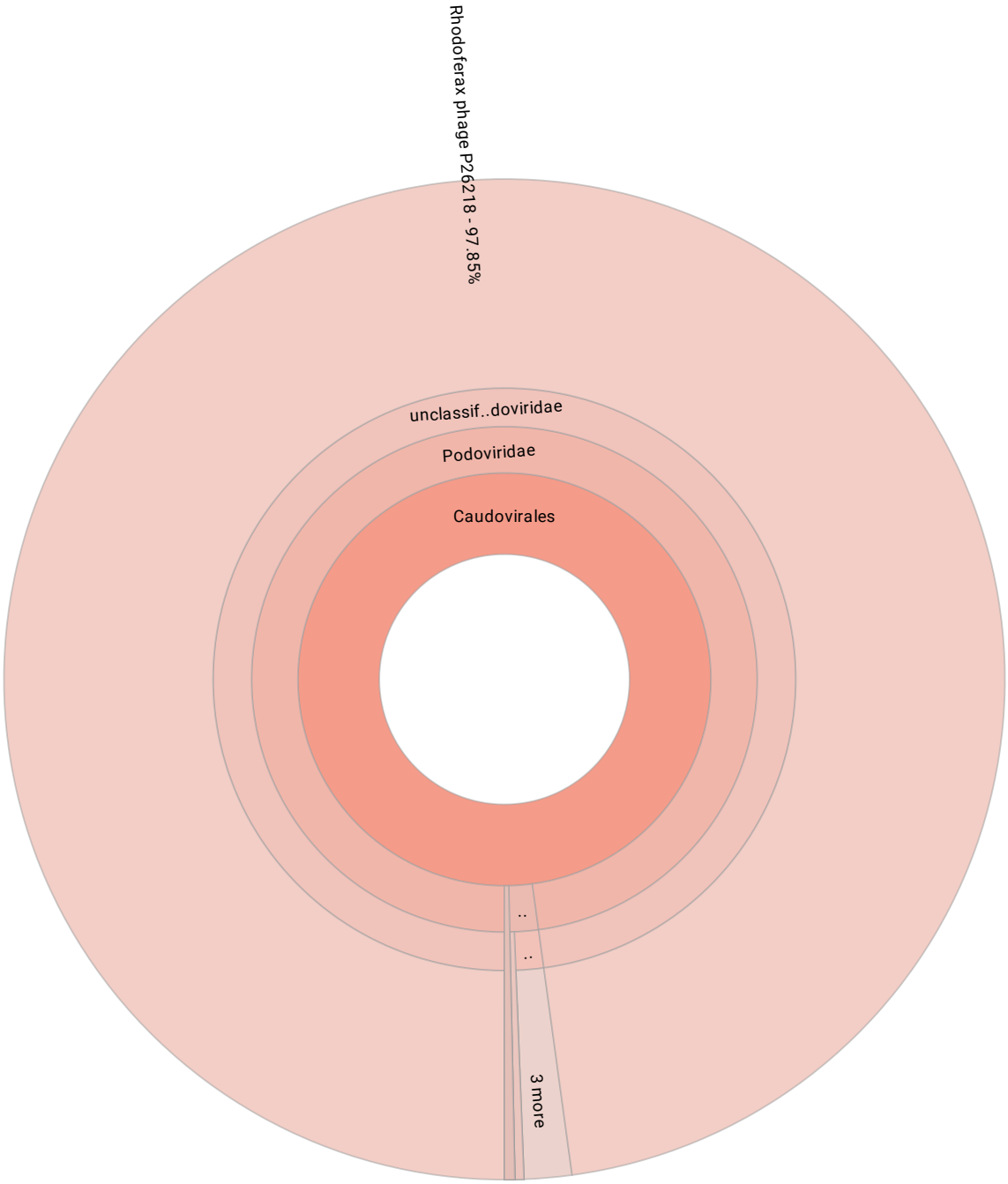
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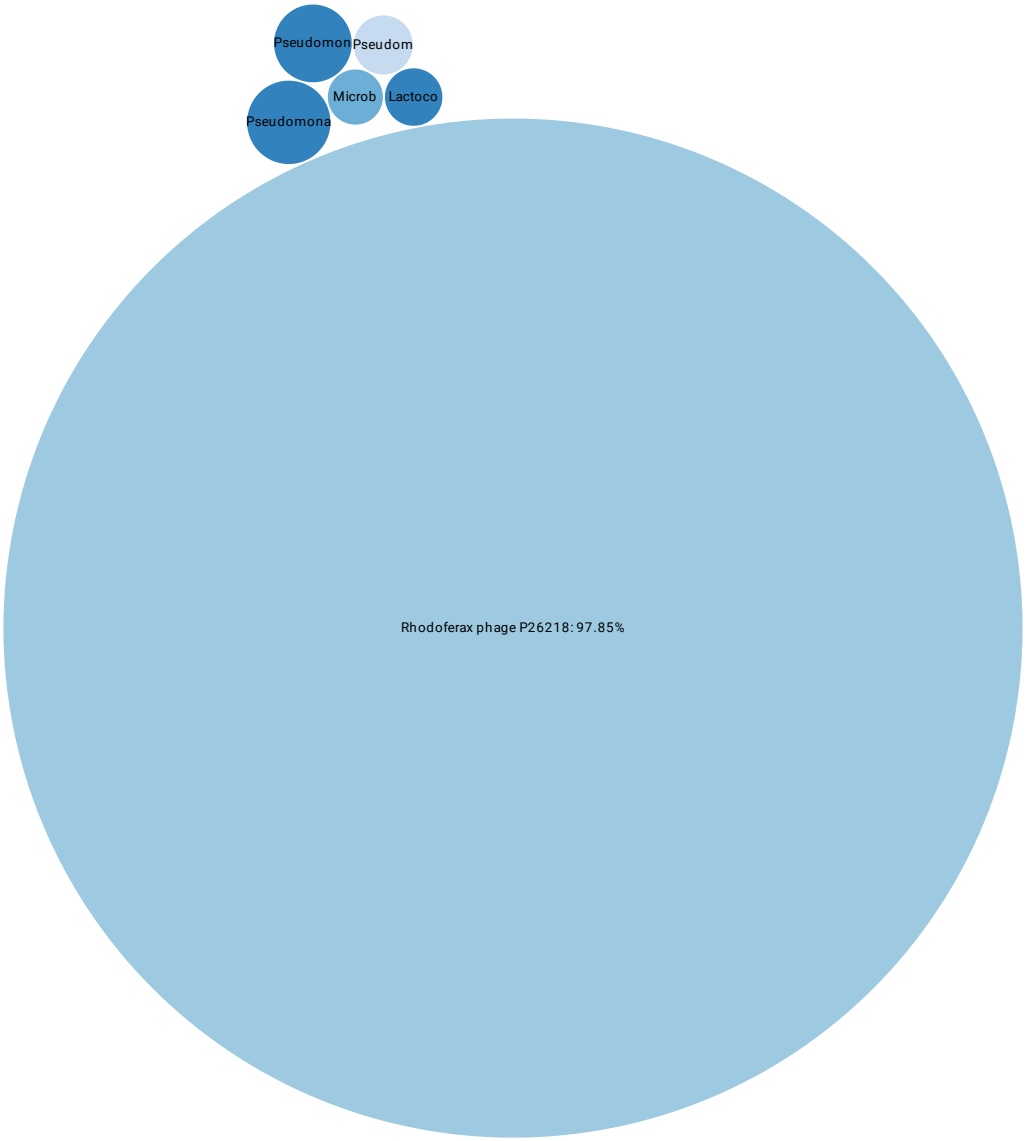
Table

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Rhodoferax phage P26218	1636270	994.13	97.85%	7.34	7.34	4953
Pseudomonas phage PS-1	1573458	6.65	0.66%	0.18	0.18	32
Pseudomonas phage MD8	1868596	5.78	0.57%	0.18	0.12	19
Pseudomonas phage phi3	1754217	3.34	0.33%	0.12	0.12	61
Lactococcus phage bIL310	151538	3.16	0.31%	0.13	0.12	20
Microbacterium phage Min1	446529	2.91	0.29%	0.10	0.10	30


Rhodoferax phage P26218: 97.85%
Pseudomonas phage PS-1: 0.66%
Pseudomonas phage MD8: 0.57%
Lactococcus phage bIL310: 0.31%
Microbacterium phage Min1: 0.29%
Pseudomonas phage phi3: 0.33%


Pseudomonas phage phi3: 0.33%
Rhodoferax phage P26218: 97.85%
Pseudomonas phage PS-1: 0.66%
Microbacterium phage Min1: 0.29%
Pseudomonas phage MD8: 0.57%
Lactococcus phage bIL310: 0.31%


Rhodoferax phage P26218 - 97.85%
unclassif..doviridae
Podoviridae
Caudovirales
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..
3 more


Pseudomon
Pseudom
Microb
Lactoco
Pseudomona
Rhodoferax phage P26218: 97.85%

Fasta/q details

Name	Value
Hit	357969

Table

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Spirochaetaceae bacterium UBA6243	1952898	8138.14	19.37%	69.37	87.35	9771
Spirochaetaceae bacterium UBA6809	1952899	7528.69	17.92%	63.42	85.83	12488
Syntrophaceae bacterium	2052184	4140.7	9.86%	36.06	52.45	7067
Acidovorax delafieldii	47920	3245.14	7.72%	11.29	11.36	67935
Alicycliphilus sp. UBA880	1946006	2781.22	6.62%	19.64	31.00	12834
Paludibacter sp. UBA5753	1947025	2595.4	6.18%	22.36	41.16	2340
Anaerolineaceae bacterium UBA5211	1951422	1631.15	3.88%	16.49	16.49	11007
Spirochaetaceae bacterium	1898206	953.54	2.27%	10.48	10.47	5833
Alphaproteobacteria bacterium UBA7691	1948445	782.39	1.86%	7.98	7.98	9096
Proteiniphilum sp. UBA6247	1947288	671.11	1.60%	8.80	12.57	547
Pseudomonas stutzeri	316	641.39	1.53%	5.20	5.19	697
Desulfovibrio sp. UBA6121	1961409	561.52	1.34%	6.09	6.09	6448
Pseudomonas sp.	306	524.47	1.25%	3.16	3.03	4352
Candidatus Collierbacteria bacterium	2053540	503.62	1.20%	5.22	7.26	22
Spirochaetaceae bacterium UBA5556	1952892	440.39	1.05%	1.36	4.06	1960
Acidovorax sp.	1872122	399.8	0.95%	1.66	1.84	19945
Comamonadaceae bacterium UBA6202	1951611	396.06	0.94%	3.86	3.90	6849
Geobacter sp. UBA4050	1961391	393.89	0.94%	5.36	5.54	82
Comamonadaceae bacterium	1871071	328.68	0.78%	1.98	2.21	8917
Candidatus Saccharibacteria bacterium	2026720	305.34	0.73%	4.19	4.19	1044
Syntrophaceae bacterium UBA5612	1961441	254.24	0.61%	4.06	4.86	195
Anaerolineaceae bacterium UBA4781	1951412	210.26	0.50%	2.89	2.89	966

Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Syntrophaceae bacterium UBA4797	1961436	203.74	0.49%	2.28	4.76	249
Candidatus Aminicenantes bacterium UBA4085	1953194	202.94	0.48%	2.43	2.43	2875
Spirochaetaceae bacterium UBA6089	1952897	192.32	0.46%	2.22	2.58	368
Elusimicrobia bacterium	2030800	153.38	0.37%	1.95	2.84	467
Holophagaceae bacterium	2052165	153.38	0.37%	1.92	1.92	1625
unclassified Smithella	2625943	140.24	0.33%	0.40	0.38	226
Porphyromonadaceae bacterium	2049046	134.43	0.32%	2.10	1.94	23
candidate division WWE3 bacterium	2053526	129.7	0.31%	3.64	3.54	68
Catabacter sp. UBA7703	1946300	126.61	0.30%	1.60	1.60	1860
Syntrophaceae bacterium UBA2192	1961422	122.55	0.29%	1.07	4.55	137
Anaerolineaceae bacterium	2024896	116.69	0.28%	1.72	1.72	642
Syntrophaceae bacterium UBA5606	1961440	111.44	0.27%	1.24	1.51	55
Firmicutes bacterium UBA6155	1948089	101.27	0.24%	1.67	2.18	166
Betaproteobacteria bacterium UBA2592	1948455	95.91	0.23%	0.84	0.84	1976
Patescibacteria group bacterium UBA6102	1948843	94.97	0.23%	1.49	1.55	300
unclassified Spirochaetaceae	38780	92.86	0.22%	1.30	1.30	571
Syntrophaceae bacterium UBA6255	1961454	92.59	0.22%	1.22	1.22	1094
Microbacterium sp.	51671	85	0.20%	1.09	1.09	1216
Syntrophaceae bacterium UBA4059	1961430	81.6	0.19%	1.09	1.10	966
Desulfotomaculum sp.	41211	78.41	0.19%	1.60	2.24	60
Firmicutes bacterium UBA4061	1948001	76	0.18%	1.43	2.32	36
Comamonadaceae bacterium UBA4184	1951606	74.16	0.18%	0.53	0.43	3256
Gallionellaceae bacterium UBA2239	1953084	73.76	0.18%	0.56	0.56	2394
Pseudomonas kunmingensis	1211807	64.01	0.15%	1.02	0.87	236
unclassified Sulfurospirillum	2618290	59.01	0.14%	0.48	0.48	270

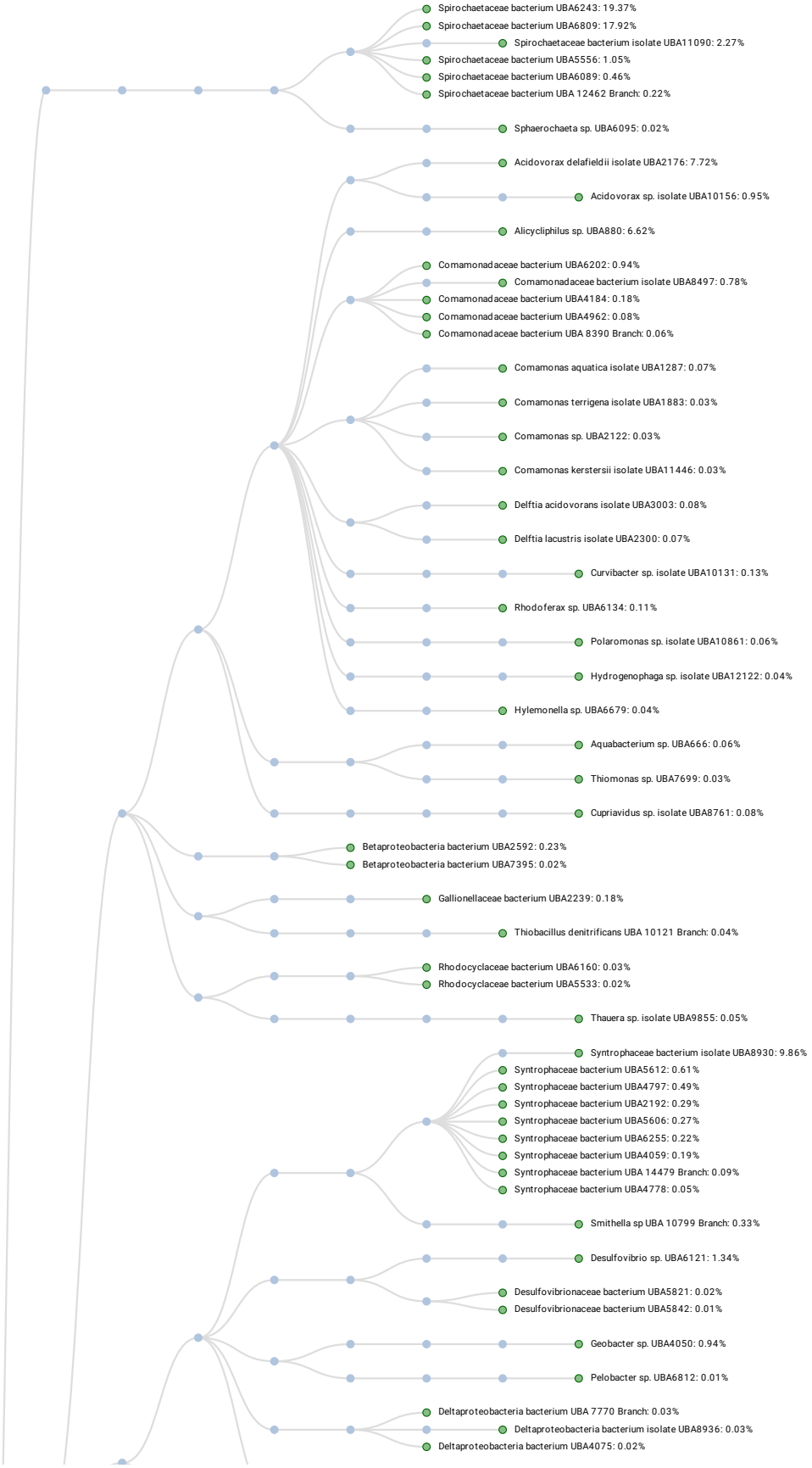
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Mageeibacillus sp. UBA5747	1946798	55.85	0.13%	0.88	0.88	435
Curvibacter sp.	1888168	54.49	0.13%	0.54	0.55	1738
Methanoregula sp. UBA64	1915554	54.5	0.13%	0.42	0.42	1591
Rhodoferax sp. UBA6134	1947380	45.32	0.11%	0.48	0.48	904
unclassified Methanoregula	2649730	40.91	0.10%	0.11	0.08	55
Caulobacter vibrioides	155892	40.3	0.10%	0.56	0.56	934
unclassified Syntrophaceae	1510979	37.81	0.09%	0.35	0.25	192
unclassified Microbacteriaceae	90316	36.26	0.09%	0.14	0.17	276
unclassified Patescibacteria group	1948766	35.89	0.08%	0.19	0.19	11
Cupriavidus sp.	1873897	32.32	0.08%	0.41	0.35	167
Comamonadaceae bacterium UBA4962	1951608	31.95	0.08%	0.22	0.23	2001
Delftia acidovorans	80866	31.83	0.08%	0.29	0.94	1251
Janibacter	53457	31.49	0.08%	1.42	1.42	6
Comamonas aquatica	225991	29.36	0.07%	0.26	0.27	1067
Cyanobacteria bacterium UBA2320	1947875	29.13	0.07%	0.12	0.12	1348
unclassified Rhodanobacteraceae	1850978	28.22	0.07%	1.22	1.22	4
unclassified Bradyrhizobium	2631580	27.84	0.07%	0.41	0.41	135
Delftia lacustris	558537	27.21	0.07%	0.26	0.91	1022
Polaromonas sp.	1869339	26.7	0.06%	0.15	0.10	172
Caldiserica bacterium UBA6126	1953182	27.05	0.06%	0.51	0.51	148
Stenotrophomonas sp. UBA1867	1947547	25.33	0.06%	0.46	0.24	137
unclassified Comamonadaceae	83494	23.8	0.06%	0.13	0.13	252
Pseudomonas aeruginosa group	136841	24.03	0.06%	0.34	0.34	3
Aquabacterium sp. UBA666	1946043	23.68	0.06%	0.43	0.25	1533
Anaerolineaceae bacterium UBA6105	1951439	23.13	0.06%	0.43	0.43	279
Acetobacterium sp. UBA6819	1945908	22.56	0.05%	0.37	0.37	269
Patescibacteria group bacterium UBA5272	1948830	21.92	0.05%	0.80	2.09	13
Syntrophaceae bacterium UBA4778	1961434	20.94	0.05%	0.31	0.31	344

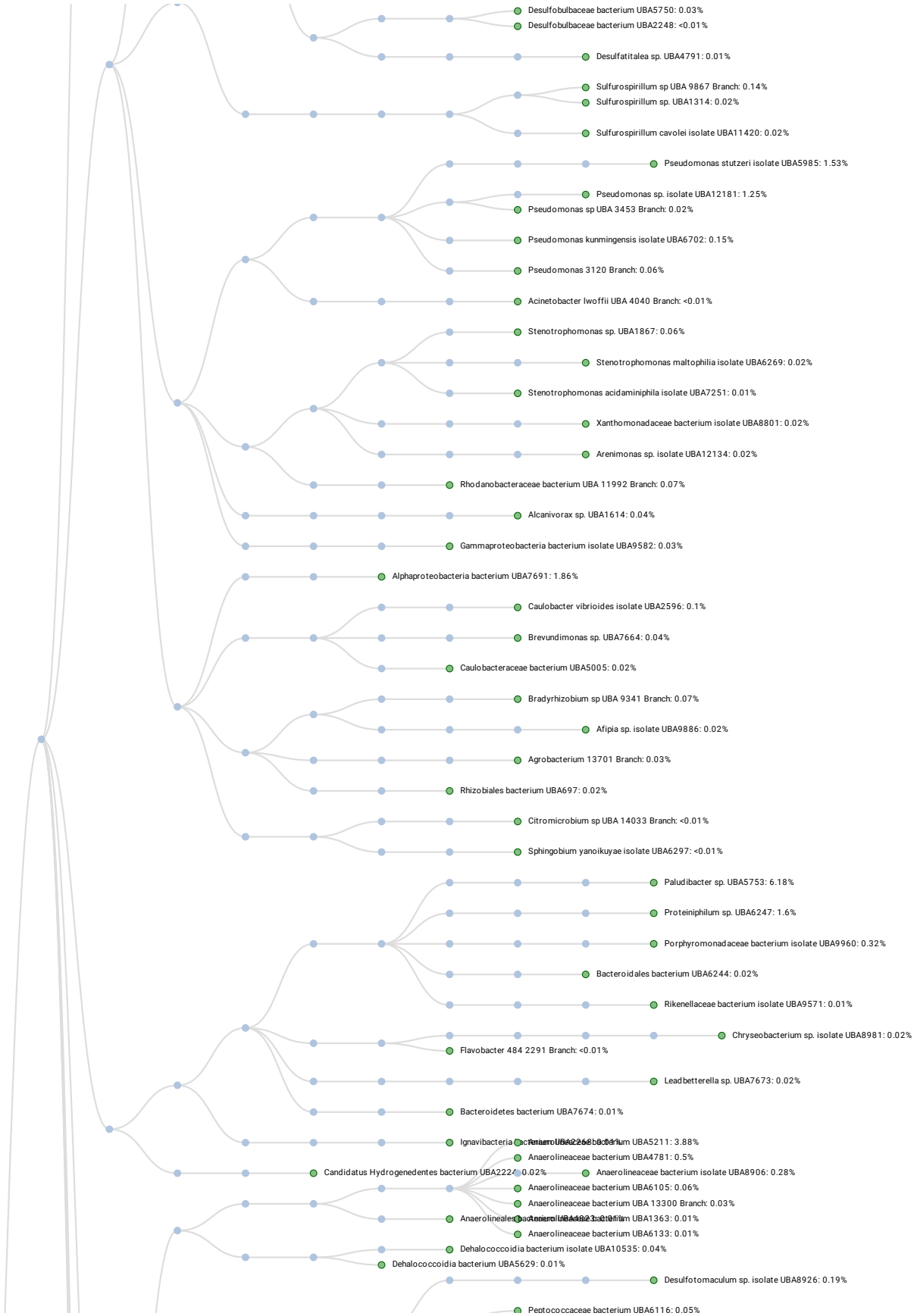
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Peptococcaceae bacterium UBA6116	1952719	21.03	0.05%	0.42	0.42	118
Cutibacterium acnes	1747	19.29	0.05%	0.56	0.36	25
Thauera sp.	1905334	18.92	0.05%	0.18	0.19	767
Hydrogenophaga sp.	1904254	18.57	0.04%	0.22	0.35	116
Brevundimonas sp. UBA7664	1946141	18.43	0.04%	0.30	0.43	326
Pelotomaculum sp. UBA4789	1947067	18.61	0.04%	0.37	0.37	118
Thiobacillus denitrificans	36861	17.95	0.04%	3.03	3.03	25
Alcanivorax sp. UBA1614	1945971	17.46	0.04%	1.20	0.67	11
Dehalococcoidia bacterium	2026734	16.59	0.04%	0.36	0.36	79
Microbacterium	33882	16.24	0.04%	0.16	0.16	207
unclassified Actinobacteria	1752188	16.2	0.04%	1.26	1.26	2
Methanosaeta sp. UBA533	1915562	16.19	0.04%	0.38	0.42	59
Demequinaceae bacterium UBA4004	1951643	15.59	0.04%	0.23	0.24	446
Hylemonella sp. UBA6679	1946611	15.01	0.04%	0.11	0.11	649
Microbacterium ginsengisoli	400772	14.59	0.03%	0.17	0.17	667
Patescibacteria group bacterium UBA5230	1948829	14.69	0.03%	0.73	2.31	7
Agrobacterium	357	14.48	0.03%	0.15	0.15	50
unclassified Actinomycetales (miscellaneous)	105426	14.31	0.03%	0.52	0.52	8
Comamonas terrigena	32013	13.73	0.03%	0.13	0.19	561
Microbacteriaceae bacterium	1873462	13.85	0.03%	0.12	0.12	868
Desulfobulbaceae bacterium UBA5750	1961557	13.39	0.03%	0.39	0.22	25
Thiomonas sp. UBA7699	1947694	13.56	0.03%	0.13	0.13	590
unclassified Deltaproteobacteria (miscellaneous)	122706	12.97	0.03%	0.19	0.17	80
Comamonas sp. UBA2122	1946390	11.99	0.03%	0.11	0.11	373
Gammaproteobacteria bacterium	1913989	12.01	0.03%	0.25	0.28	84
Comamonas kerstersii	225992	11.97	0.03%	0.10	0.10	516
Rhodocyclaceae bacterium UBA6160	1952847	11.84	0.03%	0.19	0.19	189
unclassified Anaerolineaceae	1324991	11.76	0.03%	0.11	0.11	15
Deltaproteobacteria bacterium	2026735	11.01	0.03%	0.20	0.17	153

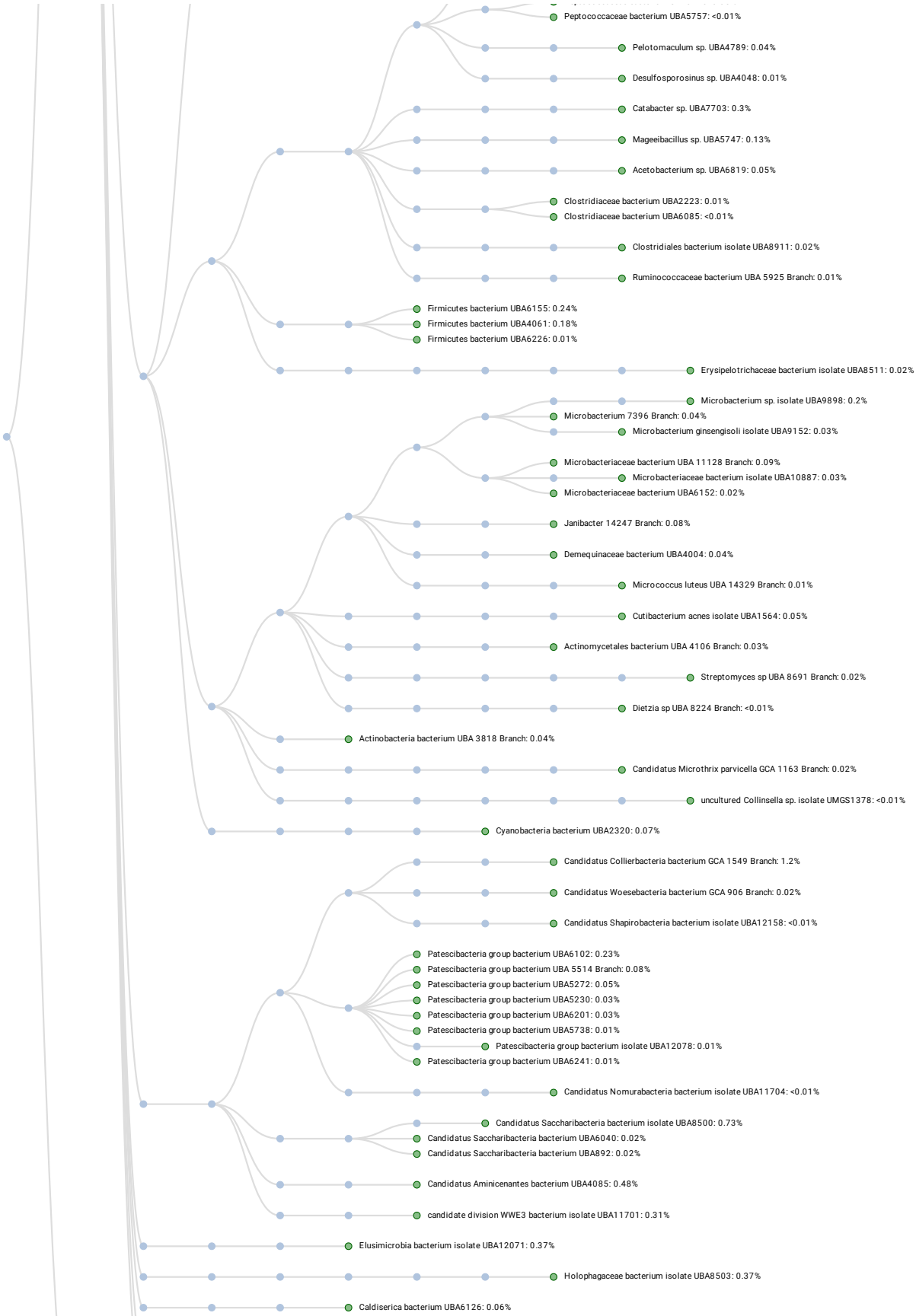
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Patescibacteria group bacterium UBA6201	1948846	10.63	0.03%	0.27	0.27	43
Synergistaceae bacterium UBA6101	1952925	10.41	0.03%	0.26	0.41	43
Sulfurospirillum sp. UBA1314	1947592	10.28	0.02%	0.20	0.23	128
Stenotrophomonas maltophilia	40324	9.92	0.02%	0.12	0.12	489
unclassified Pseudomonas	2583993	9.94	0.02%	0.24	0.24	5
Candidatus Saccharibacteria bacterium UBA6040	1953362	9.67	0.02%	0.12	0.12	166
Sulfurospirillum cavolei	366522	9.07	0.02%	0.18	0.18	129
Chryseobacterium sp.	1871047	9.12	0.02%	0.21	0.15	176
Streptomyces sp.	1931	9.34	0.02%	0.39	0.39	8
Candidatus Saccharibacteria bacterium UBA892	1953379	9.18	0.02%	0.19	0.19	72
Rhodocyclaceae bacterium UBA5533	1952844	9	0.02%	0.14	0.14	298
Betaproteobacteria bacterium UBA7395	1948463	8.64	0.02%	0.16	0.16	167
Deltaproteobacteria bacterium UBA4075	1948546	8.52	0.02%	0.23	0.16	56
Xanthomonadaceae bacterium	1926873	8.46	0.02%	0.15	0.15	199
Bacteroidales bacterium UBA6244	1950672	8.43	0.02%	0.15	0.16	151
Erysipelotrichaceae bacterium	2049044	8.38	0.02%	0.21	0.21	98
Microbacteriaceae bacterium UBA6152	1952248	8.52	0.02%	0.10	0.10	350
Sphaerochaeta sp. UBA6095	1947478	8.03	0.02%	0.21	0.20	39
Afipia sp.	1871052	7.91	0.02%	0.23	0.19	17
Clostridiales bacterium	1898207	7.93	0.02%	0.16	0.16	107
Candidatus Microthrix parvicella	41950	8.13	0.02%	0.23	0.15	27
Arenimonas sp.	1872635	7.59	0.02%	0.12	0.12	220
Leadbetterella sp. UBA7673	1946736	7.38	0.02%	0.14	0.14	152
Verrucomicrobiaceae bacterium UBA7681	1952943	7.23	0.02%	0.13	0.13	210
Desulfovibrionaceae bacterium UBA5821	1961565	6.46	0.02%	0.15	0.36	55
Caulobacteraceae bacterium UBA5005	1951539	6.12	0.02%	0.11	0.11	151

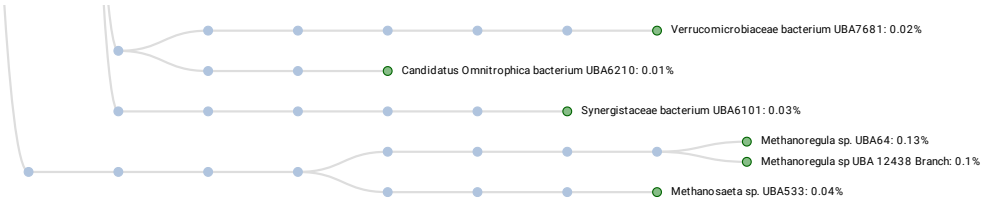
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Rhizobiales bacterium UBA697	1951228	6.34	0.02%	0.10	0.11	239
Candidatus Hydrogenedentes bacterium UBA2224	1953211	6.41	0.02%	0.12	0.12	613
Candidatus Woesebacteria bacterium	2026804	6.32	0.02%	0.20	0.20	20
Dehalococcoidia bacterium UBA5629	1948506	5.71	0.01%	0.14	0.14	45
Desulfosporosinus sp. UBA4048	1946408	5.92	0.01%	0.23	0.40	11
Clostridiaceae bacterium UBA2223	1951570	5.73	0.01%	0.25	0.19	8
unclassified Ruminococcaceae (miscellaneous)	2305133	5.98	0.01%	0.19	0.19	5
Bacteroidetes bacterium UBA7674	1953172	5.45	0.01%	0.12	0.12	84
Ignavibacteria bacterium UBA2268	1948663	5.5	0.01%	0.17	0.21	21
Firmicutes bacterium UBA6226	1948091	5.67	0.01%	0.13	0.13	81
Micrococcus luteus	1270	5.44	0.01%	0.10	0.10	40
Desulfatitalea sp. UBA4791	1961412	5.11	0.01%	0.10	0.10	318
Anaerolineaceae bacterium UBA1363	1951402	4.87	0.01%	0.12	0.12	51
Anaerolineales bacterium UBA4823	1950210	5.1	0.01%	0.13	0.13	50
Patescibacteria group bacterium UBA5738	1948834	4.84	0.01%	0.14	0.23	28
Pelobacter sp. UBA6812	1961381	4.44	0.01%	0.10	0.10	101
Desulfovibrionaceae bacterium UBA5842	1961566	4.46	0.01%	0.11	0.33	49
Anaerolineaceae bacterium UBA6133	1951441	4.8	0.01%	0.12	0.12	50
Patescibacteria group bacterium	2052139	4.54	0.01%	0.28	0.22	4
Patescibacteria group bacterium UBA6241	1948849	4.5	0.01%	0.12	0.12	30
Candidatus Omnitrophica bacterium UBA6210	1953267	4.74	0.01%	0.11	0.11	62
Stenotrophomonas acidaminiphila	128780	4.2	0.01%	0.11	0.13	40

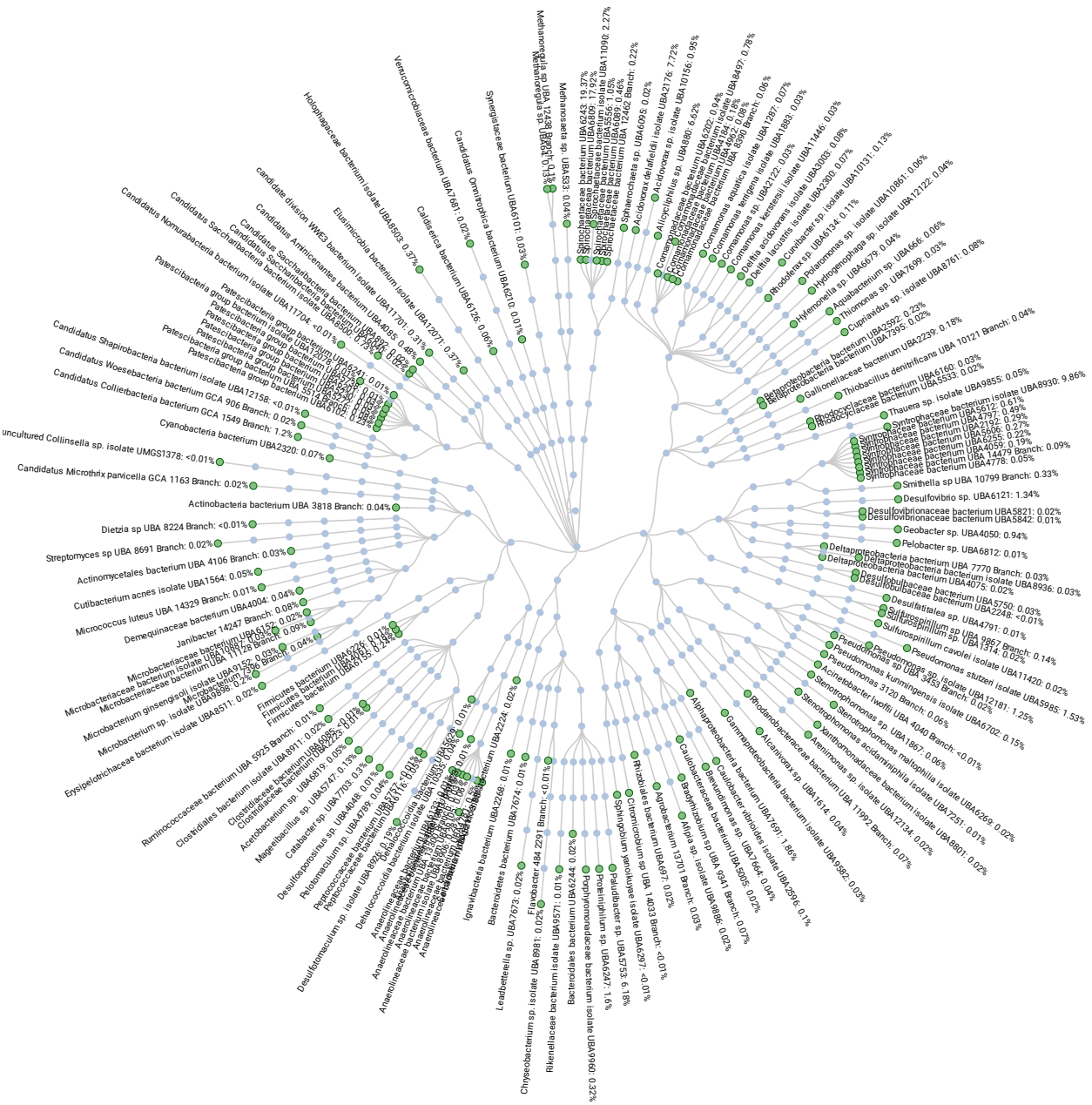
Name	Taxonomy Id	Abundance Score	Relative Abundance	% Unique Matches	% Total Matches	Unique Matches Frequency
Rikenellaceae bacterium	2049048	4.16	0.01%	0.12	0.12	28
unclassified Citromicrobium	2630544	3.95	<0.01%	0.32	0.32	2
Flavobacteriales	200644	3.84	<0.01%	0.10	0.10	5
Peptococcaceae bacterium UBA5757	1952716	3.91	<0.01%	0.10	0.10	46
Clostridiaceae bacterium UBA6085	1951587	3.44	<0.01%	0.12	0.17	13
Candidatus Shapirobacteria bacterium	2053613	3.34	<0.01%	0.12	0.12	12
Candidatus Nomurabacteria bacterium	2052152	3.47	<0.01%	0.12	0.12	13
Sphingobium yanoikuyae	13690	2.84	<0.01%	0.11	0.13	11
Desulfobulbaceae bacterium UBA2248	1961544	2.48	<0.01%	0.12	0.21	6
Acinetobacter lwoffii	28090	2.58	<0.01%	0.11	0.11	3
uncultured Collinsella sp.	165190	2.02	<0.01%	0.11	0.11	7
unclassified Dietzia	2617939	1.36	<0.01%	0.49	0.49	20

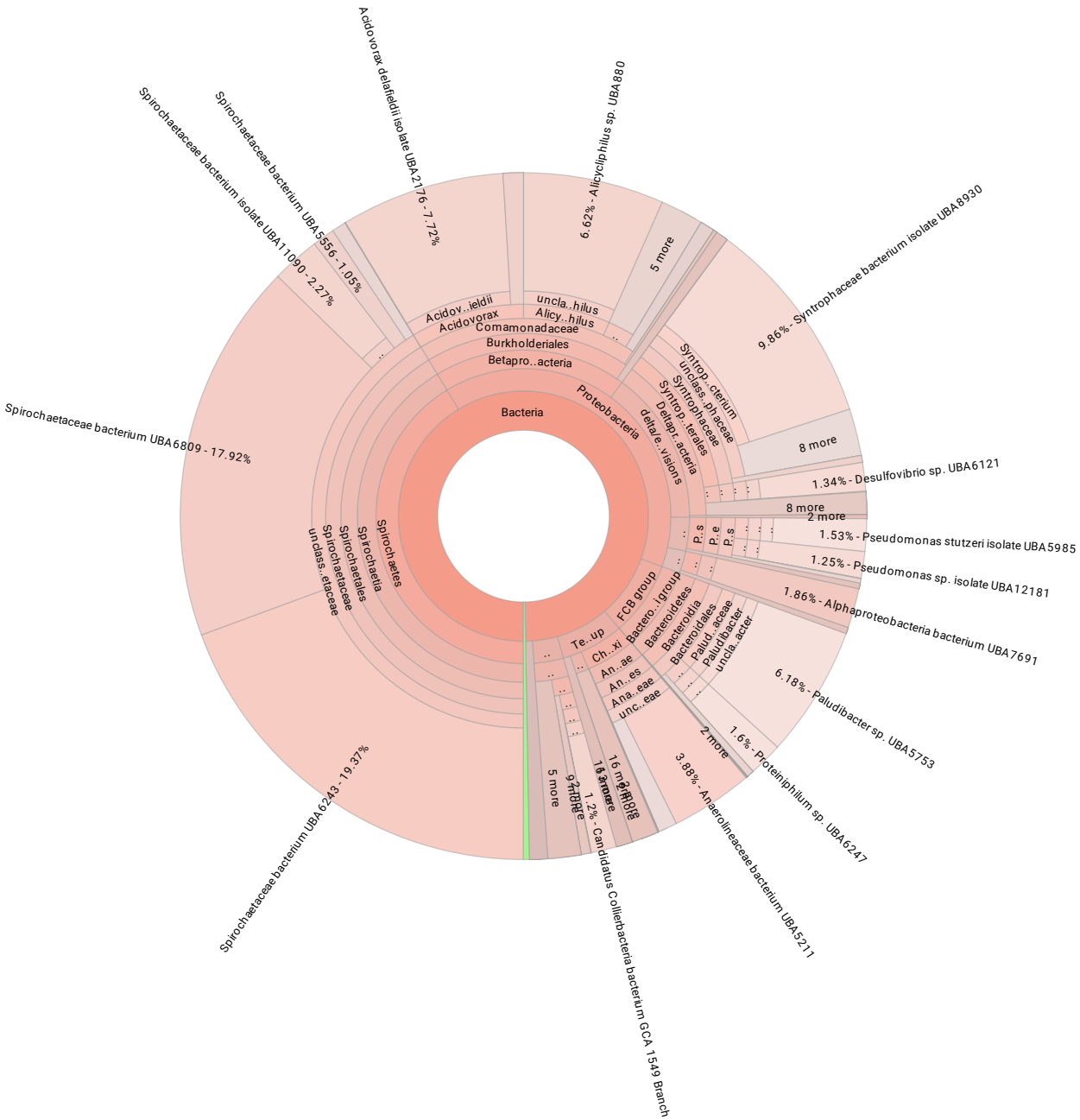

Spirochaetaceae bacterium UBA6243: 19.37%
Spirochaetaceae bacterium UBA6809: 17.92%
Spirochaetaceae bacterium isolate UBA11090: 2.27%
Spirochaetaceae bacterium UBA5556: 1.05%
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Acidovorax sp. isolate UBA10156: 0.95%
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Syntrophaceae bacterium isolate UBA8930: 9.86%
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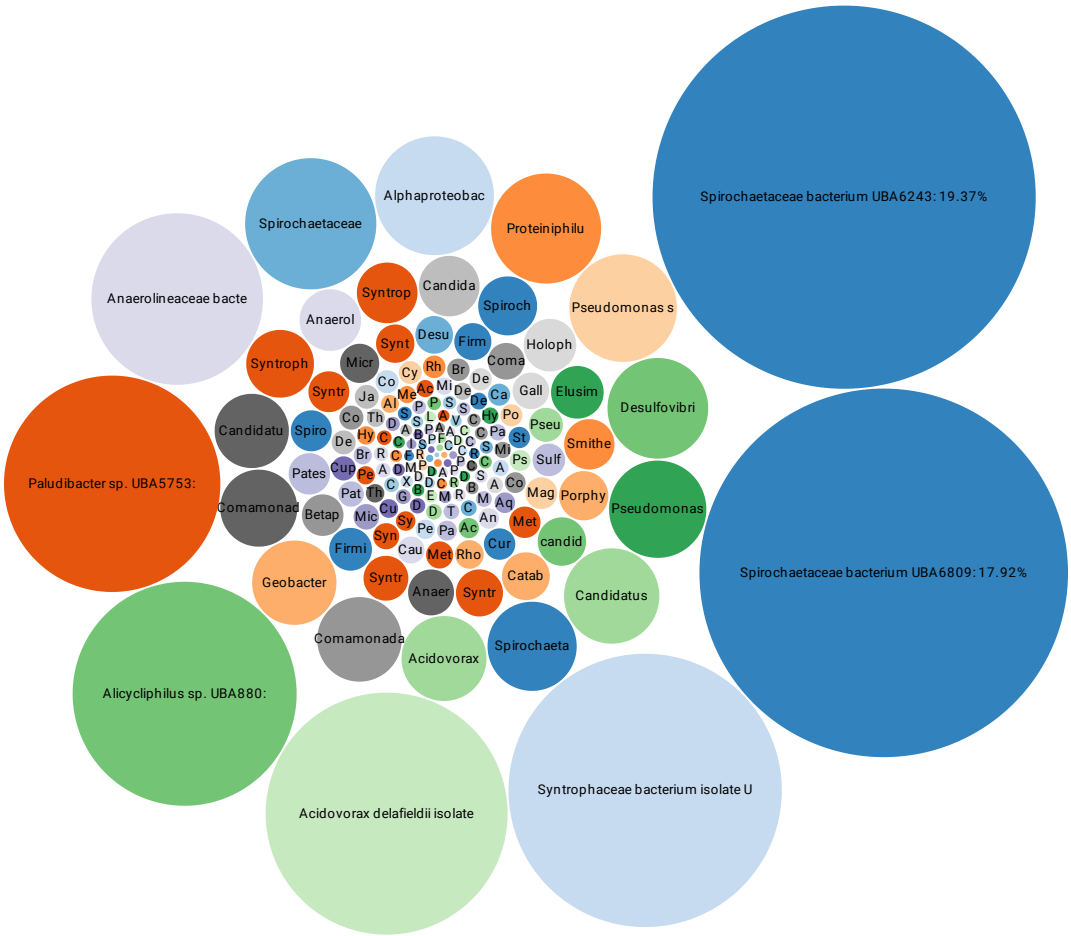

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Afipia sp. isolate UBA9886: 0.02%
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Leadbetterella sp. UBA7673: 0.02%
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Desulfotomaculum sp. isolate UBA8926: 0.19%
Peptococcaceae bacterium UBA6116: 0.05%


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Clostridiaceae bacterium UBA2223: 0.01%
Clostridiaceae bacterium UBA6085: <0.01%
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Ruminococcaceae bacterium UBA 5925 Branch: 0.01%
Firmicutes bacterium UBA6155: 0.24%
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Erysipelotrichaceae bacterium isolate UBA8511: 0.02%
Microbacterium sp. isolate UBA9898: 0.2%
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Dietzia sp UBA 8224 Branch: <0.01%
Actinobacteria bacterium UBA 3818 Branch: 0.04%
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Elusimicrobia bacterium isolate UBA12071: 0.37%
Holophagaceae bacterium isolate UBA8503: 0.37%
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Synergistaceae bacterium UBA6101: 0.03%
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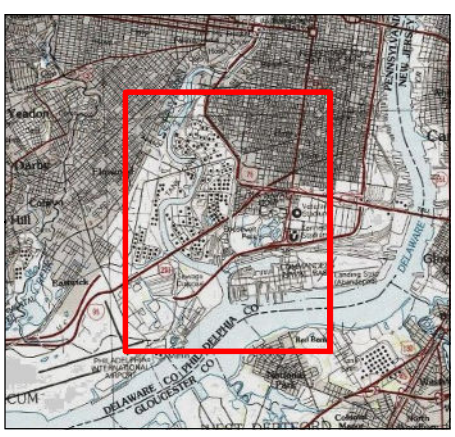

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Anaerolineaceae bacterium UBA6926: 0.12%
Anaerolineaceae


Bacteria
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Burkholderiales
Comamonadaceae
Acidov..ieldii
Acidovorax
uncla..hilus
Alicy..hilus
Deltapr..acteria
deltaPe..visions
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Ch..xi
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An..es
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unc..eae
P..s
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Acidovorax delafieldii isolate UBA2176 - 7.72%
Spirochaetaceae bacterium UBA5556 - 1.05%
Spirochaetaceae bacterium isolate UBA1090 - 2.27%
Spirochaetaceae bacterium UBA6809 - 17.92%
Spirochaetaceae bacterium UBA6243 - 19.37%
6.62% - Aliciclphilus sp. UBA880
9.86% - Syntrophaceae bacterium isolate UBA8930
1.34% - Desulfovibrio sp. UBA6121
1.53% - Pseudomonas stutzeri isolate UBA5985
1.25% - Pseudomonas sp. isolate UBA12181
1.86% - Alphaproteobacteria bacterium UBA7691
6.18% - Paludibacter sp. UBA5753
1.6% - Proteiniphilum sp. UBA6247
3.88% - Anaerolineaceae bacterium UBA5211
1.2% - Candidatus Collierbacteria bacterium GCA 1549 Branch
5 more
8 more
2 more
16 more
9 more


Spirochaetaceae bacterium UBA6243: 19.37%
Alphaproteobac
Spirochaetaceae
Proteiniphilu
Anaerolineaceae bacte
Syntrop
Candida
Spiroch
Pseudomonas s
Anaerol
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Firm
Holoph
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Syntroph
Micr
Coma
Rh
Br
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Co
Ac
Mi
De
Gall
Elusim
Syntr
Ja
Me
Ca
Desulfovibri
Candidatu
Spiro
Th
Hy
Po
Pseu
Smithe
Paludibacter sp. UBA5753:
Pates
Cup
Ps
Sulf
Comamonad
Betap
Porphy
Pseudomonas
Mag
Mic
Met
Firmi
candid
Cur
Geobacter
Rho
Catab
Syntr
Anaer
Candidatus
Comamonada
Acidovorax
Spirochaeta
Spirochaetaceae bacterium UBA6809: 17.92%
Alicycliphilus sp. UBA880:
Acidovorax delafieldii isolate
Syntrophaceae bacterium isolate U

Appendix T Former Philadelphia Refinery CSM Figures





LEGEND

- MARSH AREA
- STREAM LOCATION (1898)
- TOPOGRAPHIC CONTOUR
- FORMER PHILADELPHIA REFINERY
- AREA OF INTEREST (AOI)
- BELMONT TERMINAL

0.25 0 0.25 0.5 Miles

1:24,000 (At Original document size of 11x17)

N

Notes

1. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
2. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
3. Source: Stantec
4. Service Layer Credits: Imagery courtesy of USGS Earthstar Geographics SIO © 2015 Microsoft Corporation
   Copyright:© 2013 National Geographic Society, i-cubed

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Stantec

EVERGREEN

Project Location

City of Philadelphia,
Philadelphia County,
Pennsylvania

213403364

Prepared by ADK on 3/15/2024
Technical Review by JK on 3/18/2024
Independent Review by JLM on 3/18/2024

Client/Project

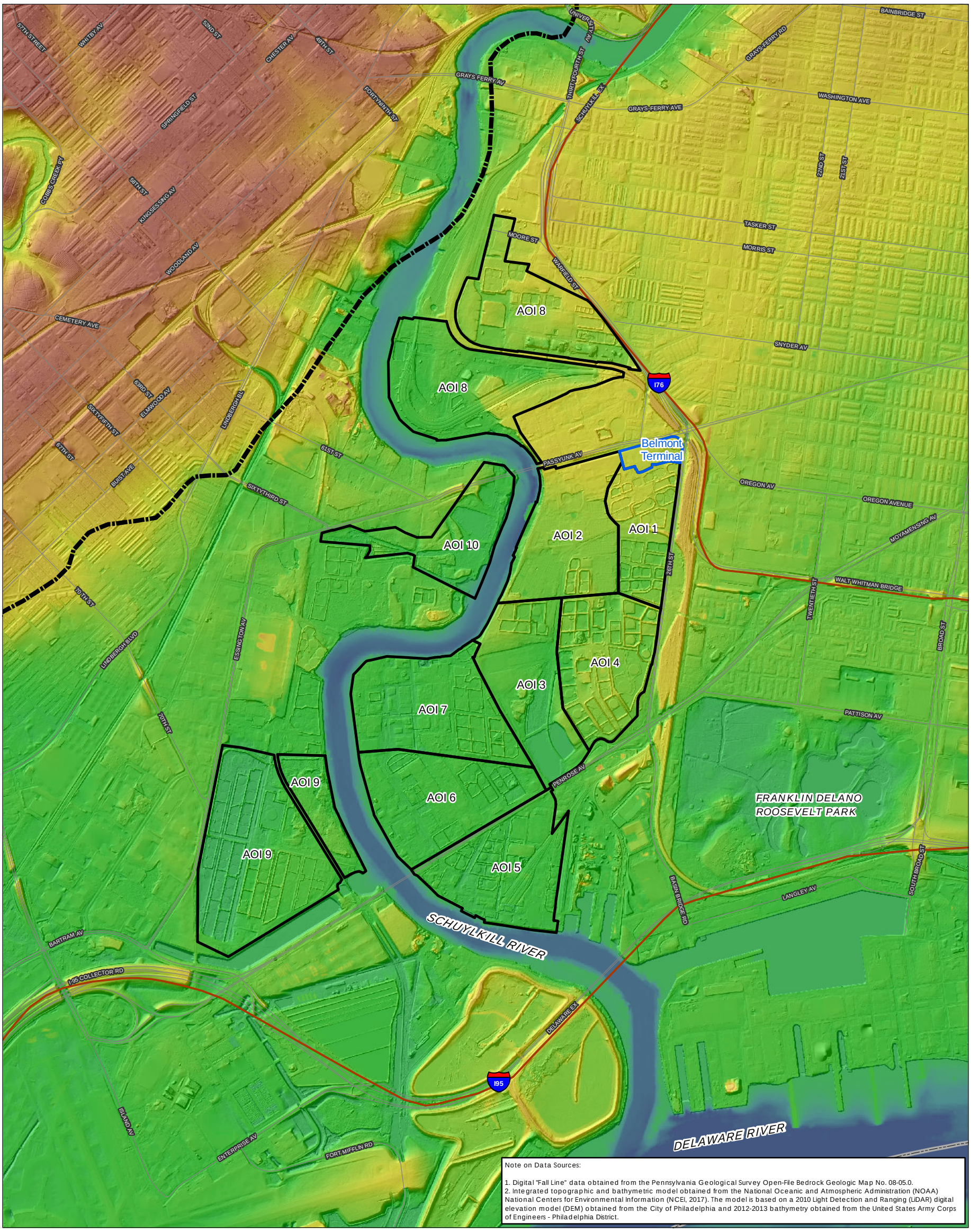
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FORMER PHILADELPHIA REFINERY
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Figure No.

2-3-1

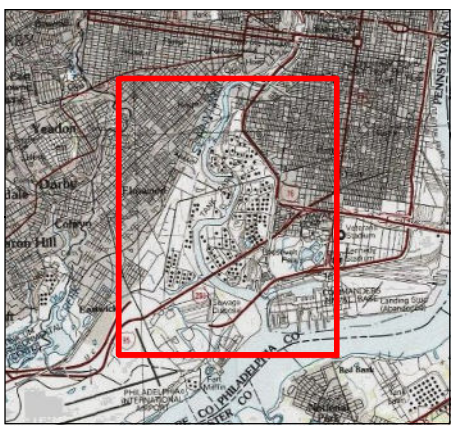
Title

HISTORIC STREAM AND MARSH LOCATIONS (CIRCA 1898)



Note on Data Sources:

1. Digital "Fall Line" data obtained from the Pennsylvania Geological Survey Open-File Bedrock Geologic Map No. 08-05.0.
2. Integrated topographic and bathymetric model obtained from the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI, 2017). The model is based on a 2010 Light Detection and Ranging (LiDAR) digital elevation model (DEM) obtained from the City of Philadelphia and 2012-2013 bathymetry obtained from the United States Army Corps of Engineers - Philadelphia District.



Notes

1. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
2. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
3. Source: Stantec
4. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed © Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2015 Microsoft Corporation

LEGEND

- "FALL LINE"
- STREAM
- WATERBODY
- FORMER PHILADELPHIA REFINERY AREA OF INTEREST (AOI)
- BELMONT TERMINAL
- STATE BOUNDARY

INTEGRATED TOPOGRAPHIC AND BATHYMETRIC MODEL (NCEI, 2017)

FEET NAVD88

High : 110

Low : -59

0.25 0 0.25 0.5 Miles

1:24,000 (At Original document size of 11x17)

N

Stantec

EVERGREEN

Project Location

City of Philadelphia,
Philadelphia County,
Pennsylvania

213403364
Prepared by ADK on 3/15/2024
Technical Review by JK on 3/18/2024
Independent Review by JLM on 3/18/2024

Client/Project

PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 WEST PASSYUNK AVENUE, PHILADELPHIA, PA 19145

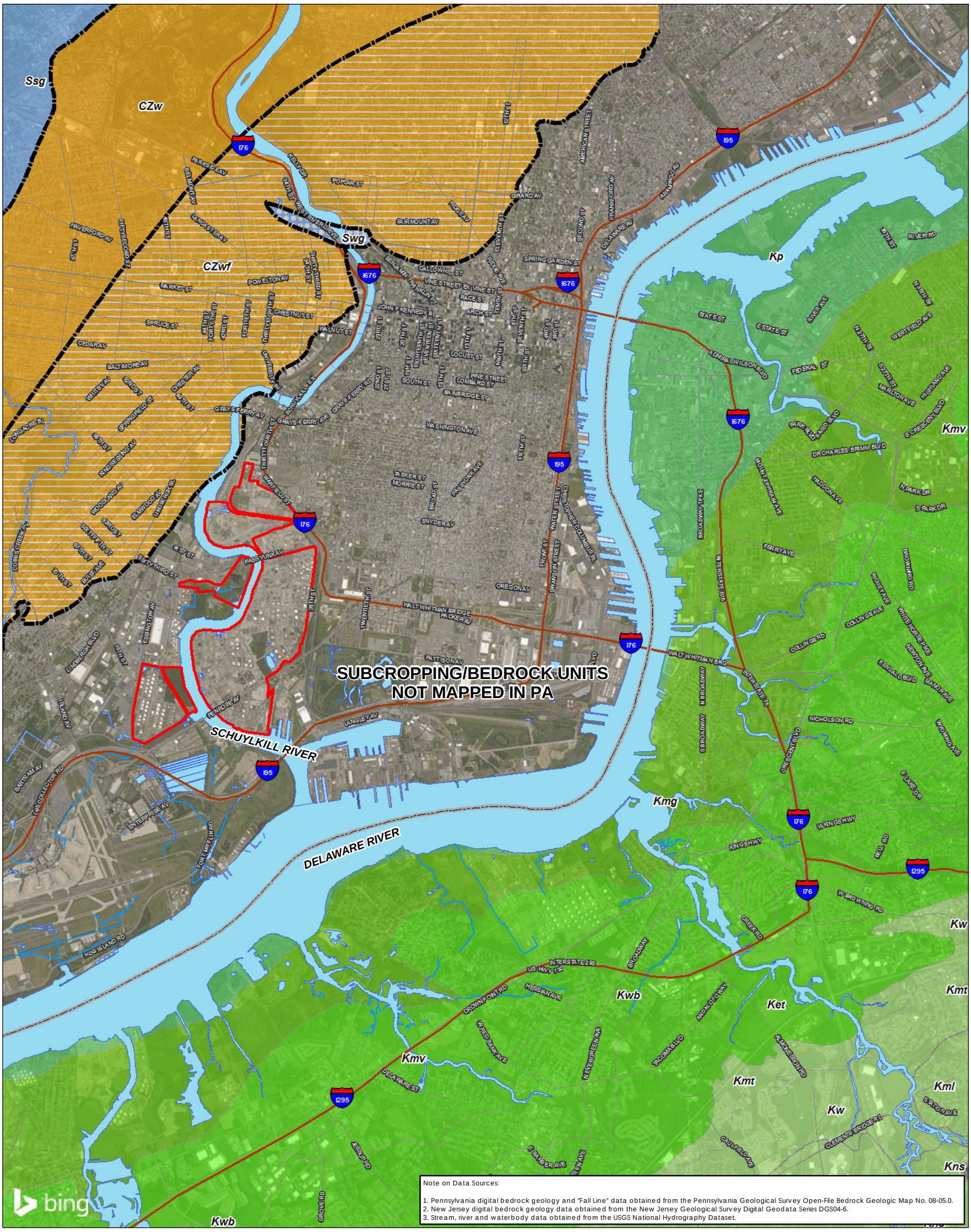
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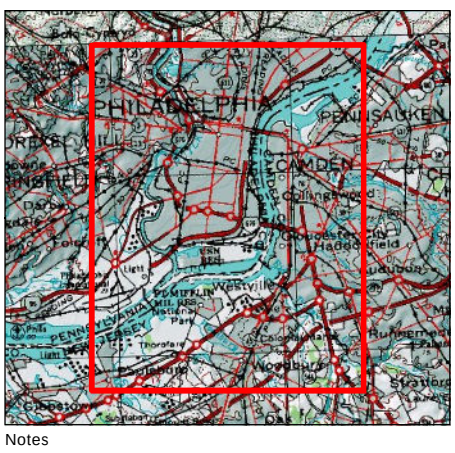
2-3-2

Title

GEOGRAPHIC SETTING

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LEGEND

- FALL LINE/INFERRED GEOLOGIC CONTACT
- STREAM
- WATERBODY
- FORMER PHILADELPHIA REFINERY
- STATE BOUNDARY
- *SPRINGFIELD GRANODIORITE FORMATION (Ssg)*
- *WATERWORKS GNEISS FORMATION (Swg)*
- *WISSAHICKON FORMATION (CZw)*
- *WISSAHICKON FORMATION - FAIRMOUNT MEMBER (CZwf)*
- *MT. LAUREL FORMATION (Kml)*
- *WENONAH FORMATION (Kw)*
- *MARSHALLTOWN FORMATION (Kmt)*
- *ENGLISHTOWN FORMATION (Ket)*
- *WOODBURY FORMATION (Kwb)*
- *MERCHANTVILLE FORMATION (Kmv)*
- *MAGOTHY FORMATION (Kmg)*
- *POTOMAC FORMATION (Kp)*

0.5 0 0.5 1 Miles

1:63,360 (At Original document size of 11x17)

N

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Notes

1. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
2. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
   Source: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
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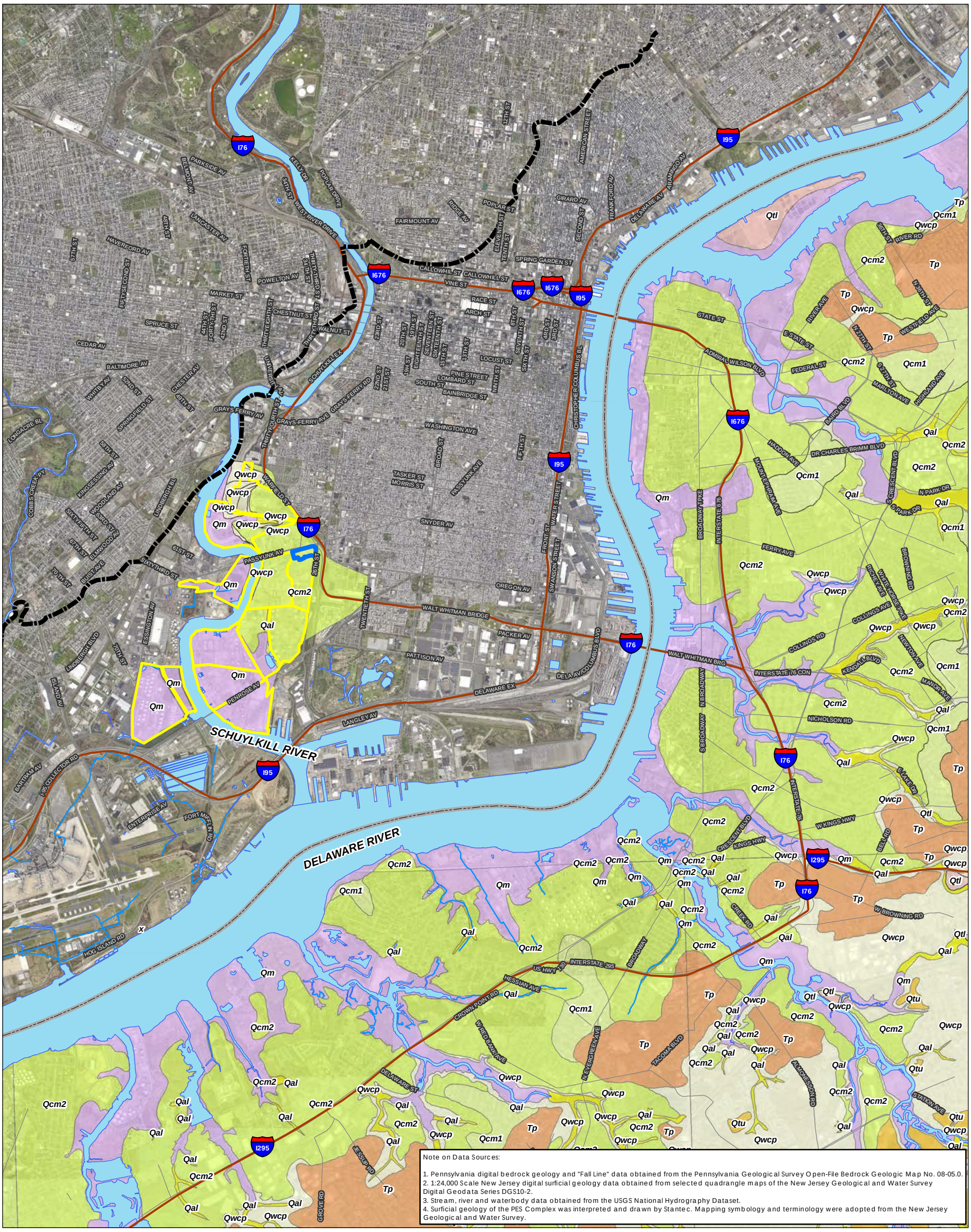
Project Location
City of Philadelphia,
Philadelphia County,
Pennsylvania

213402454
Prepared by ADK on 8/10/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/18/2018

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF
EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.
2-3-3

Title
GENERALIZED BEDROCK GEOLOGIC MAP





LEGEND

- FALL LINE/INFERRED GEOLOGIC CONTACT
- STREAM
- WATERBODY
- BELMONT TERMINAL
- FORMER PHILADELPHIA REFINERY AREA OF INTEREST (AOI)
- STATE BOUNDARY
- ALLUVIUM (Qal)
- CAPE MAY FORMATION UNIT 1 (Qcm1)
- CAPE MAY FORMATION UNIT 2 (Qcm2)
- SALT-MARSH AND ESTUARINE DEPOSITS (Qm)
- OUTCROP OF COASTAL PLAIN FORMATIONS (Qwcp)
- PENSAUKEN FORMATION (Tp)

0.5 0 0.5 1 Miles

1:63,360 (At Original document size of 11x17)

N

Notes

1. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
2. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet Source: Stantec
3. Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp.,
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Project Location
City of Philadelphia,
Philadelphia County,
Pennsylvania

213403364
Prepared by ADK on 3/18/2024
Technical Review by JK on 3/19/2024
Independent Review by JLM on 3/19/2024

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 WEST PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.
2-**3**-4

Title
GENERALIZED SURFICIAL GEOLOGIC MAP

Figure No.
2-3-5

Title
STRATIGRAPHIC PICK AND PROFILE LOCATION MAP

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF
EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 WEST PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location
City of Philadelphia,
Philadelphia County,
Pennsylvania

213403364
Prepared by ADK on 11/6/2024
Technical Review by JT on 11/6/2024
Independent Review by JK on 11/8/2024

0 1,000 2,000
Feet
1:29,936 (At original document size of 11x17)

N

LEGEND

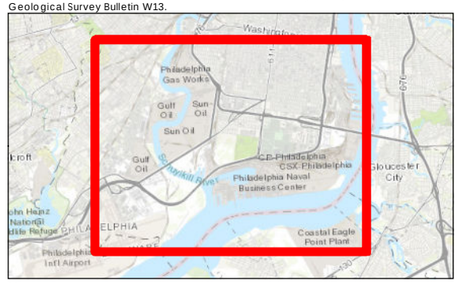
STRATIGRAPHIC 'PICK' LOCATION

- Soil/Test Boring Record
- Well Record
- Greenman et al. (1961) Historic Record
- FORMER PHILADELPHIA REFINERY
- BELMONT TERMINAL

STRATIGRAPHIC PROFILE

- A - A'
- B - B'
- C - C'
- D - D'
- E - E'
- F - F'
- G - G'
- H- H'
- I - I'
- J - J'
- K - K'
- L - L'
- M - M'
- N - N'

Reference:
Greenman, D.W., Rima, D.R., Lockwood, W.N., and Meisler, H. (1961). Groundwater Resources of the Coastal Plain Area of Southeastern Pennsylvania, Pennsylvania Geological Survey Bulletin W13.



Notes
1. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
2. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
3. Source: Stantec
4. Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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E
NORTHEAST

E'
SOUTHWEST

GRAYS FERRY/ I-76 | AOI 8 | PHILADELPHIA GAS WORKS | AOI 2 | AOI 3 | AOI 7 | AOI 6 | SCHUYLKILL RIVER | PHILADELPHIA RENEWABLE BIO-FUELS FACILITY | PHILADELPHIA WATER DEPARTMENT WATER POLLUTION CONTROL PLANT | PHILADELPHIA INTERNATIONAL AIRPORT

PH-55 N-27* N-46D* S-72D S-302D S-280D C-129D PH-41 C-134D B-134D B-132D B-7 B-4 B-1 PH-30 B-11

PLEISTOCENE ALLUVIUM AND/OR UPPER CLAY UNIT?
UPPER SAND UNIT
MIDDLE CLAY UNIT
MIDDLE SAND UNIT
BEDROCK
LOWER CLAY UNIT
LOWER SAND UNIT
FILL
PLEISTOCENE ALLUVIUM
UPPER SAND UNIT
MIDDLE SAND UNIT
HOLOCENE ALLUVIUM
PLEISTOCENE ALLUVIUM
LOWER SAND UNIT
BEDROCK
Schuylkill River
FILL
HOLOCENE ALLUVIUM
PLEISTOCENE ALLUVIUM
PLEISTOCENE ALLUVIUM
LOWER CLAY UNIT
UPPER SAND UNIT
MIDDLE CLAY UNIT
MIDDLE SAND UNIT
LOWER SAND UNIT
LOWER CLAY UNIT
UPPER CLAY UNIT

Elevation (ft NAVD88)

Distance Along Baseline (ft)

Legend:
- June 2018 Water-Level Elevation (Water-Table Aquifer)
- June 2018 Water-Level Elevation (Lower Aquifer)
- June 2018 Interpolated Water-Table Surface
- June 2018 Interpolated Lower Aquifer Surface
- Inferred Geologic Contact
- Inferred Lithologic Contact

Reference:
Greenman, D.W., Rima, D.R., Lockwood, W.N., and Meisler, H., 1961, Ground-Water Resources of the Coastal Plain Area of Southeastern Pennsylvania, Pennsylvania Topographic and Geologic Survey Bulletin W-13: 375 pgs.

Stantec

STRATIGRAPHIC PROFILE INTERPRETED BY ANDREW D. KLINGBEIL, PENNSYLVANIA PROFESSIONAL GEOLOGIST PG005029

GENERALIZED LITHOLOGY GRAPHICS

- Apparent Fill
- Sandy Gravel
- Gravelly Sand
- Sand (incl. trace to little silt/clay/gravel)
- "Muddy" Sand
- Organic-Rich "Mud" (silt/clay, incl. some organic material)
- "Mud" (silt/clay, incl. trace to little sand/gravel)
- Bedrock (incl. saprolite where indicated)
- Peat

Notes:
1. Land surface profile obtained from a 2010 light detection and ranging (LiDAR) elevation model available from the United States Geological Survey (USGS).
2. Lithologic logs for borings PH-30, PH-55, B-1, B-4, B-7, and B-11 were obtained from Tables 13 and 14 of Greenman et al., 1961. Geographic locations for those borings were digitized on-screen by Stantec using a georeferenced image of Greenman et al., 1961, Plate 1.
3. Water depths for the Schuylkill River are estimated from a March 2017 channel conditions survey obtained from the United States Army Corps of Engineers - Philadelphia District.
4. Water table and lower aquifer surfaces were interpolated from selected June 2018 gauging data using point kriging. *damaged/destroyed well with estimated screen length.
5. Stantec generalized lithologic data from available borehole logs into 9 categories as indicated for interpretive purposes."Mud" is utilized in these profiles to generally represent clay/silt mixtures, or clay and silt-rich sandy sediments. Holocene-age muds are colored a darker shade of green so they can be more easily distinguished from older units.
6. Correlation between lithologies and, where applicable, geologic units is based primarily on the straight-line method. Actual conditions between boreholes may vary from what is shown on this profile.
7. NAVD88 = North American Vertical Datum of 1988
8. Vertical Exaggeration ~ 45 X

Figure 2-3-10. Stratigraphic Profile E - E'

Philadelphia Refinery Operations
a series of Evergreen Resources Group, LLC
3144 Passyunk Avenue
Philadelphia, PA 19145

Project Number: 213403364

STRAT COLUMN SMALL AOI1 GENERALIZED SUBSURFACE PROFILES V4 PROFILEELIDAR.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/16/15

F
WEST

F'
EAST

AOI 7 | AOI 3 | AOI 4 | 26TH STREET | CSX PROPERTY | FORMER PASSYUNK HOMES PROPERTY | SOUTH PHILADELPHIA

C-144D PH-40 C-50D S-69D S-412 S-284D S-365 S-34 S-218D S-121 S-39D PH-DW-3 PH-85

FILL
HOLOCENE ALLUVIUM
PLEISTOCENE ALLUVIUM
UPPER SAND UNIT
UPPER CLAY UNIT
MIDDLE CLAY UNIT
MIDDLE SAND UNIT
LOWER SAND UNIT
LOWER CLAY UNIT
BEDROCK

APPROXIMATE LOCATION AND DIAMETER OF 26TH STREET INTERCEPTING SEWER

Elevation (ft NAVD88)

Distance Along Baseline (ft)

Legend:
- June 2018 Water-Level Elevation (Unconfined Aquifer)
- June 2018 Water-Level Elevation (Lower Aquifer)
- June 2018 Interpolated Water-Table Surface
- June 2018 Interpolated Lower Aquifer Surface
- Inferred Geologic Contact
- Inferred Lithologic Contact

References:

Greenman, D.W., Rima, D.R., Lockwood, W.N., and Meisler, H., 1961, Ground-Water Resources of the Coastal Plain Area of Southeastern Pennsylvania, Pennsylvania Topographic and Geologic Survey Bulletin W-13: 375 pgs.
Tetra Tech (2005). Intermediate and Deep Well Installation and Sampling Report for the Former Defense Supply Center Philadelphia Facility, Philadelphia, Pennsylvania.

Stantec

STRATIGRAPHIC PROFILE INTERPRETED BY ANDREW D. KLINGBEIL, PENNSYLVANIA PROFESSIONAL GEOLOGIST PG005029

GENERALIZED LITHOLOGY GRAPHICS

- Apparent Fill
- Sandy Gravel
- Gravelly Sand
- Sand (incl. trace to little silt/clay/gravel)
- "Muddy" Sand
- Organic-Rich "Mud" (silt/clay, incl. some organic material)
- "Mud" (silt/clay, incl. trace to little sand/gravel)
- Bedrock (incl. saprolite where indicated)
- Peat

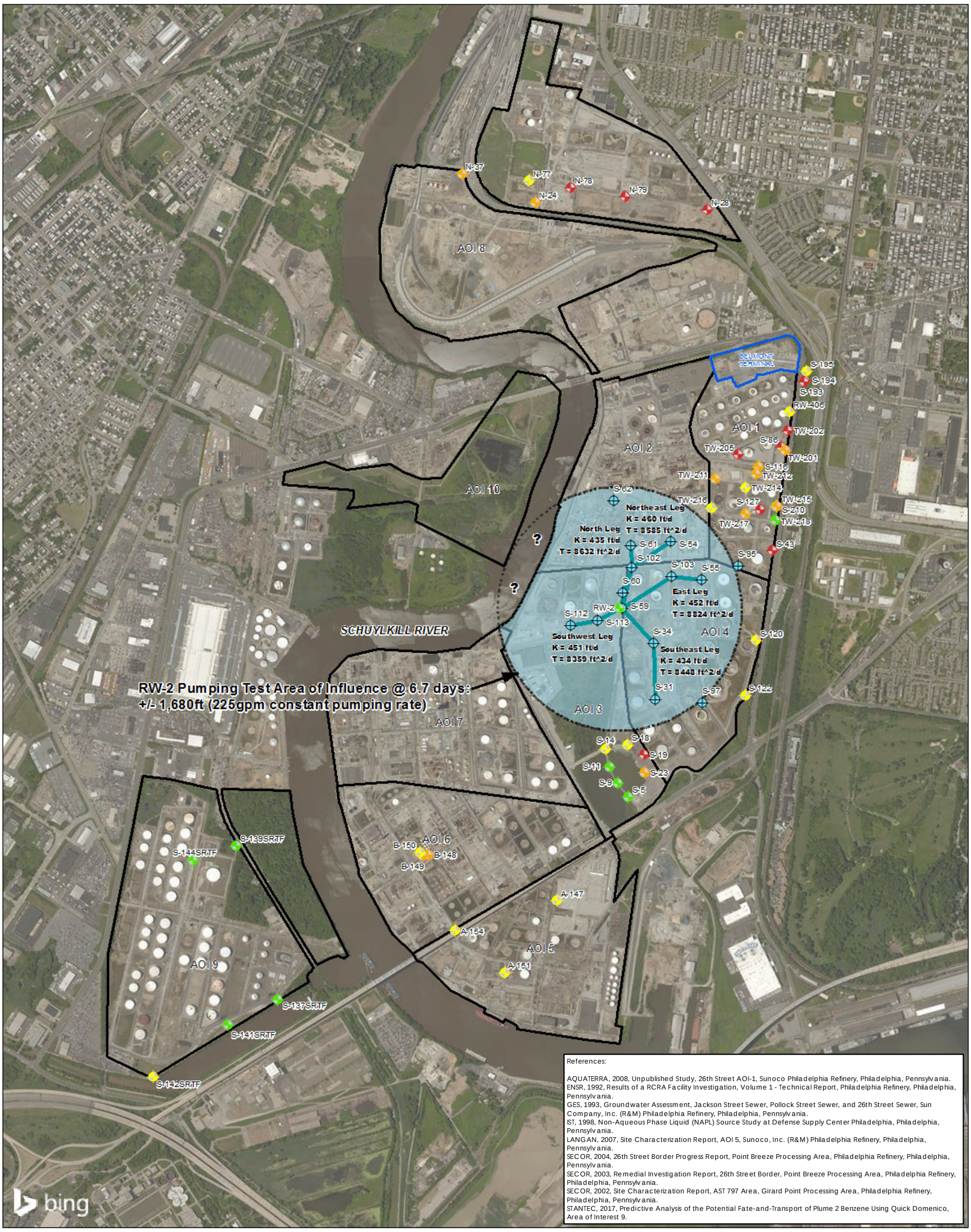
Notes:
1. Land surface profile obtained from a 2010 Light Detection and Ranging (LiDAR) elevation model available from the United States Geological Survey (USGS).
2. Lithologic logs for borings PH-40 and PH-85 were obtained from Tables 13 and 14 of Greenman et al., 1961. Geographic locations for those borings were digitized on-screen by Stantec. Lithologic logs, well construction, and survey data for well PH-DW-03 was obtained from Tetra Tech (2005).
3. Water-table and lower aquifer surfaces were interpolated from selected June 2018 gauging data using point kriging.
4. Stantec generalized lithologic data from available borehole logs into 9 categories as indicated for interpretive purposes. "Mud" is utilized in these profiles to generally represent clay/silt mixtures, or clay and silt-rich sandy sediments. Holocene-age muds are colored a darker shade of green so they can be more easily distinguished from older units.
5. Correlation between lithologies and, where applicable, geologic units is based primarily on the straight-line method. Actual conditions between boreholes may vary from what is shown on this profile.
6. North American Vertical Datum of 1988 = NAVD 88
7. Vertical Exaggeration ~ 36 X

Figure 2-3-11. Stratigraphic Profile F - F'

Philadelphia Refinery Operations
a series of Evergreen Resources Group, LLC
3144 Passyunk Avenue
Philadelphia, PA 19145

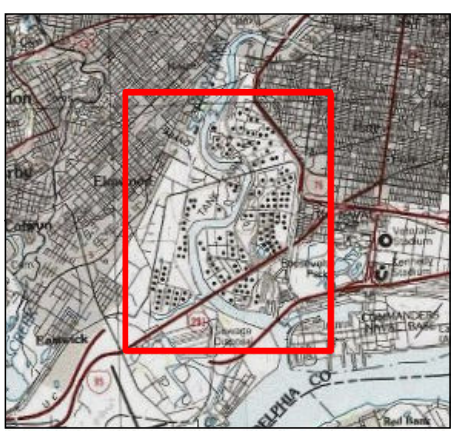
Project Number: 213403364

STRAT COLUMN WELL AND WAT LEVEL SM PRC_MASTER_GENERALIZEDLITHOLOGY_SUBSURFACE_PROFILES_V4_PROFILEELIDAR.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 2/9/17



References:

AQUATERRA, 2008, Unpublished Study, 26th Street AOI-1, Sunoco Philadelphia Refinery, Philadelphia, Pennsylvania.
ENSR, 1992, Results of a RCRA Facility Investigation, Volume 1 - Technical Report, Philadelphia Refinery, Philadelphia, Pennsylvania.
GES, 1993, Groundwater Assessment, Jackson Street Sewer, Pollock Street Sewer, and 26th Street Sewer, Sun Company, Inc. (R&M) Philadelphia Refinery, Philadelphia, Pennsylvania.
IST, 1998, Non-Aqueous Phase Liquid (NAPL) Source Study at Defense Supply Center Philadelphia, Philadelphia, Pennsylvania.
LANGAN, 2007, Site Characterization Report, AOI 5, Sunoco, Inc. (R&M) Philadelphia Refinery, Philadelphia, Pennsylvania.
SECOR, 2004, 26th Street Border Progress Report, Point Breeze Processing Area, Philadelphia Refinery, Philadelphia, Pennsylvania.
SECOR, 2003, Remedial Investigation Report, 26th Street Border, Point Breeze Processing Area, Philadelphia Refinery, Philadelphia, Pennsylvania.
SECOR, 2002, Site Characterization Report, AST 797 Area, Girard Point Processing Area, Philadelphia Refinery, Philadelphia, Pennsylvania.
STANTEC, 2017, Predictive Analysis of the Potential Fate-and-Transport of Plume 2 Benzene Using Quick Domenico, Area of Interest 9.



Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
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LEGEND

AVAILABLE ESTIMATES OF K (FT/D)

- 0 - 1
- 1 - 10
- 10 - 100
- 100+
- OBSERVATION WELL FOR RW-2 PUMPING TEST
- RW-2 PUMPING TEST LEG
- RW-2 TEST AREA OF INFLUENCE (APPROXIMATED)
- AREA OF INTEREST (AOI) BOUNDARY
- BELMONT TERMINAL

K	HYDRAULIC CONDUCTIVITY
T	TRANSMISSIVITY
ft/d	FEET PER DAY
gpm	GALLONS PER MINUTE
ft ^ 2/d	SQUARE FEET PER DAY

0 1,400 Feet

1:16,800 (At Original document size of 11x17)

N

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EVERGREEN

Project Location

City of Philadelphia, Philadelphia County, Pennsylvania

213402454

Prepared by ADK on 8/13/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/18/2018

Client/Project

PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.

2-3-20

Title

SUMMARY OF AVAILABLE AQUIFER TESTING DATA FOR THE UNCONFINED AQUIFER AT THE **FORMER PHILADELPHIA REFINERY**





LEGEND

- LOWER AQUIFER
- AREA OF INTEREST (AOI) BOUNDARY
- BELMONT TERMINAL
- K HYDRAULIC CONDUCTIVITY
- ft/d FEET PER DAY

0 1,300 Feet

1:15,600 (At Original document size of 11x17)

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Project Location
City of Philadelphia,
Philadelphia County,
Pennsylvania

213402454
Prepared by ADK on 8/13/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/18/2018

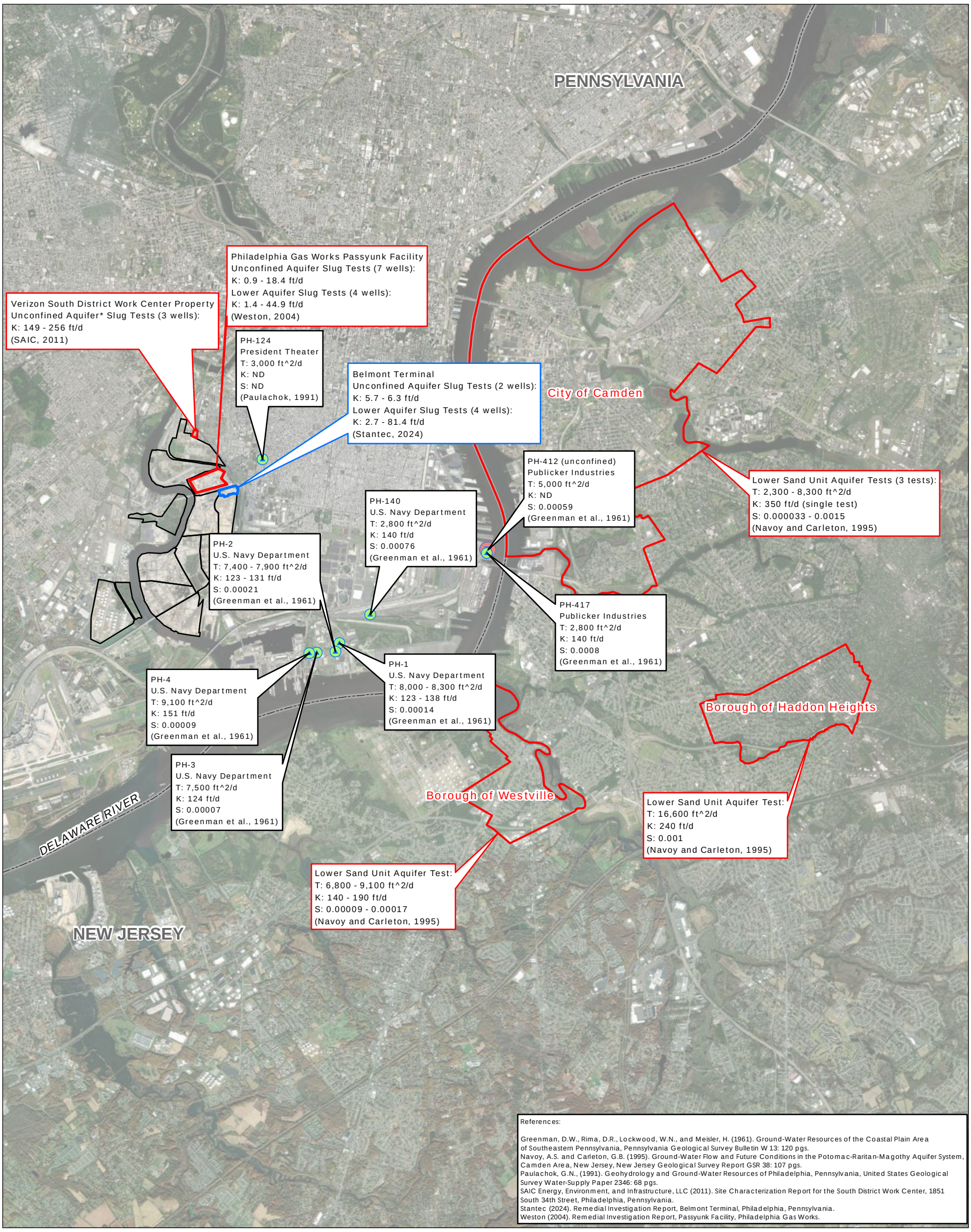
Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.
2-3-21

Title
SUMMARY OF AVAILABLE AQUIFER TESTING DATA FOR THE LOWER AQUIFER AT THE **FORMER PHILADELPHIA REFINERY**

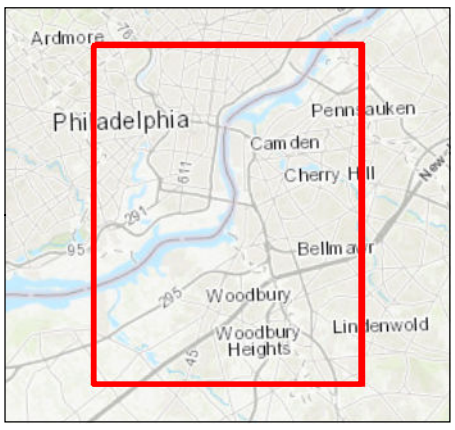
Notes
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. K values are rounded to the nearest ft/d for display purposes.
4. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
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References:

Greenman, D.W., Rima, D.R., Lockwood, W.N., and Meisler, H. (1961). Ground-Water Resources of the Coastal Plain Area of Southeastern Pennsylvania, Pennsylvania Geological Survey Bulletin W 13: 120 pgs.
Navoy, A.S. and Carleton, G.B. (1995). Ground-Water Flow and Future Conditions in the Potomac-Raritan-Magothy Aquifer System, Camden Area, New Jersey, New Jersey Geological Survey Report GSR 38: 107 pgs.
Paulachok, G.N., (1991). Geohydrology and Ground-Water Resources of Philadelphia, Pennsylvania, United States Geological Survey Water-Supply Paper 2346: 68 pgs.
SAIC Energy, Environment, and Infrastructure, LLC (2011). Site Characterization Report for the South District Work Center, 1851 South 34th Street, Philadelphia, Pennsylvania.
Stantec (2024). Remedial Investigation Report, Belmont Terminal, Philadelphia, Pennsylvania.
Weston (2004). Remedial Investigation Report, Passyunk Facility, Philadelphia Gas Works.



LEGEND

- LOWER SAND UNIT AQUIFER TEST LOCATION
- UNCONFINED AQUIFER TEST LOCATION
- FORMER PHILADELPHIA REFINERY AREA OF INTEREST (AOI) BOUNDARY
- BELMONT TERMINAL
- GENERAL LOCATION OF AQUIFER TESTING
- STATE BOUNDARY
- K — HYDRAULIC CONDUCTIVITY
- T — TRANSMISSIVITY
- S — STORATIVITY
- ft/d — FEET PER DAY
- ft ^ 2/d — SQUARE FEET PER DAY
- ND — NOT DETERMINED

Notes
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Source: Stantec
3. *Verizon SDWC slug test results may be influenced by the lower aquifer which subcrops locally
4. Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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0 1.25 2.5 Miles

1:79,200 (At Original document size of 11x17)

N

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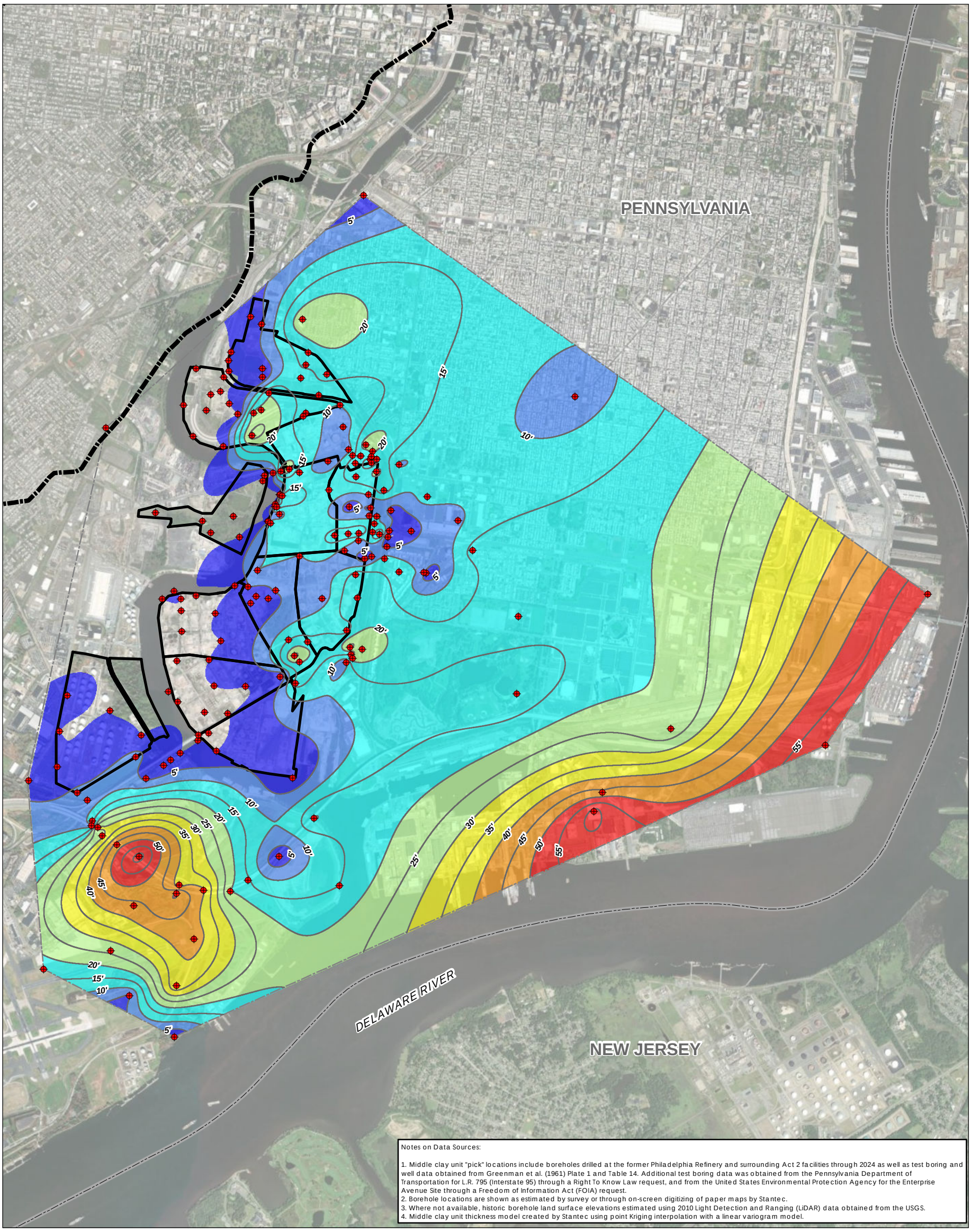
Project Location
City of Philadelphia,
Philadelphia County,
Pennsylvania

213402454
Prepared by ADK on 12/15/2024
Technical Review by JT on 12/15/2024
Independent Review by JK on 12/16/2024

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.
2-3-22

Title
SUMMARY OF PUBLISHED AQUIFER TESTING DATA FOR THE UNCONFINED AND LOWER AQUIFERS NEAR THE FORMER PHILADELPHIA REFINERY





Notes

1. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
2. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
3. Source: Stantec
4. Service Layer Credits: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
5. USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database,

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LEGEND

- MIDDLE CLAY UNIT "PICK" LOCATION
- MIDDLE CLAY THICKNESS CONTOUR (FEET)
- "FALL LINE"
- FORMER PHILADELPHIA REFINERY AREA OF INTEREST (AOI) BOUNDARY
- DATA LIMITS FOR MIDDLE CLAY UNIT INTERPOLATION
- STATE BOUNDARY

THICKNESS OF MIDDLE CLAY UNIT AQUITARD

FEET

- 0.2 - 5
- 5.1 - 10
- 10.1 - 20
- 20.1 - 30
- 30.1 - 40
- 40.1 - 50
- 50.1 - 60+

0 3,000 Feet

1:36,000 (At Original document size of 11x17)

N

Stantec

EVERGREEN

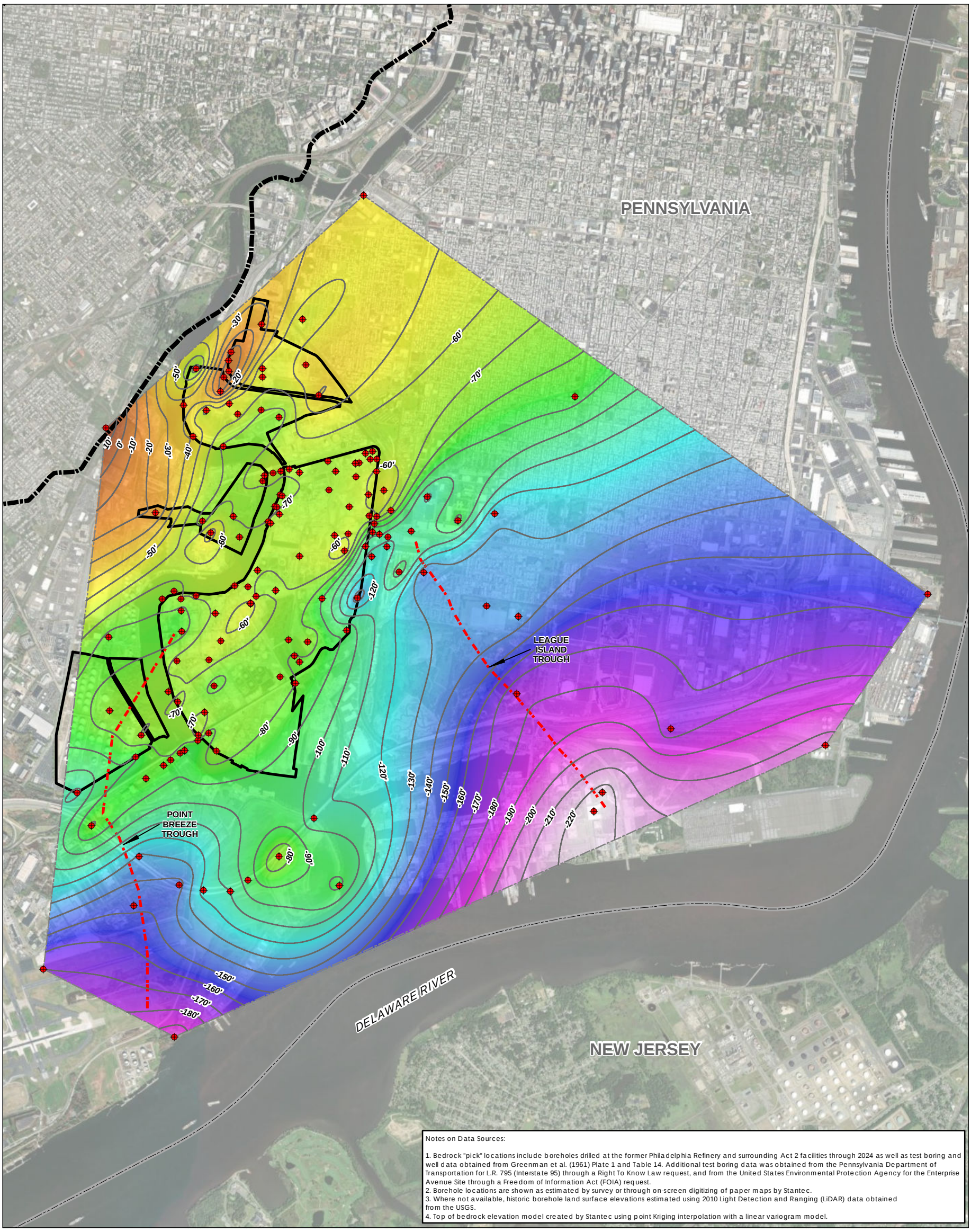
Project Location
City of Philadelphia,
Philadelphia County,
Pennsylvania

213403364
Prepared by ADK on 8/14/2018
Technical Review by JT on 12/16/2024
Independent Review by JK on 12/17/2024

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.
2-3-23

Title
ISOPACH MAP OF THE MIDDLE CLAY UNIT AQUITARD



Notes on Data Sources:

1. Bedrock "pick" locations include boreholes drilled at the former Philadelphia Refinery and surrounding Act 2 facilities through 2024 as well as test boring and well data obtained from Greenman et al. (1961) Plate 1 and Table 14. Additional test boring data was obtained from the Pennsylvania Department of Transportation for L.R. 795 (Interstate 95) through a Right To Know Law request, and from the United States Environmental Protection Agency for the Enterprise Avenue Site through a Freedom of Information Act (FOIA) request.
2. Borehole locations are shown as estimated by survey or through on-screen digitizing of paper maps by Stantec.
3. Where not available, historic borehole land surface elevations estimated using 2010 Light Detection and Ranging (LiDAR) data obtained from the USGS.
4. Top of bedrock elevation model created by Stantec using point Kriging interpolation with a linear variogram model.



Notes

1. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
2. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
3. Source: Stantec
4. Service Layer Credits: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
5. USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database,

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LEGEND

- TOP OF BEDROCK "PICK" LOCATION
- ESTIMATED BEDROCK ELEVATION (ft NAVD 88)
- "FALL LINE"
- APPROXIMATE AXIS OF MAIN CHANNEL OF BEDROCK TROUGH
- FORMER PHILADELPHIA REFINERY AREA OF INTEREST (AOI) BOUNDARY
- EXTENT OF INTERPOLATED BEDROCK SURFACE
- STATE BOUNDARY

BEDROCK ELEVATION MODEL (ft NAVD 88)
High : 20
Low : -227

0 3,000 Feet
1:36,000 (At Original document size of 11x17)

N

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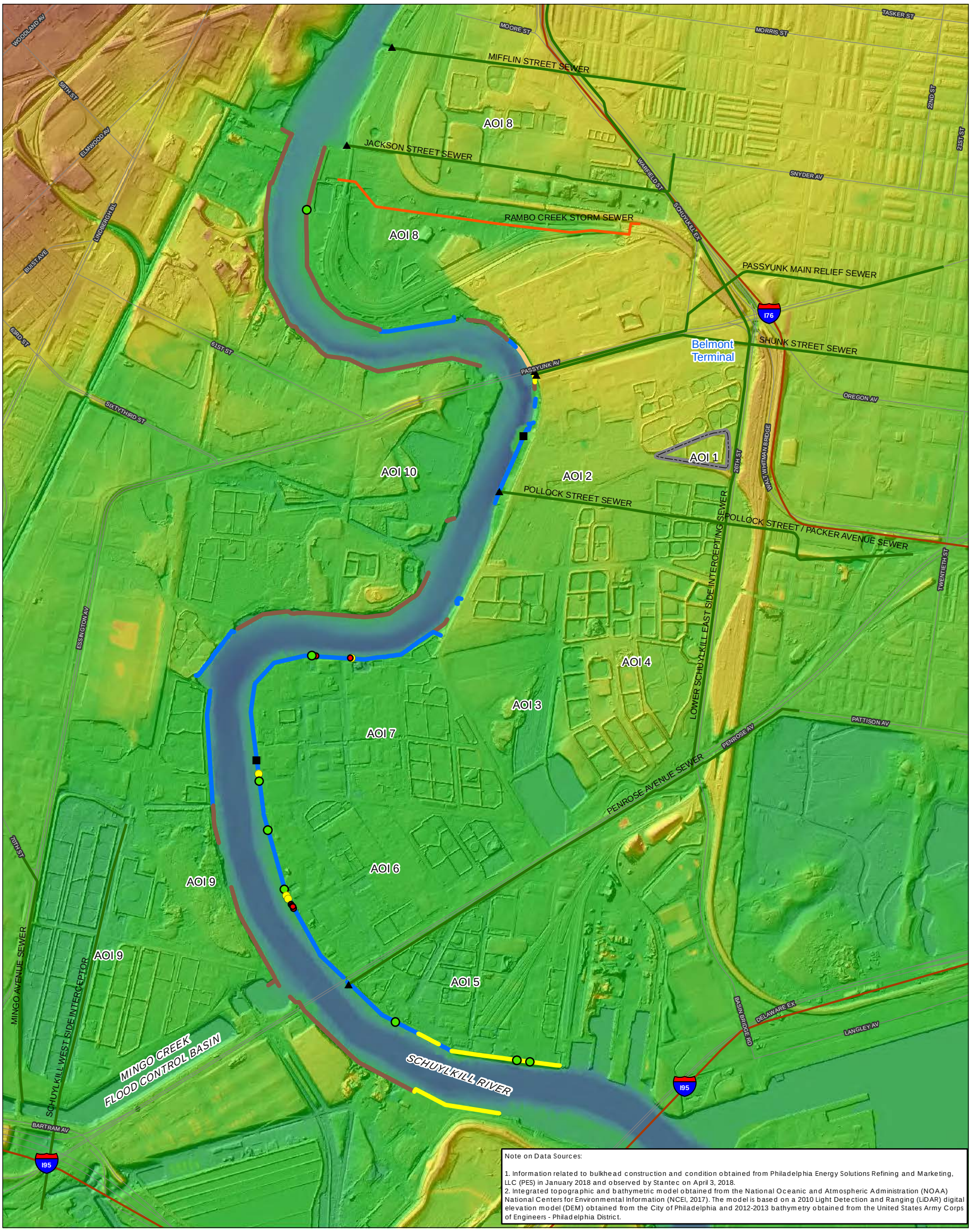
Project Location
City of Philadelphia,
Philadelphia County,
Pennsylvania

213403364
Prepared by ADK on 8/14/2018
Technical Review by JT on 12/16/2024
Independent Review by JK on 12/17/2024

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.
2-3-24

Title
BEDROCK STRUCTURE CONTOUR MAP - TOP OF BEDROCK



Note on Data Sources:

1. Information related to bulkhead construction and condition obtained from Philadelphia Energy Solutions Refining and Marketing, LLC (PES) in January 2018 and observed by Stantec on April 3, 2018.
2. Integrated topographic and bathymetric model obtained from the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI, 2017). The model is based on a 2010 Light Detection and Ranging (LiDAR) digital elevation model (DEM) obtained from the City of Philadelphia and 2012-2013 bathymetry obtained from the United States Army Corps of Engineers - Philadelphia District.



Notes

1. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
2. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
3. Source: Stantec and Philadelphia Energy Solutions Refining and Marketing, LLC (PES)
4. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed © Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2015 Microsoft Corporation

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LEGEND

Bulkhead Penetration Location

- Combined Sewer Outfall
- Open Pipe
- Capped/Sealed Pipe
- Pipe With Flap Gate
- Pipe End Submerged (Unknown)
- APPROXIMATE LOCATION OF PHILADELPHIA WATER DEPARTMENT SEWER
- APPROXIMATE LOCATION OF RAMBO CREEK STORM SEWER

Bulkhead Location

General Construction

- Concrete Cutoff Wall/Concrete Sheeting
- Steel Sheeting
- Masonry Wall
- Timber Sheeting

INTEGRATED TOPOGRAPHIC AND BATHYMETRIC MODEL (NCEI, 2017)

FEET NAVD88

- High : 110
- Low : -59

- Approximate Extent of Historic Borrow Pit

500 0 500 1,000 Feet

1:16,000 (At Original document size of 11x17)

N

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EVERGREEN

Project Location
City of Philadelphia,
Philadelphia County,
Pennsylvania

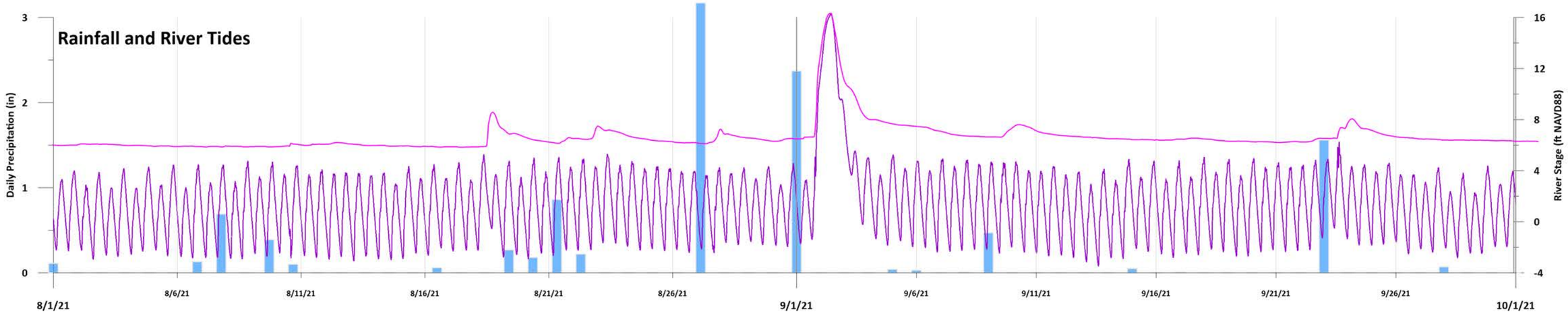
213402454
Prepared by ADK on 8/10/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/19/2018

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

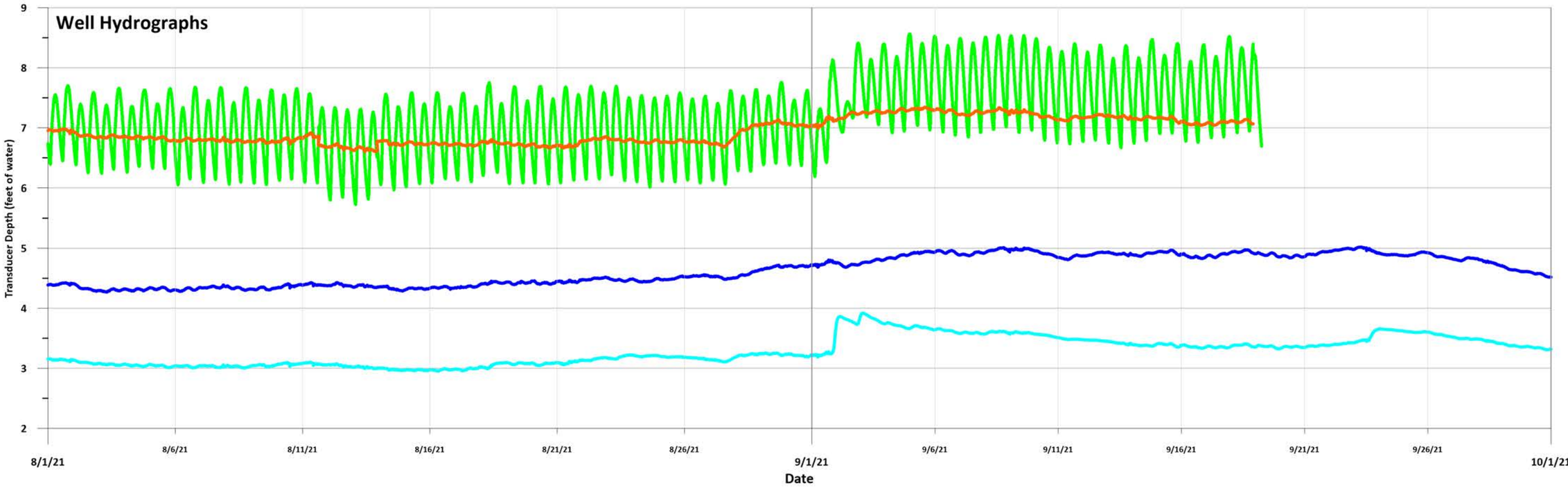
Figure No.
2-3-36

Title
FORMER PHILADELPHIA REFINERY - SCHUYLKILL RIVER SHORELINE AND BULKHEAD DATA

Rainfall and River Tides



Well Hydrographs





Notes

1. Monitoring well B-176, N-163, S-422, and S-423 water levels were continuously recorded using non-vented data loggers set to record water depth at 10 minute intervals. Transducer water depths were compensated for barometric pressure using linear correction to synoptic measurements collected with a barometric data logger placed at well S-422.
2. Precipitation data obtained from the NOAA National Center for Environmental Information (NCEI) for Philadelphia International Airport (PHL USW00013739); Schuylkill River stage data obtained from the USGS/PWD gages near 30th Street (USGS 01474501) and at Philadelphia (USGS 01474500).
3. 2022 aerial photograph obtained from the Pennsylvania Spatial Data Access (PASDA) internet mapping service.
4. FT NAVD 88 = feet referenced to the North American Vertical Datum of 1988
5. in = inches; gal = gallon; est = estimated

Rainfall and River Tides

- Daily Precipitation - PHL International Airport
- Stage - Schuylkill River Near 30th St.
- Stage - Schuylkill River at Philadelphia

Well Hydrographs

- S-422
- S-423
- N-163
- B-176

Stantec

Project Location
Former Philadelphia Refinery
Philadelphia, Pennsylvania

213403364
Prepared by ADK on 12/6/2024
Technical Review by JT on 12/10/2024
Independent Review by JK on 12/10/2024

Client/Project
PHILADELPHIA REFINERY OPERATIONS, a series of
EVERGREEN RESOURCES GROUP LLC
3144 W PASSYUNK AVENUE
PHILADELPHIA, PA 19145

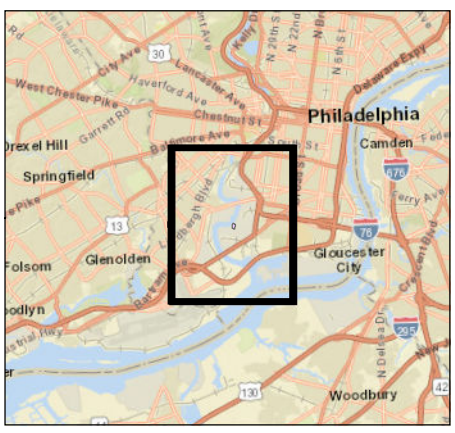
Figure No.
2-10-1

Title
GROUNDWATER RESPONSE TO SCHUYLKILL RIVER FLOODING EVENT SEPTEMBER 1, 2021

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Appendix U Well Search Documentation





LEGEND

- SEARCH AREA (1.25-MILE RADIUS FROM UDEX RELEASE)
- WELL LOCATION
- UDEX RELEASE AREA

0 0.25 0.5 Miles

1:24,000 (At Original document size of 11x17)

N

Stantec

Project Location
City of Philadelphia,
Philadelphia County,
Pennsylvania

195603450
Prepared by AW on 7/25/2025
Technical Review by AK on 7/25/2025
Independent Review by JK on 7/25/2025

Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PES REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.
Appendix U

Title
WELL SEARCH AREA

Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Summary of Well Search
Former Philadelphia Energy Solutions Refinery
Philadelphia, PA
June 2025

On June 6, 2025, Stantec conducted a 1.25-mile radius well for the UDEX underground line release area located in the former Philadelphia Energy Solutions (PES) Refinery using the Pennsylvania Groundwater Information System (PaGWIS) online database for the purpose of identifying potable water supply wells. This search incorporates results from previous well searches conducted for the former PES Refinery by Stantec on behalf of Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC (Evergreen) between 2017 and 2024. The most recent well search was submitted to the Pennsylvania Department of Environmental Protection (PADEP) as Appendix A-3 to *Volume 1 - Introduction of the Sitewide Fate and Transport Remedial Investigation Report, Human Health Risk Assessment, & Cleanup Plan* on January 2, 2025.

The PaGWIS database was accessed through the PaGEODE platform (https://www.gis.dcnr.state.pa.us/pageode/) which is maintained by the Pennsylvania Department of Conservation and Natural Resources (PADCNR) Bureau of Geological Survey. The well search included a buffer zone extending 1.25 miles from the approximate center point of the UDEX underground release area located in the former PES Refinery. A detailed review of the search results was conducted in order to determine if any wells in the search area might serve as a potential potable water source to human receptors. A table of search results is provided as **Table 1**. Wells identified in the PAGEODE search of the PaGWIS database evaluated for exclusion from potable water supply consideration based on the following criteria:

1. Well Use, Water Use, Well Activity Type, and Remarks
2. Well Ownership Information
3. Confirm well type and location from the individual well completion report (links provided in database search results)

The evaluation did not identify any potential potable water wells located within a 1.25-mile radius of the UDEX underground release area.

It is important to note that two pieces of City of Philadelphia code prohibit the use of water for potable supply from certain sources and/or without specific approval. Title 6 (Health Code), Chapter 6-400 (Miscellaneous Standards and Requirements) § 6.402(7) (Business, Professional, and Community Controls; Water and Ice) of The Philadelphia Code generally states that potable water (for human consumption) must come from a Pennsylvania Department of Health approved public water supply system or a system that must meet requirements prescribed by the City of Philadelphia Board of Health. Additionally, the 2004 Philadelphia Plumbing Code Chapter 8 (Water Supply and Distribution), Section P-802.1 (Quality of Water Supply for Potable Water) states that all water for human consumption (including food preparation and for washing purposes) must conform to the above Health Code and any

regulations promulgated thereafter. Based on the City of Philadelphia Health Code, Philadelphia Plumbing Code, detailed records review, and field reconnaissance, it is Stantec's opinion that the probability of any potable supply wells in use and/or existence within the search area is low.

Table 1
Well Search Results (2025) - Pennsylvania Groundwater Information System (PaGWIS)

PaGWIS Database Information								Data Analysis			
PA Well ID	Original Owner	Well Address	Date Drilled	Activity Type	Driller	Well Use	Remarks	Well excluded based of WellUSe, WaterUse, TypeOfActivity, or Remark	Well excluded based on review of Ownership Information	Well excluded based on review of Paper Log/ Duplicate record	Well excluded based upon location outside search radius
29763	PENN DOT		1/1/1984		UNKNOWN	OBSERVATION	OBSERVATION WELL FOR I-95 QW MONITORING	X			
29766	CONRAIL		1/1/1906		THOMAS B HARPER	DESTROYED		X			
29772	CONRAIL		12/26/1940		RIDPATH AND POTTER COMPANY	DESTROYED		X			
29773	GULF OIL CORP		9/1/1936		JOHN RULON	DESTROYED		X	X		
29775	GULF OIL CORP		8/1/1936		JOHN RULON	DESTROYED		X	X		
29777	GULF OIL CORP		9/1/1936		SPRAGUE & HENWOOD INC	DESTROYED		X	X		
29778	GULF OIL CORP		1/1/1936		SPRAGUE & HENWOOD INC	DESTROYED		X	X		
29779	GULF OIL CORP		1/1/1936		SPRAGUE & HENWOOD INC	DESTROYED		X	X		
29781	GULF OIL CORP		9/1/1936		SPRAGUE & HENWOOD INC	DESTROYED		X	X		
29788	ATLANTIC REFINING CO		1/1/1915		ARTESIAN WELL DRLG CO	DESTROYED		X	X		
29789	GULF OIL CORP		10/1/1936		JOHN RULON	DESTROYED		X	X		
29791	GULF OIL CORP		9/1/1936		SPRAGUE & HENWOOD INC	DESTROYED		X	X		
29801	ARCO PETROLEUM PROD CO		5/28/1987		AC SCHULTES INC	WITHDRAWAL	PETROLEUM PRODUCT RECOVERY WELL	X	X		
29802	ARCO PETROLEUM PROD CO		5/27/1987		AC SCHULTES INC	WITHDRAWAL			X		
29805	BROOKE H		1/1/1914		THOMAS B HARPER	DESTROYED		X			
29808	ARCO PETROLEUM PROD CO		6/24/1987		AC SCHULTES INC	WITHDRAWAL			X		
29812	ATLANTIC REFINING CO				UNKNOWN	DESTROYED		X	X		
29813	WFIL TRANSMISSION ST		1/5/1938		RIDPATH AND POTTER COMPANY	DESTROYED		X			
29815	ATLANTIC REFINING CO				UNKNOWN	DESTROYED		X	X		
29824	ATLANTIC REFINING CO		1/1/1937		UNKNOWN	DESTROYED		X	X		
29827	ATLANTIC REFINING CO				UNKNOWN	DESTROYED		X	X		
29831	ATLANTIC REFINING CO				UNKNOWN	DESTROYED		X	X		
29832	ATLANTIC REFINING CO		1/1/1925		Arthur Reinheimer Layne Christensen Compan	DESTROYED		X	X		
29840	ATLANTIC REFINING CO		1/1/1930		ARTESIAN WELL DRLG CO	DESTROYED		X	X		
29845	JARDIN BRICK CO		1/1/1923		QUINN & HERRON	DESTROYED		X			
29848	JARDIN BRICK CO		1/1/1908		QUINN & HERRON	DESTROYED		X			
29849	JARDIN BRICK CO		1/1/1906		QUINN & HERRON	DESTROYED		X			
29855	REGAL PETROLEUM PROD		10/24/1947		RIDPATH AND POTTER COMPANY	DESTROYED		X			
29857	ATLANTIC REFINING CO				UNKNOWN	DESTROYED		X	X		
29860	ATLANTIC REFINING CO		1/1/1933		UNKNOWN	DESTROYED		X	X		
29862	ATLANTIC REFINING CO				UNKNOWN	DESTROYED		X	X		
29863	ATLANTIC REFINING CO				UNKNOWN	DESTROYED		X	X		
29865	ATLANTIC REFINING CO		1/1/1921		UNKNOWN	DESTROYED		X	X		
29875	ATLANTIC RICHFIELD C		7/1/1979		UNKNOWN	OBSERVATION		X	X		
29876	ATLANTIC REFINING CO				UNKNOWN	DESTROYED		X	X		
29877	ATLANTIC RICHFIELD C		1/1/1977		UNKNOWN	OBSERVATION		X	X		
30398	GULF OIL CORP		1/1/1946		JOHN RULON	WITHDRAWAL		X			
30399	GULF OIL CORP		3/1/1946		JOHN RULON	WITHDRAWAL		X			
30414	PRINTZ DEGREASING CO		1/1/1903		THOMAS B HARPER	DESTROYED		X			

Table 1
Well Search Results (2025) - Pennsylvania Groundwater Information System (PaGWIS)

PaGWIS Database Information								Data Analysis			
PA Well ID	Original Owner	Well Address	Date Drilled	Activity Type	Driller	Well Use	Remarks	Well excluded based of WellUSe, WaterUse, TypeOfActivity, or Remark	Well excluded based on review of Ownership Information	Well excluded based on review of Paper Log/ Duplicate record	Well excluded based upon location outside search radius
30430	MIRTO CULLET SUPPLY		1/1/1933		ARTESIAN WELL DRLG CO	DESTROYED		X			
30431	PHILA GAS WORKS		1/1/1915		UNKNOWN	UNUSED		X	X		
30439	ATLANTIC REFINING CO		2/15/1946		RIDPATH AND POTTER COMPANY	UNUSED		X	X		
30443	ATLANTIC REFINING CO		1/1/1904		UNKNOWN	DESTROYED		X	X		
30444	ATLANTIC REFINING CO		7/30/1948		RIDPATH AND POTTER COMPANY	DESTROYED		X	X		
30446	ATLANTIC REFINING CO		1/1/1921		UNKNOWN	DESTROYED		X	X		
48199	SUN COMPANY		3/14/1994		EMPIRE SOILS INVESTIGATIONS INC	OBSERVATION		X	X		
48200	SUN COMPANY		3/2/1994		EMPIRE SOILS INVESTIGATIONS INC	OBSERVATION		X	X		
48201	SUN COMPANY		8/18/1995		UNKNOWN	WITHDRAWAL			X		
48202	SUN COMPANY		8/10/1995		UNKNOWN	WITHDRAWAL			X		
48203	SUN COMPANY		3/4/1994		EMPIRE SOILS INVESTIGATIONS INC	OBSERVATION		X	X		
48204	SUN COMPANY		2/25/1994		EMPIRE SOILS INVESTIGATIONS INC	OBSERVATION		X	X		
48360	SUN COMPANY		8/2/1995		UNKNOWN	WITHDRAWAL			X		
48362	SUN COMPANY		8/9/1995		UNKNOWN	WITHDRAWAL			X		
48363	SUN COMPANY		5/9/1994		UNKNOWN	WITHDRAWAL			X		
48364	SUN COMPANY		5/10/1994		UNKNOWN	WITHDRAWAL			X		
48365	SUN COMPANY		5/5/1994		UNKNOWN	WITHDRAWAL			X		
48366	SUN COMPANY		8/3/1995		UNKNOWN	WITHDRAWAL			X		
48367	SUN COMPANY		5/9/1994		UNKNOWN	WITHDRAWAL			X		
48368	SUN COMPANY		8/9/1995		UNKNOWN	WITHDRAWAL			X		
48369	SUN COMPANY		5/20/1994		UNKNOWN	WITHDRAWAL			X		
48370	SUN COMPANY		8/25/1994		UNKNOWN	WITHDRAWAL			X		
48371	SUN COMPANY		7/1/1994		UNKNOWN	WITHDRAWAL			X		
48372	SUN COMPANY		5/24/1994		UNKNOWN	WITHDRAWAL			X		
48373	SUN COMPANY		9/9/1993		UNKNOWN	WITHDRAWAL			X		
48374	SUN COMPANY		5/26/1994		UNKNOWN	WITHDRAWAL			X		
48376	SUN COMPANY		6/1/1995			WITHDRAWAL			X		
48378	SUN COMPANY		5/17/1994		UNKNOWN	WITHDRAWAL			X		
48379	SUN COMPANY		5/18/1994		UNKNOWN	WITHDRAWAL			X		
48380	SUN COMPANY		10/19/1994		UNKNOWN	WITHDRAWAL			X		
48381	SUN COMPANY		5/19/1994		UNKNOWN	WITHDRAWAL			X		
48382	SUN COMPANY		10/11/1994		UNKNOWN	WITHDRAWAL			X		
48383	SUN COMPANY					WITHDRAWAL			X		
48384	SUN COMPANY		6/1/1995			WITHDRAWAL			X		
48385	SUN COMPANY		5/11/1994		UNKNOWN	WITHDRAWAL			X		
48386	SUN COMPANY		6/5/1995		UNKNOWN	WITHDRAWAL			X		
48387	SUN COMPANY		5/13/1994		UNKNOWN	WITHDRAWAL			X		
48388	SUN COMPANY		6/5/1995		UNKNOWN	WITHDRAWAL			X		
48389	SUN COMPANY		6/2/1995		UNKNOWN	WITHDRAWAL			X		
48390	SUN COMPANY		5/10/1994		UNKNOWN	WITHDRAWAL			X		
48391	SUN COMPANY		5/12/1994		UNKNOWN	WITHDRAWAL			X		
48392	SUN COMPANY		5/11/1994		UNKNOWN	WITHDRAWAL			X		
48393	SUN COMPANY		5/12/1994		UNKNOWN	WITHDRAWAL			X		
48394	SUN COMPANY		11/5/1981		UNKNOWN	WITHDRAWAL			X		
48395	SUN COMPANY		5/31/1995		UNKNOWN	WITHDRAWAL			X		
424457	SUNOCO	REFINERY AREA	6/18/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424461	SUNOCO	REFINERY AREA	5/14/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424462	SUNOCO	REFINERY AREA	5/14/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424466	SUNOCO	REFINERY AREA	5/14/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424467	SUNOCO	REFINERY AREA	5/15/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424468	SUNOCO	REFINERY AREA	5/15/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		

Table 1
Well Search Results (2025) - Pennsylvania Groundwater Information System (PaGWIS)

PaGWIS Database Information								Data Analysis			
PA Well ID	Original Owner	Well Address	Date Drilled	Activity Type	Driller	Well Use	Remarks	Well excluded based of WellUSe, WaterUse, TypeOfActivity, or Remark	Well excluded based on review of Ownership Information	Well excluded based on review of Paper Log/ Duplicate record	Well excluded based upon location outside search radius
424469	SUNOCO	REFINERY AREA	5/15/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424470	SUNOCO	REFINERY AREA	5/15/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424471	SUNOCO	REFINERY AREA	5/16/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424472	SUNOCO	REFINERY AREA	5/20/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424473	SUNOCO	REFINERY AREA	5/20/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424474	SUNOCO	REFINERY AREA	5/21/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424475	SUNOCO	REFINERY AREA	5/21/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424476	SUNOCO	REFINERY AREA	5/21/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424477	SUNOCO	REFINERY AREA	5/22/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424478	SUNOCO	REFINERY AREA - ALONG RR W OF VARE AVE	6/6/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424479	SUNOCO	REFINERY AREA	6/9/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424490	SUNOCO	REFINERY AREA	7/9/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424503	SUNOCO	REFINERY AREA	5/13/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424504	SUNOCO	REFINERY AREA - OFF VARE AVE	5/22/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424505	SUNOCO	REFINERY AREA	5/29/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424506	SUNOCO	REFINERY AREA	5/29/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424507	SUNOCO	REFINERY AREA	5/29/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424508	SUNOCO	REFINERY AREA	5/28/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424509	SUNOCO	REFINERY AREA	5/23/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424511	SUNOCO	REFINERY AREA	6/4/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424512	SUNOCO	REFINERY AREA	6/5/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424513	SUNOCO	REFINERY AREA	6/5/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424565	SUNOCO	REFINERY AREA	7/1/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424570	SUNOCO	REFINERY AREA	6/18/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424571	SUNOCO	REFINERY AREA	6/18/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424572	SUNOCO	REFINERY AREA - W OF VARE AVE	6/20/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424576	SUNOCO	REFINERY AREA	6/17/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
424577	SUNOCO	REFINERY AREA	5/13/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
474515	SUNOCO	REFINERY AREA - OFF S 26TH ST	8/5/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
478648	SUNOCO	REFINERY AREA - OFF S 26TH ST	7/29/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
478667	SUNOCO	REFINERY AREA - OFF S 26TH ST	8/27/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
478852	SUNOCO	REFINERY AREA - OFF S 26TH ST	7/30/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
478853	SUNOCO	REFINERY AREA - OFF S 26TH ST	7/31/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
478886	SUNOCO	REFINERY AREA - OFF S 26TH ST	8/27/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
478889	SUNOCO	REFINERY AREA - OFF S 26TH ST	8/13/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
479415	SUNOCO	REFINERY AREA - OFF S 26TH ST	8/12/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
479770	SUNOCO	REFINERY AREA - OFF S 26TH ST	8/5/2008	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
480994	SUNOCO	REFINERY AREA-W OF LANIER AVE	6/10/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481002	SUNOCO	REFINERY AREA-W OF LANIER AVE	5/27/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481013	SUNOCO	REFINERY AREA-E OF LANIER AVE	5/14/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481016	SUNOCO	REFINERY AREA-E OF LANIER AVE	6/16/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481018	SUNOCO	REFINERY AREA- S OF W PASSYUNK	6/9/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481020	SUNOCO	REFINERY AREA- NR SCHUYLKILL AVE AND W PASSYUNK	5/5/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481021	SUNOCO	REFINERY AREA-N OF HARTRANFT	6/8/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481023	SUNOCO	REFINERY AREA - OFF SCHUYLKILL AVE	5/12/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481229	Essington Ave Partners II, L.P.	3062 South 61st.Street, Philadelphia, Pa	8/10/2009	New Well	B. L. MYERS BROS OF MD,LLC	MONITORING	The site location is at 3062 South 61st Street And is in between Passyunk Ave. & Eastwick Ave.	X			
481332	Terminal Oil	6850 Essington Ave	10/13/2011	New Well	ENVIRONMENTAL PROBING INVESTIGATIONS	MONITORING		X			
481761	SUNOCO	REFINERY AREA - OFF SCHUYLKILL AVE	6/2/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481762	SUNOCO	REFINERY AREA - W OF LANIER AVE	6/2/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481763	SUNOCO	REFINERY AREA - W OF LANIER AVE	6/3/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481764	SUNOCO	REFINERY AREA - W OF LANIER AVE	6/15/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481770	SUNOCO	REFINERY AREA - W OF LANIER AVE	5/27/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		

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PaGWIS Database Information								Data Analysis			
PA Well ID	Original Owner	Well Address	Date Drilled	Activity Type	Driller	Well Use	Remarks	Well excluded based of WellUSe, WaterUse, TypeOfActivity, or Remark	Well excluded based on review of Ownership Information	Well excluded based on review of Paper Log/ Duplicate record	Well excluded based upon location outside search radius
481776	SUNOCO	REFINERY AREA - W OF LANIER AVE NEAR RIVER	5/26/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481778	SUNOCO	REFINERY AREA - W OF LANIER AVE	6/3/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481781	SUNOCO	REFINERY AREA - S OF HARTRANFT	5/1/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481782	SUNOCO	REFINERY AREA - E OF LANIER	5/18/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481787	SUNOCO	REFINERY AREA - CNR SCHUYLKILL AVE AND W PASSYUNK	6/16/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481789	SUNOCO	REFINERY AREA - S OF W PASSYUNK	5/26/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481790	SUNOCO	REFINERY AREA - E OF SCHUYLKILL AVE	5/25/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481791	SUNOCO	REFINERY AREA - E OF SCHUYLKILL AVE	6/8/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481792	SUNOCO	REFINERY AREA - N OF HARTRANFT	5/20/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481793	SUNOCO	REFINERY AREA - N OF HARTRANFT	5/19/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481798	SUNOCO	REFINERY AREA - E OF SCHUYLKILL AVE	5/12/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481799	SUNOCO	REFINERY AREA - N OF HARTRANFT	6/11/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
481942	SUNOCO	REFINERY AREA - ALONG SCHUYLKILL AVE	5/21/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
482354	121 Point Breeze Terminal	6310 Passayunk Ave., Phila. Pa	8/13/2010	New Well	B. L. MYERS BROS OF MD,LLC	MONITORING	Site is Point Breeze Terminal locate at 6310 Passayunk Avenue in Philadelphia PA	X	X		
483483	SUNOCO REFINERY AREA	OFF S 26TH ST	1/27/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
483484	SUNOCO REFINERY AREA	OFF S 26TH ST	2/4/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
483486	SUNOCO REFINERY AREA	OFF S 26TH ST	2/6/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
483487	SUNOCO REFINERY AREA	OFF S 26TH ST	2/10/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
483488	SUNOCO REFINERY AREA	OFF S 26TH ST	2/18/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
483489	SUNOCO REFINERY AREA	OFF S 26TH ST	2/17/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
483490	SUNOCO REFINERY AREA	OFF 2 26TH ST	2/11/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
483491	SUNOCO REFINERY AREA	OFF S 26TH ST	2/10/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
483492	SUNOCO REFINERY AREA	OFF S 26TH ST	2/12/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
483493	SUNOCO REFINERY AREA	OFF S 26TH ST	2/13/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
483515	SUNOCO REFINERY AREA	OFF S 26TH ST	2/11/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
483882	Pacific Atlantic Terminal, LLC	6850 Essington Ave., Phila. Pa	4/5/2010	New Well	B. L. MYERS BROS OF MD,LLC	MONITORING	The Pacific Atlantic Terminal, LLC is located at 6850 Essington Ave., Phila. Pa	X			
483890	Pacific Atlantic Terminal, LLC	6850 Essington Ave., Phila. Pa	4/5/2010	Well Abandonment	B. L. MYERS BROS OF MD,LLC	MONITORING	The Pacific Atlantic Terminal, LLC is located at 6850 Essington Ave., Phila. Pa. Note: The numbers of bags used for the abandonment (1)	X			
484055	ESSINGTON AVENUE PARTNERS II, L.P.	3062 S. 61ST STREET	10/21/2011	Well Abandonment	C S GARBER & SONS INC	ABANDONED	MONITORING WELL #1	X			
484057	ESSINGTON AVENUE PARTNERS II, L.P.	3062 S. 61ST STREET	10/21/2011	Well Abandonment	C S GARBER & SONS INC	ABANDONED	MONITORING WELL #2	X			
484151	SUNOCO	REFINERY AREA - OFF S 26TH ST	1/28/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
484152	SUNOCO REFINERY AREA	OFF S 26TH ST	1/29/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
484153	SUNOCO REFINERY AREA	OFF S 26TH ST	2/3/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
484154	SUNOCO REFINERY AREA	OFF S 26TH ST	2/4/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
484155	SUNOCO REFINERY AREA	OFF S 26TH ST	2/12/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
484156	SUNOCO REFINERY AREA	OFF S 26TH ST	2/19/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
484158	SUNOCO REFINERY AREA	OFF S 26TH ST	2/18/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
484160	SUNOCO REFINERY AREA	OFF S 26TH ST	2/17/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
484161	SUNOCO REFINERY AREA	OFF S 26TH ST	2/16/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
484162	SUNOCO REFINERY AREA	OFF S 26TH ST	2/12/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
484163	SUNOCO REFINERY AREA	OFF S 26TH ST	2/12/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
484164	SUNOCO REFINERY AREA	OFF S 26TH ST	2/17/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
484263	Sunoco REFINERY AREA	S OF W PASSYUNK	4/19/2011	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
484264	Sunoco REFINERY AREA	S OF W PASSYUNK	4/18/2011	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
484265	Sunoco REFINERY AREA	S OF W PASSYUNK	4/20/2011	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
484266	Sunoco REFINERY RELATED	NR CNR ESSINGTON AND PASSYUNK	4/20/2011	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
484292	SUNOCO REFINERY AREA	OFF S 26TH ST	2/18/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
484293	SUNOCO REFINERY AREA	OFF S 26TH ST	2/19/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		

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484807	Sunoco REFINERY AREA	S OF W PASSYUNK	4/18/2011	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
484808	Sunoco REFINERY AREA	S OF W PASSYUNK	4/15/2011	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
484851	Sunoco REFINERY AREA	S OF W PASSYUNK	4/19/2011	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
484853	Sunoco REFINERY AREA	S OF W PASSYUNK	4/18/2011	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
484901	ESSINGTON AVENUE PARTNERS II, L.P.	3062 S. 61ST STREET	10/21/2011	Well Abandonment	C S GARBER & SONS INC	ABANDONED	MONITORING WELL #3	X			
484902	ESSINGTON AVENUE PARTNERS II, L.P.	3062 S. 61ST STREET	10/21/2011	Well Abandonment	C S GARBER & SONS INC	ABANDONED	MONITORING WELL #4R	X			
484903	ESSINGTON AVENUE PARTNERS II, L.P.	3062 S. 61ST STREET	10/21/2011	Well Abandonment	C S GARBER & SONS INC	ABANDONED	MONITORING WELL #5	X			
484904	ESSINGTON AVENUE PARTNERS II, L.P.	3062 S. 61ST STREET	10/21/2011	Well Abandonment	C S GARBER & SONS INC	ABANDONED	MONITORING WELL #6	X			
485077	Sunoco REFINERY AREA	S OF W PASSYUNK	4/6/2011	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
486018	Oil Terminal	6850 Essington Avenue	7/20/2009	New Well	ENVIRONMENTAL PROBING INVESTIGATIONS	MONITORING		X			
487860	ARCO		6/29/2011	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
487862	ARCO		7/7/2011	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
487864	ARCO		6/28/2011	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
488004	Sunoco REFINERY AREA	BETWEEN SCHUYLKILL AVE AND RIVER	8/22/2011	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
488005	Sunoco REFINERY AREA	BETWEEN SCHUYLKILL AVE AND RIVER	8/23/2011	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
488006	Sunoco REFINERY AREA	BETWEEN SCHUYLKILL AVE AND RIVER	8/25/2011	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
488007	Sunoco REFINERY AREA	BETWEEN SCHUYLKILL AVE AND RIVER	8/25/2011	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
488537	ARCO		6/29/2011	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
488645	Sunoco	REFINERY AREA - BETWEEN SCHUYLKILL AVE AND RIVER	8/22/2011	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
489934	Sunoco	REFINERY AREA - BETWEEN SCHUYLKILL AVE AND RIVER	8/26/2011	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
495283	SUNOCO REFINERY	OFF S 26TH ST	2/12/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
495284	SUNOCO REFINERY	OFF S 26TH ST	2/16/2009	New Well	PARRATT-WOLFF INC	INJECTION			X		
496787	SUNOCO REFINERY AREA	OFF LANIER NEAR RIVER	6/3/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
496788	SUNOCO REFINERY AREA	E OF SCHUYLKILL AVE	5/21/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
496789	SUNOCO REFINERY AREA	HARTRANFT ST	5/18/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
496790	SUNOCO REFINERY AREA	E OF SCHUYLKILL AVE	5/7/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
496791	SUNOCO REFINERY AREA	E OF SCHUYLKILL AVE	5/11/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
496795	SUNOCO REFINERY AREA	E OF SCHUYLKILL AVE	5/11/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
496796	SUNOCO REFINERY AREA	E OF SCHUYLKILL AVE	5/11/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
496797	SUNOCO REFINERY AREA	E OF SCHUYLKILL AVE	5/7/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
496800	SUNOCO REFINERY AREA	W OF LANIER AVE	6/15/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
497454	SUNOCO REFINERY AREA	BETWEEN LANIER AVE AND RIVER	6/2/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
497455	SUNOCO REFINERY AREA	N OF HARTRANFT ST	6/4/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
497456	SUNOCO REFINERY AREA	NR CNR HARTRANFT AND SCHUYLKILL AVE	6/10/2010	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
497975	ESSINGTON AVE USED AUTO PARTS	6770 Essington Avenue	7/7/2011	New Well	THOMAS KEYES, INC.	WITHDRAWAL	LAT-LONG BASED ON STREET ADDRESS.	X			
499506	Point Breeze Terminal	6310 Passyunk Ave., Phila. PA	5/18/2012	New Well	B. L. MYERS BROS OF MD,LLC	MONITORING	The site is at the Point Breeze Terminal: 6310 Passyunk Ave., Phila. PA	X	X		
499508	Point Breeze Terminal	6310 Passyunk Ave., Phila. PA	5/18/2012	Well Abandonment	B. L. MYERS BROS OF MD,LLC	MONITORING	The site is at the Point Breeze Terminal: 6310 Passyunk Ave., Phila. PA NOTE: The number of bags used for the abandonment (2)	X	X		
502519	Pacific Atlantic Terminals LLC	6850 Essington Ave	10/15/2012	New Well	ENVIRONMENTAL FIELD SERVICE INC	MONITORING		X			
502554	Pacific Atlantic Terminals LLC	6850 Essington Ave	10/15/2012	New Well	ENVIRONMENTAL FIELD SERVICE INC	MONITORING		X			
502555	Pacific Atlantic Terminals LLC	6850 Essington Ave	10/15/2012	New Well	ENVIRONMENTAL FIELD SERVICE INC	MONITORING		X			
504475	Defense Logistics Agency	S. 23rd Street, Philadelphia, PA 19145	1/14/2013	New Well	AMERIDRILL, INC.	MONITORING		X	X		
504918	Philadelphia Industrial Development Corp.	2751 S. 58th Street, Philadelphia, PA	2/13/2013	New Well	AMERIDRILL, INC.	MONITORING		X			
510374	Geosyntec Consultants		5/8/2013	New Well	Summit Drilling LLC	WITHDRAWAL	Installed two additional wells at this site with similar geologics (MW-2 to 20' and MW-3 to 20')	X			

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512462	Danbro, L.P.	26th Street	6/13/2013	Well Abandonment	ALLIED WELL DRILLING	MONITORING		X			
512463	Danbro, L.P.	26th Street	6/13/2013	Well Abandonment	ALLIED WELL DRILLING	MONITORING		X			
512464	Danbro, L.P.	26th Street	6/13/2013	Well Abandonment	ALLIED WELL DRILLING	MONITORING		X			
512465	Danbro, L.P.	26th Street	6/13/2013	Well Abandonment	ALLIED WELL DRILLING	MONITORING		X			
512466	Danbro, L.P.	26th Street	7/13/2013	Well Abandonment	ALLIED WELL DRILLING	MONITORING		X			
512467	Danbro, L.P.	26th Street	6/13/2013	Well Abandonment	ALLIED WELL DRILLING	MONITORING		X			
512482	Danbro, L.P.	26th Street	6/13/2013	Well Abandonment	ALLIED WELL DRILLING	MONITORING		X			
512483	Danbro, L.P.	26th Street	6/13/2013	Well Abandonment	ALLIED WELL DRILLING	MONITORING		X			
512484	Danbro, L.P.	26th Street	6/13/2013	Well Abandonment	ALLIED WELL DRILLING	MONITORING		X			
512485	Danbro, L.P.	26th Street	6/13/2013	Well Abandonment	ALLIED WELL DRILLING	MONITORING		X			
512486	Danbro, L.P.	26th Street	6/13/2013	Well Abandonment	ALLIED WELL DRILLING	MONITORING		X			
512487	Danbro, L.P.	26th Street	6/13/2013	Well Abandonment	ALLIED WELL DRILLING	MONITORING		X			
512488	Danbro, L.P.	26th Street	6/13/2013	Well Abandonment	ALLIED WELL DRILLING	MONITORING		X			
552338	Evergreen Resource Management		12/19/2013	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
552339	Evergreen Resource Management		2/20/2014	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
552340	Evergreen Resource Management		3/4/2014	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
552350	Evergreen Resource Management		3/5/2014	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
552351	Evergreen Resource Management		3/6/2014	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
552392	Evergreen Resource Management		3/12/2014	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
552406	Evergreen Resource Management		3/11/2014	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
552524	Evergreen Resource Management		12/18/2013	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
552525	Evergreen Resource Management		1/15/2014	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
552526	Evergreen Resource Management	2615 Hartranft St	1/9/2014	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
552527	Evergreen Resource Management		2/4/2014	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
552528	Evergreen Resource Management		2/25/2014	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
552529	Evergreen Resource Management		2/27/2014	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
552538	Evergreen Resource Management		12/3/2013	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
594159	Evergreen Resource Management		12/9/2014	Other	PARRATT-WOLFF INC	MONITORING		X	X		
594160	Evergreen Resource Management		12/8/2014	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
594162	Evergreen Resource Management		12/10/2014	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
594163	Evergreen Resource Management		12/5/2014	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
594164	Evergreen Resource Management	3102 S 26th St	1/7/2015	Other	PARRATT-WOLFF INC	MONITORING		X	X		
594165	Evergreen Resource Management	3100 S 26th St	1/6/2015	Other	PARRATT-WOLFF INC	MONITORING		X	X		
594650	Evergreen Resource Management	3106 S 26th St	1/8/2015	Other	PARRATT-WOLFF INC	MONITORING		X	X		

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Well Search Results (2025) - Pennsylvania Groundwater Information System (PaGWIS)

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594710	Evergreen Resource Management	3100 S 26th St	1/7/2015	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
594711	Evergreen Resource Management	3100 S 26th St	1/8/2015	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
594712	Evergreen Resource Management	3102 S 26th St	1/9/2015	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
596204	Evergreen Resource Management		12/9/2014	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
596660	Evergreen Resource Management	3118 S 26th St	1/13/2015	Other	PARRATT-WOLFF INC	MONITORING		X	X		
596661	Evergreen Resource Management	3112 S 26th St	1/12/2015	Other	PARRATT-WOLFF INC	MONITORING		X	X		
596905	SUN COMPANY INC.	2601 PENROSE AVE.	10/15/2012	New Well	EICHELBERGERS INC.	OBSERVATION		X	X		
604316	Abandoned salvage yard	ESSINGTON AVE NEAR 67TH ST	5/8/2006	New Well	B. L. MYERS BROS OF MD,LLC	MONITORING	LAT-LONG IS FOR INTRSXN OF ESSINGTON AND 67TH.DRILLER'S SKETCH SUGGESTS NORWITCH DR INTERSECTS ESSINGTON, BUT IT DOESN'T.INTERNET SEARCH DONE IN FEB 2020 SHOWS A SALVAGE YD AT 6796 ESSINGTON AND A USE	X			
605248	Former Passyunk Homes - PHILA HOUSING AUTHORITY	NR PATTISON AND PENROSE AVES	11/23/2005	New Well	B. L. MYERS BROS OF MD,LLC	MONITORING	MW1. FMR PASSYUNK HOMES NEIGHBORHOOD WAS BUILT IN THE 1940S FOR RETURNING WW2 SVC MEMBERS. AREA BECAME BLIGHTED AND WAS TOTALLY REDEVELOPED.	X			
605249	Former Passyunk Homes - PHILA HOUSING AUTHORITY	NR PATTISON AND PENROSE	11/23/2005	New Well	B. L. MYERS BROS OF MD,LLC	MONITORING	MW2. FMR PASSYUNK HOMES NEIGHBORHOOD WAS BUILT IN THE 1940S FOR RETURNING WW2 SVC MEMBERS. AREA BECAME BLIGHTED AND WAS TOTALLY REDEVELOPED.	X			
605250	Former Passyunk Homes - PHIL HOUSING AUTHORITY	NEAR PATTISON AND PENROSE AVES	11/23/2005	New Well	B. L. MYERS BROS OF MD,LLC	MONITORING	MW3. FMR PASSYUNK HOMES NEIGHBORHOOD WAS BUILT IN THE 1940S FOR RETURNING WW2 SVC MEMBERS. AREA BECAME BLIGHTED AND WAS TOTALLY REDEVELOPED.	X			
605762	FMR PASSYUNK HOMES	FMR BIGLER TERRACE NEAR 23RD ST	11/24/1998	New Well	LUTZ ENVIRONMENTAL CO., INC.	MONITORING	PH-13.LOCATED WITHIN FMR PASSYUNK HOMES NEIGHBORHOOD BUILT AFTER WW2 AS HOUSING FOR SERVICEMEN.NEIGHBORHOOD REDEVELOPED IN EARLY 2000s.MANY STREETS WHICH EXISTED AT TIME OF WELL DRILLING NO LONGER EXI	X	X		
605763	FMR PASSYUNK HOMES AREA	FMR BIGLER TERRACE NEAR 24TH ST	11/23/1998	New Well	LUTZ ENVIRONMENTAL CO., INC.	MONITORING	PH-14.LOCATED WITHIN FMR PASSYUNK HOMES NEIGHBORHOOD BUILT AFTER WW2 AS HOUSING FOR SERVICEMEN.NEIGHBORHOOD REDEVELOPED IN EARLY 2000s.MANY STREETS WHICH EXISTED AT TIME OF WELL DRILLING NO LONGER EXI	X	X		
605764	SUN OIL - PT. BREEZE	63RD AND PASSYUNK	3/1/1989	New Well	B. L. MYERS BROS OF MD,LLC	MONITORING			X		
605765	SUN OIL - PT. BREEZE	63RD AND PASSYUNK	3/1/1989	New Well	B. L. MYERS BROS OF MD,LLC	MONITORING		X	X		
605766	SUN OIL - PT. BREEZE	63RD AND PASSYUNK	3/1/1989	New Well	B. L. MYERS BROS OF MD,LLC	MONITORING	MW-3	X	X		
605767	SUN OIL - PT. BREEZE	63RD AND PASSYUNK	3/1/1989	New Well	B. L. MYERS BROS OF MD,LLC	MONITORING	MW-4	X	X		
605768	SUN OIL - PT. BREEZE	63RD AND PASSYUNK	3/1/1989	New Well	B. L. MYERS BROS OF MD,LLC	MONITORING	MW-5	X	X		
616914	US NAVY	PHILADELPHIA NAVAL BASE	6/25/2008	Well Abandonment	EICHELBERGERS INC.	ABANDONED	MATERIALS USED TO ABANDON 4" WELL: 94 LBS CEMENT, 20 LBS BENTONITE, 25 LBS HOLEPLUG, 6 GAL WATER. METHOD OF ABANDONMENT: PUMP THROUGH TREMIE PIPE AT WELL BOTTOM.	X			
616998	US NAVY	PHILADELPHIA NAVAL BASE	6/25/2008	Well Abandonment	EICHELBERGERS INC.	ABANDONED	MATERIALS USED TO ABANDON 4" WELL: 94 LBS CEMENT, 20 LBS BENTONITE, 25 LBS HOLEPLUG, 6 GAL WATER. METHOD OF ABANDONMENT: PUMP THROUGH TREMIE PIPE AT WELL BOTTOM.	X			

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616999	US NAVY	PHILADELPHIA NAVAL BASE	6/25/2008	Well Abandonment	EICHELBERGERS INC.	ABANDONED	MATERIALS USED TO ABANDON 4" WELL: 120 LBS CEMENT, 20 LBS BENTONITE, 25 LBS HOLEPLUG, 7 GAL WATER. METHOD OF ABANDONMENT: PUMP THROUGH TREMIE PIPE AT WELL BOTTOM.	X			
617000	US NAVY	PHILADELPHIA NAVAL BASE	6/25/2008	Well Abandonment	EICHELBERGERS INC.	ABANDONED	MATERIALS USED TO ABANDON 4" WELL: 120 LBS CEMENT, 20 LBS BENTONITE, 25 LBS HOLEPLUG, 7 GAL WATER. METHOD OF ABANDONMENT: PUMP THROUGH TREMIE PIPE AT WELL BOTTOM.	X			
617001	US NAVY	PHILADELPHIA NAVAL BASE	6/25/2008	Well Abandonment	EICHELBERGERS INC.	ABANDONED	MATERIALS USED TO ABANDON 4" WELL: 75 LBS CEMENT, 8 LBS BENTONITE, 25 LBS HOLEPLUG, 4 GAL WATER. METHOD OF ABANDONMENT: PUMP THROUGH TREMIE PIPE AT WELL BOTTOM.	X			
617002	US NAVY	PHILADELPHIA NAVAL BASE	6/25/2008	Well Abandonment	EICHELBERGERS INC.	ABANDONED	MATERIALS USED TO ABANDON 4" WELL: 75 LBS CEMENT, 8 LBS BENTONITE, 25 LBS HOLEPLUG, 4 GAL WATER. METHOD OF ABANDONMENT: PUMP THROUGH TREMIE PIPE AT WELL BOTTOM.	X			
617003	US NAVY	PHILADELPHIA NAVAL BASE	6/25/2008	Well Abandonment	EICHELBERGERS INC.	ABANDONED	MATERIALS USED TO ABANDON 4" WELL: 94 LBS CEMENT, 8 LBS BENTONITE, 25 LBS HOLEPLUG, 6 GAL WATER. METHOD OF ABANDONMENT: PUMP THROUGH TREMIE PIPE AT WELL BOTTOM.	X			
618280	US NAVY	PHILADELPHIA NAVAL BASE	6/25/2008	Well Abandonment	EICHELBERGERS INC.	ABANDONED	MATERIALS USED TO ABANDON 2" WELL: 47 LBS CEMENT, 10 LBS BENTONITE, 25 LBS HOLEPLUG, 3 GAL WATER. METHOD OF ABANDONMENT: PUMP THROUGH TREMIE PIPE AT WELL BOTTOM.	X			
618281	US NAVY	PHILADELPHIA NAVAL BASE	6/25/2008	Well Abandonment	EICHELBERGERS INC.	ABANDONED	MATERIALS USED TO ABANDON 2" WELL: 47 LBS CEMENT, 10 LBS BENTONITE, 25 LBS HOLEPLUG, 3 GAL WATER. METHOD OF ABANDONMENT: PUMP THROUGH TREMIE PIPE AT WELL BOTTOM.	X			
618282	US NAVY	PHILADELPHIA NAVAL BASE	6/25/2008	Well Abandonment	EICHELBERGERS INC.	ABANDONED	MATERIALS USED TO ABANDON 4" WELL: 120 LBS CEMENT, 20 LBS BENTONITE, 25 LBS HOLEPLUG, 7 GAL WATER. METHOD OF ABANDONMENT: PUMP THROUGH TREMIE PIPE AT WELL BOTTOM.	X			
618283	US NAVY	PHILADELPHIA NAVAL BASE	6/25/2008	Well Abandonment	EICHELBERGERS INC.	ABANDONED	MATERIALS USED TO ABANDON 4" WELL: 75 LBS CEMENT, 8 LBS BENTONITE, 25 LBS HOLEPLUG, 5 GAL WATER. METHOD OF ABANDONMENT: PUMP THROUGH TREMIE PIPE AT WELL BOTTOM.	X			
618284	US NAVY	PHILADELPHIA NAVAL BASE	6/25/2008	Well Abandonment	EICHELBERGERS INC.	ABANDONED	MATERIALS USED TO ABANDON 4" WELL: 140 LBS CEMENT, 15 LBS BENTONITE, 25 LBS HOLEPLUG, 9 GAL WATER. METHOD OF ABANDONMENT: PUMP THROUGH TREMIE PIPE AT WELL BOTTOM.	X			
618285	US NAVY	PHILADELPHIA NAVAL BASE	6/25/2008	Well Abandonment	EICHELBERGERS INC.	ABANDONED	MATERIALS USED TO ABANDON 4" WELL: 140 LBS CEMENT, 15 LBS BENTONITE, 25 LBS HOLEPLUG, 9 GAL WATER. METHOD OF ABANDONMENT: PUMP THROUGH TREMIE PIPE AT WELL BOTTOM.	X			
619958	Philadelphia Gas Works	2822 W Porter St	6/29/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-15 2 Inch PVC x 33 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
619959	Philadelphia Gas Works	2822 W Porter St	6/29/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-16 2 Inch PVC x 33 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
619960	Gas Works Philadelphia	2830 Ernest St	6/22/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well - AS-07 2" PVC x 31'' Deep w/3'' .020 V-Wire Screen	X			
619967	Philadelphia Gas Works	2822 W Porter St	6/23/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-24 2 Inch PVC x 33 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
619968	Philadelphia Gas Works	2820 W Porter St	6/23/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-25 2 Inch PVC x 33 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		

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619969	Philadelphia Gas Works	2820 W Porter St	6/18/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-27 2 Inch PVC x 33 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
619970	Philadelphia Gas Works	2818 W Porter St	6/17/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-28 2 Inch PVC x 33 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
619971	Philadelphia Gas Works	2822 W Porter St	6/16/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-31 2 Inch PVC x 33 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
619972	Philadelphia Gas Works	2401 S 28th St	6/12/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-33 2 Inch PVC x 33 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
619973	Philadelphia Gas Works	2401 S 28th St	6/17/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-34 2 Inch PVC x 33 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
619974	Philadelphia Gas Works	2401 S 28th St	6/11/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-35 2 Inch PVC x 33 Deep Deep w/3 Deep .020 V-Wire Screen	X	X		
619975	Philadelphia Gas Works	2401 S 28th St	6/11/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-36 2 Inch PVC x 33 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
619979	Philadelphia Gas Works	2521 S Newkirk St	6/15/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-01 2 Inch PVC x 33 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
619980	Philadelphia Gas Works	2519 S Newkirk St	6/16/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-02 2 Inch PVC x 35 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620002	Philadelphia Gas Works	2830 Ernest St	6/24/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-10 2 Inch PVC x 32 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620003	Philadelphia Gas Works	2830 Ernest St	6/25/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-12 2 Inch PVC x 32 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620038	Philadelphia Gas Works	2830 Ernest St	6/23/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-09 2 Inch PVC x 30.5 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620048	Philadelphia Gas Works	2830 Ernest St	6/24/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-11 2 Inch PVC x 30 Feet Deep w/3 Feet. 020 V-Wire Screen	X	X		
620050	Philadelphia Gas Works	2830 Ernest St	6/23/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-08 2 Inch PVC x 31.5 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620051	Philadelphia Gas Works	2822 W Porter St	6/30/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-19 2 Inch PVC x 33 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620055	Philadelphia Gas Works	2830 Ernest St	6/18/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-04 2 Inch PVC x 33 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620056	Philadelphia Gas Works	2830 Ernest St	6/19/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-06 2 Inch PVC x 33 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620057	Philadelphia Gas Works	2830 Ernest St	6/26/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-13 2 Inch PVC x 31 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620059	Philadelphia Gas Works	2830 Ernest St	6/26/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-14 2 Inch PVC x 31 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620064	Philadelphia Gas Works	2830 Ernest St	6/19/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-05 2 Inch PVC x 34 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620068	Philadelphia Gas Works	2818 W Porter St	6/12/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-32 2 Inch PVC x 33 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620069	Philadelphia Gas Works	2401 S 28th St	6/10/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-37 2 Inch PVC x 34 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620070	Philadelphia Gas Works	2401 S 28th St	6/10/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-38 2 Inch PVC x 34 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620071	Philadelphia Gas Works	2822 W Porter St	6/26/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-21 2 Inch PVC x 35.5 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620078	Philadelphia Gas Works	2511 S Newkirk St	6/17/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-03 2 Inch PVC x 34 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620079	Philadelphia Gas Works	2814 W Porter St	6/17/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-29 2 Inch PVC x 33 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620080	Philadelphia Gas Works	2814 W Porter St	6/16/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-30 2 Inch PVC x 33 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		

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620090	Philadelphia Gas Works	2822 W Porter St	6/29/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-20 2 Inch PVC x 33 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620277	Philadelphia Gas Works	2830 Ernest St	6/22/2015	New Well	East Coast Drilling, Inc.	OTHER	Soil Vapor Extraction Well SVE-02 2 Inch PVC x 20 Feet Deep w/5 Feet .020 V-Wire Screen	X	X		
620278	Philadelphia Gas Works	2830 Ernest St	6/25/2015	New Well	East Coast Drilling, Inc.	OTHER	Soil Vapor Extraction Well SVE-03 2 Inch PVC x 18.5 Feet Deep w/5 Feet .020 V-Wire Screen	X	X		
620291	Philadelphia Gas Works	2818 W Porter St	6/25/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-22 2 Inch PVC x 34 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620292	Philadelphia Gas Works	2822 W Porter St	6/25/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-23 2 Inch PVC x 32 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620293	Philadelphia Gas Works	2818 W Porter St	6/22/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-26 2 Inch PVC x 35.5 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620294	Philadelphia Gas Works	2822 W Porter St	6/30/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-18 2 Inch PVC x 35.5 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620300	Philadelphia Gas Works	2822 W Porter St	6/30/2015	New Well	East Coast Drilling, Inc.	OTHER	Soil Vapor Extraction Well SVE-04 2 Inch PVC x 22 Feet Deep w/5 Feet .020 V-Wire Screen	X	X		
620301	Philadelphia Gas Works	2822 W Porter St	6/26/2015	New Well	East Coast Drilling, Inc.	OTHER	Soil Vapor Extraction Well SVE-05 2 Inch PVC x 21 Feet Deep w/5 Feet .020 V-Wire Screen	X	X		
620327	Philadelphia Gas Works	2822 W Porter St	6/30/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-17 2 Inch PVC x 35.5 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620328	Philadelphia Gas Works	2830 Ernest St	6/22/2015	New Well	East Coast Drilling, Inc.	OTHER	Air Sparge Well AS-07 2 Inch PVC x 31 Feet Deep w/3 Feet .020 V-Wire Screen	X	X		
620342	Philadelphia Gas Works	2830 Ernest St	6/16/2015	New Well	East Coast Drilling, Inc.	OTHER	Soil Vapor Extraction Well SVE-01 2 Inch PVC x 19 Feet Deep w/5 Feet .020 V-Wire Screen	X	X		
620348	Philadelphia Gas Works	2401 S 28th St	6/29/2015	New Well	East Coast Drilling, Inc.	OTHER	Soil Vapor Extraction Well SVE-09 2 Inch PVC x 21 Feet Deep w/5 Feet .020 V-Wire Screen	X	X		
620349	Philadelphia Gas Works	2818 W Porter St	6/22/2015	New Well	East Coast Drilling, Inc.	OTHER	Soil Vapor Extraction Well SVE-06 2 Inch PVC x 20 Deep w/5 Deep .020 V-Wire Screen	X	X		
620350	Philadelphia Gas Works	2818 W Porter St	6/18/2015	New Well	East Coast Drilling, Inc.	OTHER	Soil Vapor Extraction Well SVE-07 2 Inch PVC x 20 Feet Deep w/5 Feet .020 V-Wire Screen	X	X		
620351	Philadelphia Gas Works	2401 S 28th St	6/15/2015	New Well	East Coast Drilling, Inc.	OTHER	Soil Vapor Extraction Well SVE-08 2 Inch PVC x 20 Feet Deep w/5 Feet .020 V-Wire Screen	X	X		
623478	Evergreen Resources Group, LLC	3144 Passyunk Avenue	2/27/2015	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
623479	Evergreen Resources Group, LLC	3144 Passyunk Avenue	2/26/2015	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
623634	Evergreen Resources Group, LLC	1708 Mingo Avenue	6/23/2015	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
623779	Evergreen Resources Group, LLC	3144 Passyunk Avenue	2/20/2015	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
623780	Evergreen Resources Group, LLC	3144 Passyunk Avenue	3/3/2015	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
623945	Evergreen Resources Group, LLC	1708 Mingo Avenue	7/27/2015	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
625163	FMR ESSINGTON PATRIOT L.P. - PHILA WHOLESALE PRODUCE MARKET	6700 ESSINGTON AVE.	11/3/2006	New Well	EICHELBERGERS INC.	OBSERVATION	LAT-LONG APPROX TO SITE. WELL APPEARS TO HAVE ORIGINALLY BEEN DRILLED FOR A FORMER PATRIOT PARKING FACILITY (POSSIBLE ENV ASSESSMENT), WHICH HAS SINCE BEEN REDEVELOPED AS THE PHILADELPHIA WHOLESALE PR	X			
625164	FMR ESSINGTON PATRIOT, L.P. - PHILA WHOLESALE PRODUCE MARKET	6700 ESSINGTON AVE.	11/3/2006	New Well	EICHELBERGERS INC.	OBSERVATION	LAT-LONG APPROX TO SITE. WELL APPEARS TO HAVE ORIGINALLY BEEN DRILLED FOR A FORMER PATRIOT PARKING FACILITY (POSSIBLE ENV ASSESSMENT), WHICH HAS SINCE BEEN REDEVELOPED AS THE PHILADELPHIA WHOLESALE PR	X			
625489	FMR ESSINGTON PATRIOT, L.P. - PHILA WHOLESALE PRODUCE MARKET	6700 ESSINGTON AVE.	11/3/2006	New Well	EICHELBERGERS INC.	OBSERVATION	LAT-LONG APPROX TO SITE. WELL APPEARS TO HAVE ORIGINALLY BEEN DRILLED FOR A FORMER PATRIOT PARKING FACILITY (POSSIBLE ENV ASSESSMENT), WHICH HAS SINCE BEEN REDEVELOPED AS THE PHILADELPHIA WHOLESALE PR	X			
635716	SUNOCO	2601 PENROSE AVE.	2/6/2003	New Well	EICHELBERGERS INC.	OBSERVATION	WELL ID: MW17	X	X		
636002	SUNOCO	2601 PENROSE AVE.	2/6/2003	New Well	EICHELBERGERS INC.	OBSERVATION	WELL ID: MW18	X	X		

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636003	SUNOCO	2601 PENROSE AVE.	2/6/2003	New Well	EICHELBERGERS INC.	OBSERVATION	WELL ID: MW19	X	X		
638317	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
640074	Evergreen		2/24/2016	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
640444	Evergreen	3450 S 26th St	2/8/2016	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
640467	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
640522	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
640523	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
640524	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641541	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641542	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641543	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641544	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641545	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		

Table 1
Well Search Results (2025) - Pennsylvania Groundwater Information System (PaGWIS)

PaGWIS Database Information								Data Analysis			
PA Well ID	**Original Owner**	**Well Address**	**Date Drilled**	**Activity Type**	**Driller**	**Well Use**	**Remarks**	**Well excluded based of WellUSe, WaterUse, TypeOfActivity, or Remark**	**Well excluded based on review of Ownership Information**	**Well excluded based on review of Paper Log/ Duplicate record**	**Well excluded based upon location outside search radius**
641546	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641547	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641548	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641549	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641550	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641551	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641552	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641553	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641554	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641555	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641608	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		

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PA Well ID	**Original Owner**	**Well Address**	**Date Drilled**	**Activity Type**	**Driller**	**Well Use**	**Remarks**	**Well excluded based of WellUSe, WaterUse, TypeOfActivity, or Remark**	**Well excluded based on review of Ownership Information**	**Well excluded based on review of Paper Log/ Duplicate record**	**Well excluded based upon location outside search radius**
641609	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641610	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641611	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641612	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641613	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641615	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641616	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641617	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641618	121 Point Breeze Terminal	6301 Pssyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641619	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
641620	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		

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641622	121 Point Breeze Terminal	6301 Passyunk Ave	12/18/2014	Well Abandonment	ALLIED WELL DRILLING	ABANDONED	Rt 202 and Rt 1, take Rt. 1 east, right onto Rt. 322 to RT 95N, get off Island Ave onto Bartram Ave to Essington Ave which turns into Passyunk Ave to 6301.	X	X		
642820	Evergreen Resources Group, LLC		8/5/2016	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
642821	Evergreen Resources Group, LLC		8/4/2016	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
642822	Evergreen Resources Group, LLC		8/4/2016	New Well	PARRATT-WOLFF INC	OTHER			X		
642823	Evergreen Resources Group, LLC		8/9/2016	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
642893	Evergreen Resources Group, LLC		8/9/2016	New Well	PARRATT-WOLFF INC	MONITORING		X	X	X	X
642905	Evergreen Resources Group, LLC		8/8/2016	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
643399	Evergreen Resources Group, LLC		8/17/2016	New Well	PARRATT-WOLFF INC	OTHER			X		
643400	Evergreen Resources Group, LLC		8/23/2016	New Well	PARRATT-WOLFF INC	OTHER			X		
643401	Evergreen Resources Group, LLC		7/25/2016	New Well	PARRATT-WOLFF INC	OTHER			X		
643617	Philadelphia Gas Works	W. Porter Street	9/12/2016	New Well	East Coast Drilling, Inc.	MONITORING	MW-B 2-inch PVC x 34-Feet Deep w/ 20-Feet .010 Screen	X	X		
643638	Philadelphia Gas Works	Walter Street	9/12/2016	New Well	East Coast Drilling, Inc.	MONITORING	MW-C 2-inch PVC x 35-Feet Deep w/ 20-Feet .010 Screen	X	X		
643672	Philadelphia Gas Works	Porter Station 28th Street	9/13/2016	New Well	East Coast Drilling, Inc.	MONITORING	MW-A 2-inch PVC x 33-Feet Deep w/ 20-Feet .010 Screen	X	X		
644031	Evergreen Resources Group, LLC		9/6/2016	New Well	PARRATT-WOLFF INC	OTHER			X		
644102	Evergreen Resources Group, LLC		9/20/2016	New Well	PARRATT-WOLFF INC	OTHER			X		
644103	Evergreen Resources Group, LLC		9/15/2016	New Well	PARRATT-WOLFF INC	OTHER			X		
644104	Evergreen Resources Group, LLC		9/14/2016	New Well	PARRATT-WOLFF INC	OTHER			X		
644106	Evergreen Resources Group, LLC		9/27/2016	New Well	PARRATT-WOLFF INC	OTHER			X		
650469	USACE	Pattison Avenue and S 20th Street	4/6/2017	New Well	EICHELBERGERS INC.	TEST	FDR DW-15	X			
650855	USACE	S 20th and Hartranft Streets	4/21/2017	New Well	EICHELBERGERS INC.	TEST	NOVA DW-14	X			
653648	Delaware Valley Recycling, Inc	3107 S 61st Street	8/31/2017	New Well	ALLIED WELL DRILLING	MONITORING	Located off S 61st Street between Passyunk Ave and Eastwick Ave.	X			
653649	Delaware Valley Recycling, Inc	3107 S 61st Street	8/31/2017	New Well	ALLIED WELL DRILLING	MONITORING	Located off S 61st Street between Passyunk Ave and Eastwick Ave.	X			
653650	Delaware Valley Recycling, Inc	3107 S 61st Street	9/5/2017	New Well	ALLIED WELL DRILLING	MONITORING	Located off S 61st Street between Passyunk Ave and Eastwick Ave.	X			
653657	Delaware Valley Recycling, Inc	3107 S 61st Street	9/1/2017	New Well	ALLIED WELL DRILLING	MONITORING	Located off S 61st Street between Passyunk Ave and Eastwick Ave.	X			
665019	Avis Rent a Car System LLC	6615 Norwitch Drive	7/27/2018	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	This well was installed using a 2 inch pre pack well	X			
665020	Avis Rent a Car System LLC	6615 Norwitch Drive	7/27/2018	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	This well was installed using a 2 inch pre pack well	X			
665021	Avis Rent a Car System LLC	6615 Norwitch Drive	7/27/2018	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	This well was installed using a 2 inch pre pack well	X			
667576	Philadelphia Energy Solutions		9/18/2018	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
667599	Philadelphia Energy Solutions		9/19/2018	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
668671	Philadelphia Energy Solutions	3518 Schuylkill Ave	9/28/2018	New Well	PARRATT-WOLFF INC	MONITORING	Monitoring well is located within refining complex between Schuylkill River and Schuylkill Avenue, and approx. 3300 feet south from intersection of Frontage Road and Schuylkill Avenue.	X	X		
668750	Philadelphia Energy Solutions	3542 Schuylkill Ave	9/28/2018	New Well	PARRATT-WOLFF INC	MONITORING	Monitoring well is located between river and Schuylkill Ave., within the PES refining complex and about 4000 feet south from the intersection of Frontage Road and Schuylkill Avenue.	X	X		
672963	DANBRO L.P. - DANBRO DISTRIBUTORS	3700 S 26TH ST, PHILA	7/2/2004	New Well	B. L. MYERS BROS OF MD,LLC	MONITORING	LAT AND LONG ARE FOR LOCATION OF OFFICE BLDG ASSOCIATED WITH THIS BUSINESS ADDRESS; WELL SHOULD BE LOCATED IN CLOSE PROXIMITY BUT SHOULD BE FIELD VERIFIED. WELL LOCATION ALSO ASSOCIATED WITH D'ANGELO	X			
673490	PBF Logistics	6850 Essington Avenue	1/18/2019	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	Installation of a 6 inch monitoring well with a 2 foot stickup.	X			
673491	PBF Logistics	6850 Essington Avenue	1/18/2019	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	Installation of a 6 inch monitoring well with a 2 foot stickup.	X			

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673492	PBF Logistics	6850 Essington Avenue	1/18/2019	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	Installation of a 6 inch monitoring well with a 2 foot stickup.	X			
673493	PBF Logistics	6850 Essington Avenue	1/18/2019	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	Installation of a 6 inch monitoring well with a 2 foot stickup.	X			
673514	PBF Logistics	6850 Essington Avenue	1/17/2019	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	Installation of a 6 inch monitoring well with a 2 foot stickup.	X			
673521	PBF Logistics	6850 Essington Avenue	1/17/2019	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	Installation of a 6 inch monitoring well with a 2 foot stickup.	X			
673546	PBF Logistics	6850 Essington Avenue	1/17/2019	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	Installation of a 6 inch monitoring well with a 2 foot stickup.	X			
673565	PBF Logistics	6850 Essington Avenue	1/17/2019	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	Installation of a 6 inch monitoring well with a 2 foot stickup.	X			
673566	PBF Logistics	6850 Essington Avenue	1/17/2019	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	Installation of a 6 inch monitoring well with a 2 foot stickup.	X			
673667	PBF Logistics	6850 Essington Avenue	1/28/2019	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	Installation of a 6 inch monitoring well with a 2 foot stickup.	X			
673670	PBF Logistics	6850 Essington Avenue	1/25/2019	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	Installation of a 6 inch monitoring well with a 2 foot stickup.	X			
673675	PBF Logistics	6850 Essington Avenue	1/28/2019	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	Installation of a 6 inch monitoring well with a 4 foot stickup.	X			
673676	PBF Logistics	6850 Essington Avenue	1/28/2019	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	Installation of a 6 inch monitoring well with a 2 foot stickup.	X			
673683	PBF Logistics	6850 Essington Avenue	1/25/2019	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	Installation of a 6 inch monitoring well with a 2 foot stickup.	X			
673686	PBF Logistics	6850 Essington Avenue	1/28/2019	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	Installation of a 6 inch monitoring well with a 2 foot stickup.	X			
678981	PES	3144 Passyunk Avenue	8/12/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
678982	PES	3144 Passyunk Ave	8/8/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
678983	PES	3144 Passyunk Ave	8/7/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
679015	PES	3144 Passyunk Avenue	8/13/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
679065	PES	3144 Passyunk Avenue	8/14/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
679252	PES	3144 Passyunk Avenue	8/15/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
679253	PES	3144 Passyunk Ave	8/22/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
679254	PES	3144 Passyunk Ave	8/19/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
679537	PES	3144 Passyunk Avenue	8/27/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
679538	PES	3144 Passyunk Avenue	8/29/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
679549	PES	3144 Passyunk Avenue	8/26/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
679572	PES	3144 Passyunk Avenue	9/5/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
679575	PES	3144 Passyunk Avenue	9/4/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
679576	PES	3144 Passyunk Avenue	9/3/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
679605	PES	3144 Passyunk Avenue	8/28/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
679701	PES		9/12/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
679712	PES	3144 Passyunk Avenue	9/11/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
679715	PES	3144 Passyunk Avenue	9/10/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
679742	PES	3144 Passyunk Ave	9/11/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
680039	PES	3144 Passyunk Ave	9/19/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
680040	PES	3144 Passyunk Ave	9/18/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
680041	PES	3144 Passyunk Ave	9/17/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
680042	PES	3144 Passyunk Ave	9/18/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
680387	PES	3144 Passyunk Aveneu	9/23/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
680415	PES	3144 Passyunk Avene	9/25/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
680416	PES	3144 Passyunk Ave	9/24/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
680474	PES	3144 Passyunk Aveneu	9/24/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
680666	PES	3144 Passyunk Avenue	9/30/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
680667	PES	3144 Passyunk Ave	10/2/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		

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680683	PES	3144 Passyunk Ave	10/3/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
680684	PES	3144 Passyunk Ave	10/7/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
681031	PES		10/29/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
681036	PES		10/30/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
681061	PES		10/30/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
682860	Evergreen		12/11/2019	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
683066	FMR PASSYUNK HOMES - PHILA HOUSING AUTHORITY	OFF FMR TAYLOR TERRACE	2/26/1999	New Well	MB DRILLING LLC	MONITORING	PH-1A.LOCATED WITHIN FMR PASSYUNK HOMES NEIGHBORHOOD BUILT AFTER WW2 AS HOUSING FOR SERVICEMEN.NEIGHBORHOOD REDEVELOPED IN EARLY 2000s.MANY STREETS WHICH EXISTED AT TIME OF WELL DRILLING NO LONGER EXI	X			
683067	FMR PASSYUNK HOMES - PHILA HOUSING AUTHORITY	OFF FMR TAYLOR TERRACE	2/19/1999	New Well	MB DRILLING LLC	MONITORING	PH-2.LOCATED WITHIN FMR PASSYUNK HOMES NEIGHBORHOOD BUILT AFTER WW2 AS HOUSING FOR SERVICEMEN.NEIGHBORHOOD REDEVELOPED IN EARLY 2000s.MANY STREETS WHICH EXISTED AT TIME OF WELL DRILLING NO LONGER EXIS	X			
683068	FMR PASSYUNK HOMES - PHILA HOUSING AUTHORITY	BETWEEN FMR 23RD AND BEMBERGER TERRACES	2/22/1999	New Well	MB DRILLING LLC	MONITORING	PH-3.LOCATED WITHIN FMR PASSYUNK HOMES NEIGHBORHOOD BUILT AFTER WW2 AS HOUSING FOR SERVICEMEN.NEIGHBORHOOD REDEVELOPED IN EARLY 2000s.MANY STREETS WHICH EXISTED AT TIME OF WELL DRILLING NO LONGER EXIS	X			
683069	FMR PASSYUNK HOMES - PHILA HOUSING AUTHORITY	OFF FMR BEMBERGER TERRACE	2/22/1999	New Well	MB DRILLING LLC	MONITORING	PH-4.LOCATED WITHIN FMR PASSYUNK HOMES NEIGHBORHOOD BUILT AFTER WW2 AS HOUSING FOR SERVICEMEN.NEIGHBORHOOD REDEVELOPED IN EARLY 2000s.MANY STREETS WHICH EXISTED AT TIME OF WELL DRILLING NO LONGER EXIS	X			
683070	FMR PASSYUNK HOMES - PHILA HOUSING AUTH	BETWEEN PENROSE FERRY AND S 22ND ST	2/23/1999	New Well	MB DRILLING LLC	MONITORING	PH-5.LOCATED WITHIN FMR PASSYUNK HOMES NEIGHBORHOOD BUILT AFTER WW2 AS HOUSING FOR SERVICEMEN.NEIGHBORHOOD REDEVELOPED IN EARLY 2000s.MANY STREETS WHICH EXISTED AT TIME OF WELL DRILLING NO LONGER EXIS	X			
683071	FMR PASSYUNK HOMES - PHILA HOUSING AUTHORITY	BETWEEN PENROSE FERRY AND S 22ND ST	2/26/1999	New Well	MB DRILLING LLC	MONITORING	PH-5A.LOCATED WITHIN FMR PASSYUNK HOMES NEIGHBORHOOD BUILT AFTER WW2 AS HOUSING FOR SERVICEMEN.NEIGHBORHOOD REDEVELOPED IN EARLY 2000s.MANY STREETS WHICH EXISTED AT TIME OF WELL DRILLING NO LONGER EXI	X			
683072	FMR PASSYUNK HOMES - PHILA HOUSING AUTHORITY	OFF FMR TAYLOR TERRACE	2/25/1999	New Well	MB DRILLING LLC	MONITORING	HP-1.LOCATED WITHIN FMR PASSYUNK HOMES NEIGHBORHOOD BUILT AFTER WW2 AS HOUSING FOR SERVICEMEN.NEIGHBORHOOD REDEVELOPED IN EARLY 2000s.MANY STREETS WHICH EXISTED AT TIME OF WELL DRILLING NO LONGER EXIS	X			
683073	FMR PASSYUNK HOMES - PHILA HOUSING AUTHORITY	OFF FMR HULSEMAN TERRACE	2/24/1999	New Well	MB DRILLING LLC	MONITORING	HPS-6.LOCATED WITHIN FMR PASSYUNK HOMES NEIGHBORHOOD BUILT AFTER WW2 AS HOUSING FOR SERVICEMEN.NEIGHBORHOOD REDEVELOPED IN EARLY 2000s.MANY STREETS WHICH EXISTED AT TIME OF WELL DRILLING NO LONGER EXI	X			
683074	FMR PASSYUNK HOMES - PHILA HOUSING AUTHORITY	NEAR CNR FMR DEWITT ST AND S 20TH	3/3/1999	New Well	MB DRILLING LLC	MONITORING	MWS-10.LOCATED WITHIN FMR PASSYUNK HOMES NEIGHBORHOOD BUILT AFTER WW2 AS HOUSING FOR SERVICEMEN.NEIGHBORHOOD REDEVELOPED IN EARLY 2000s.MANY STREETS WHICH EXISTED AT TIME OF WELL DRILLING NO LONGER EX	X			

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Well Search Results (2025) - Pennsylvania Groundwater Information System (PaGWIS)

PaGWIS Database Information								Data Analysis			
PA Well ID	Original Owner	Well Address	Date Drilled	Activity Type	Driller	Well Use	Remarks	Well excluded based of WellUSe, WaterUse, TypeOfActivity, or Remark	Well excluded based on review of Ownership Information	Well excluded based on review of Paper Log/ Duplicate record	Well excluded based upon location outside search radius
683075	FMR PASSYUNK HOMES - PHILA HOUSING AUTH	ON FMR BASH ST - NO LONGER EXISTS	2/16/1999	New Well	MB DRILLING LLC	MONITORING	MWS-11.LOCATED WITHIN FMR PASSYUNK HOMES NEIGHBORHOOD BUILT AFTER WW2 AS HOUSING FOR SERVICEMEN.NEIGHBORHOOD REDEVELOPED IN EARLY 2000s.MANY STREETS WHICH EXISTED AT TIME OF WELL DRILLING NO LONGER EX	X			
683076	FMR PASSYUNK HOMES - PHILA HOUSING AUTHORITY	OFF FMR BASH ST - STREET NO LONGER EXISTS	2/16/1999	New Well	MB DRILLING LLC	MONITORING	MWS-13.LOCATED WITHIN FMR PASSYUNK HOMES NEIGHBORHOOD BUILT AFTER WW2 AS HOUSING FOR SERVICEMEN.NEIGHBORHOOD REDEVELOPED IN EARLY 2000s.MANY STREETS WHICH EXISTED AT TIME OF WELL DRILLING NO LONGER EX	X			
683077	FMR PASSYUNK HOMES - PHILA HOUSING AUTHORITY	OFF FMR BASH ST - STREET NO LONGER EXISTS	2/19/1999	New Well	MB DRILLING LLC	MONITORING	MWS-14.LOCATED WITHIN FMR PASSYUNK HOMES NEIGHBORHOOD BUILT AFTER WW2 AS HOUSING FOR SERVICEMEN.NEIGHBORHOOD REDEVELOPED IN EARLY 2000s.MANY STREETS WHICH EXISTED AT TIME OF WELL DRILLING NO LONGER EX	X			
683078	FMR PASSYUNK HOMES - PHILA HOUSING AUTHORITY	BETWEEN FMR BASH AND ROGERS STS - STS NO LONGER EXIST	2/24/1999	New Well	MB DRILLING LLC	MONITORING	MWS-15.LOCATED WITHIN FMR PASSYUNK HOMES NEIGHBORHOOD BUILT AFTER WW2 AS HOUSING FOR SERVICEMEN.NEIGHBORHOOD REDEVELOPED IN EARLY 2000s.MANY STREETS WHICH EXISTED AT TIME OF WELL DRILLING NO LONGER EX	X			
683180	PES		1/14/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
683219	PES		1/7/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
683224	PES		1/8/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
683229	PES		1/7/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
683232	PES		1/9/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
683252	PES		1/9/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
683267	PES		1/6/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
685816	Cedar Realty Trust, Inc.	2301 W. Oregon Ave.	3/17/2020	Well Abandonment	AMERIDRILL, INC.	ABANDONED		X			
685817	Cedar Realty Trust, Inc.	2301 W. Oregon Ave.	3/17/2020	Well Abandonment	AMERIDRILL, INC.	ABANDONED		X			
685851	Cedar Realty Trust, Inc.	2301 W. Oregon Ave.	3/17/2020	Well Abandonment	AMERIDRILL, INC.	ABANDONED		X			
685852	Cedar Realty Trust, Inc.	2301 W. Oregon Ave.	3/17/2020	Well Abandonment	AMERIDRILL, INC.	ABANDONED		X			
685872	Cedar Realty Trust, Inc.	2301 W. Oregon Ave.	3/17/2020	Well Abandonment	AMERIDRILL, INC.	ABANDONED		X			
685873	Cedar Realty Trust, Inc.	2261 W Shunk St	3/17/2020	Well Abandonment	AMERIDRILL, INC.	ABANDONED		X			
686335	City of Philadelphia	1500 Pattison Ave.	7/22/2024	Well Abandonment	AMERIDRILL, INC.	MONITORING		X			
686350	City of Philadelphia	1500 Pattison Ave.	10/5/2023	Well Abandonment	AMERIDRILL, INC.	MONITORING		X			
686375	City of Philadelphia	1500 Pattison Ave.	10/5/2023	Well Abandonment	AMERIDRILL, INC.	MONITORING		X			
686405	City of Philadelphia	1500 Pattison Ave.	5/20/2020	New Well	AMERIDRILL, INC.	MONITORING		X			
686408	City of Philadelphia	1500 Pattison Ave.	10/5/2023	Well Abandonment	AMERIDRILL, INC.	MONITORING		X			
686423	City of Philadelphia	1500 Pattison Ave.	7/22/2024	Well Abandonment	AMERIDRILL, INC.	MONITORING		X			
686435	City of Philadelphia	1500 Pattison Ave.	5/20/2020	New Well	AMERIDRILL, INC.	MONITORING		X			
687657	PES		6/16/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
687658	PES		7/13/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
687676	PES		7/8/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
687691	PES		6/16/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
687760	PES		6/25/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
687779	PES		7/1/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
687925	PES		8/10/2000	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
687976	PES		8/12/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
687979	PES		7/17/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
688006	PES		7/27/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
691149	Sunoco		12/1/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
691267	Sunoco		12/2/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
691482	Sunoco		12/10/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
691484	Sunoco		12/3/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		

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691554	Avis Budget Car Rental LLC	6615 Norwitch Drive	12/8/2020	Well Abandonment	ODYSSEY ENVIRONMENTAL SERVICES, INC.	ABANDONED	Monitoring well abandonment, restore surface to match existing.	X			
691555	Avis Budget Car Rental LLC	6615 Norwitch Drive	12/8/2020	Well Abandonment	ODYSSEY ENVIRONMENTAL SERVICES, INC.	ABANDONED	Vapor Point abandonment, restore surface to match existing.	X			
691578	Avis Budget Car Rental LLC	6615 Norwitch Drive	12/8/2020	Well Abandonment	ODYSSEY ENVIRONMENTAL SERVICES, INC.	ABANDONED	Monitoring well abandonment, restore surface to match existing.	X			
691668	Avis Budget Car Rental LLC	6615 Norwitch Drive	12/8/2020	Well Abandonment	ODYSSEY ENVIRONMENTAL SERVICES, INC.	ABANDONED	Monitoring well abandonment, restore surface to match existing.	X			
691989	Sunoco		12/16/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
691990	Sunoco		12/29/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
691991	Sunoco		12/14/2020	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
692563	Sunoco		1/13/2021	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
692600	Sunoco		1/7/2021	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
692601	Sunoco		1/26/2021	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
692636	Sunoco		1/12/2021	New Well	PARRATT-WOLFF INC	WITHDRAWAL			X		
692645	Sunoco		1/20/2021	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
692860	Sunoco		2/10/2021	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
692861	Sunoco		2/8/2021	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
693040	Sunoco		2/12/2021	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
693401	Sunoco		3/2/2021	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
693417	Sunoco		3/9/2021	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
693420	PES		2/19/2021	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
693429	PES		2/24/2021	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
693431	PES		2/25/2021	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
693532	Sunoco		2/23/2021	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
694547	PBF Logistics	6850 Essington Avenue	4/14/2021	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	Monitoring well re-drill and installation with a 2 foot stickup.	X			
696718	Aterra Property Group	6800 Essington Ave	7/21/2021	New Well	ENVIRONMENTAL PROBING INVESTIGATIONS	MONITORING		X			
696752	Aterra Property Group	6800 Essington Ave	7/20/2021	New Well	ENVIRONMENTAL PROBING INVESTIGATIONS	MONITORING		X			
696753	Aterra Property Group	6800Essington Ave	7/21/2021	New Well	ENVIRONMENTAL PROBING INVESTIGATIONS	MONITORING		X			
699200	Kinder Morgan Liquids Terminals LLC	6310 W Passyunk Avenue	10/28/2021	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	Installation of a monitoring well.	X			
699211	Kinder Morgan Liquids Terminals LLC	6310 W Passyunk Avenue	10/29/2021	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	Installation of a monitoring well.	X			
699251	Kinder Morgan Liquids Terminals LLC	6310 W Passyunk Avenue	10/28/2021	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	Installation of a monitoring well.	X			
699281	Kinder Morgan Liquids Terminals LLC	6310 W Passyunk Avenue	10/29/2021	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	Installation of a monitoring well.	X			
699296	Kinder Morgan Liquids Terminals LLC	6310 W Passyunk Avenue	10/29/2021	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING	Installation of a monitoring well.	X			
700547	PEs		11/29/2021	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
700617	PES		11/29/2021	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
702331	PES		2/14/2022	Well Abandonment	PARRATT-WOLFF INC	MONITORING		X	X		
704537	PES		2/9/2022	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
704547	PES		4/26/2022	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
704548	PES		4/27/2022	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
704697	PES		2/8/2022	New Well	PARRATT-WOLFF INC	MONITORING		X	X		
708632	Wheeler Real Estate Investment Trust	2129 W Oregon Ave	9/22/2022	New Well	AMERIDRILL, INC.	MONITORING		X			
708862	Hilco Redevelpment Partners (HRP)	3144 Passyunk Avenue	8/2/2023	Well Abandonment	Michael Kavlunas TOTAL QUALITY DRILLING, L.I	WITHDRAWAL		X			
709731	Wheeler Real Estate Investment Trust	2129 W Oregon Ave	12/5/2022	Well Abandonment	AMERIDRILL, INC.	ABANDONED		X			
710455	6800 Essington Partners, LLC	6800 Essington Ave	1/17/2023	New Well	ENVIRONMENTAL PROBING INVESTIGATIONS	MONITORING		X			
710479	6800 Essington Partners, LLC	6800 Essington Ave	1/17/2023	Well Abandonment	ENVIRONMENTAL PROBING INVESTIGATIONS	ABANDONED		X			

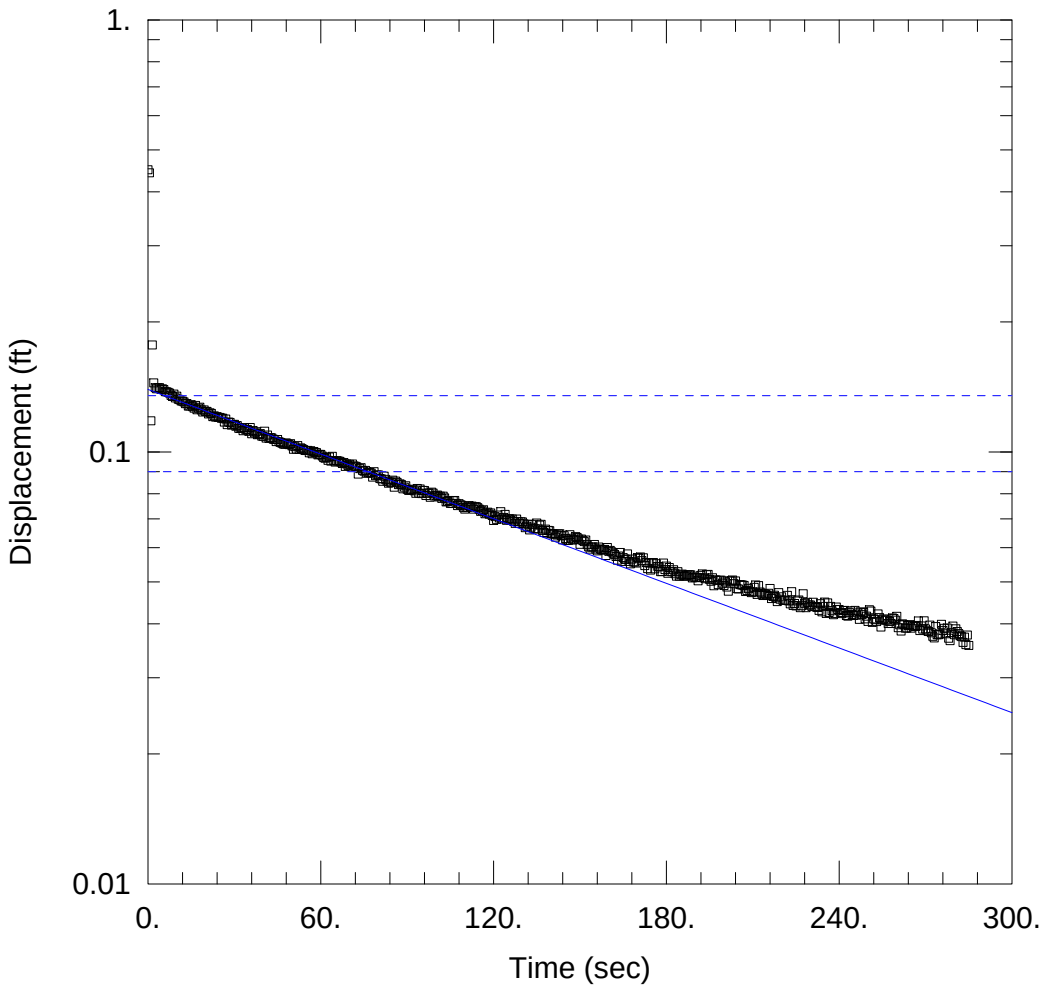
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710507	6800 Essington Partners LLC	6800 Essington Ave	1/18/2023	New Well	ENVIRONMENTAL PROBING INVESTIGATIONS	MONITORING		X			
710508	6800 Essington Partners LLC	6800 Essington Ave	1/18/2023	New Well	ENVIRONMENTAL PROBING INVESTIGATIONS	MONITORING		X			
710515	6800 Essington Partners, LLC	6800 Essington Ave	1/17/2023	New Well	ENVIRONMENTAL PROBING INVESTIGATIONS	MONITORING		X			
754223	Sunoco Evergreen Subsidiary		6/16/2023	New Well	PARRATT-WOLFF INC		Roto Sonic Drilling Sand from 18' to 55'		X		
754225	Sunoco Evergreen Subsidiary		6/20/2023	New Well	PARRATT-WOLFF INC		Roto Sonic Drilling Sand from 66' to 100'		X		
754229	Sunoco Evergreen Subsidiary		6/26/2023	New Well	PARRATT-WOLFF INC		Roto Sonic Drilling Sand from 19' to 50'		X		
754232	Sonoco Evergreen Subsidiary								X		
754262	Sunoco Evergreen Subsidiary		6/22/2023	New Well	PARRATT-WOLFF INC		Roto Sonic Drilling Sand from 18' to 50'		X		
754264	Sunoco Evergreen Subsidiary		6/21/2023	New Well	PARRATT-WOLFF INC		Roto Sonic Drilling Sand from 23' to 50'		X		
756843	PES Owner		6/27/2023	New Well	PARRATT-WOLFF INC				X		
756846	PES Owner		7/23/2024	Well Abandonment	PARRATT-WOLFF INC		Well was tremie grouted in place	X	X		
756848	PES Owner		6/29/2023	New Well	PARRATT-WOLFF INC				X		
759042	Eco Materials, LLC	6110-6130 W Passyunk Ave							X		
759056	Eco Materials, LLC	6110-6130 W Passyunk Ave	2/5/2024	New Well	ENVIROPROBE SERVICE, INC.	MONITORING		X	X		
759060	Eco Materials, LLC	6110-6130 W Passyunk Ave	2/5/2024	New Well	ENVIROPROBE SERVICE, INC.				X		
760959	Sun Company LLC	2601 Penrose Avenue							X		
760960	Sun Company Inc	2601 Penrose Avenue							X		
760961	Sun Company Inc	2601 Penrose Avenue	4/15/2024	Well Abandonment	ODYSSEY ENVIRONMENTAL SERVICES, INC.		Monitoring well abandonment, restore surface to match existing. Original well installed by BL Myers Inc.	X	X		
760962	Sun Company Inc	2601 Penrose Avenue	4/15/2024	Well Abandonment	ODYSSEY ENVIRONMENTAL SERVICES, INC.		Monitoring well abandonment, restore surface to match existing. Original well installed by BL Myers Inc.	X	X		
760963	Sun Company Inc	2601 Penrose Avenue	4/15/2024	Well Abandonment	ODYSSEY ENVIRONMENTAL SERVICES, INC.		Monitoring well abandonment, restore surface to match existing. Original well installed by BL Myers Inc.	X	X		
760967	Sun Company Inc	2601 Penrose Avenue							X		
760968	Sun Company Inc	2601 Penrose Avenue	4/15/2024	Well Abandonment	ODYSSEY ENVIRONMENTAL SERVICES, INC.		Monitoring well abandonment, restore surface to match existing. Original well installed by BL Myers Inc.	X	X		
760969	Sun Company Inc	2601 Penrose Avenue							X		
760972	Sun Company Inc	2601 Penrose Avenue	4/15/2024	Well Abandonment	ODYSSEY ENVIRONMENTAL SERVICES, INC.		Monitoring well abandonment, restore surface to match existing. Original well installed by Lutz Environmental.	X	X		
760973	Sun Company Inc	2601 Penrose Avenue	4/15/2024	Well Abandonment	ODYSSEY ENVIRONMENTAL SERVICES, INC.		Monitoring well abandonment, restore surface to match existing. Original well installed by Lutz Environmental.	X	X		
760974	Sun Company Inc	2601 Penrose Avenue	4/15/2024	Well Abandonment	ODYSSEY ENVIRONMENTAL SERVICES, INC.		Monitoring well abandonment, restore surface to match existing. Original well installed by BL Myers Inc.	X	X		
760975	Sun Company Inc	2601 Penrose Avenue	4/15/2024	Well Abandonment	ODYSSEY ENVIRONMENTAL SERVICES, INC.		Monitoring well abandonment, restore surface to match existing. Original well installed by BL Myers Inc. in 1999 and overdrilled by Eichelbergers in 2012. Refer to PA Well ID 596905 for 10-15-2012 installation report.	X	X		
760985	Sun Company Inc	2601 Penrose Avenue							X		
760986	Sun Company Inc	2601 Penrose Avenue	4/15/2024	Well Abandonment	ODYSSEY ENVIRONMENTAL SERVICES, INC.		Monitoring well abandonment, restore surface to match existing. Original well installed by BL Myers Inc.	X	X		
760987	Sun Company Inc.	2601 Penrose Avenue	4/15/2024	Well Abandonment	ODYSSEY ENVIRONMENTAL SERVICES, INC.		Monitoring well abandonment, restore surface to match existing. Original well installed by BL Myers.	X	X		
760988	Sun Company Inc	2601 Penrose Avenue	4/15/2024	Well Abandonment	ODYSSEY ENVIRONMENTAL SERVICES, INC.		Monitoring well abandonment, restore surface to match existing. Original well installed by BL Myers Inc.	X	X		

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760994	Sun Company Inc	2601 Penrose Avenue	4/15/2024	Well Abandonment	ODYSSEY ENVIRONMENTAL SERVICES, INC.		Monitoring well abandonment, restore surface to match existing. Original well installed by Eichelbergers. Refer to PA Well ID 635716 for 2-6-2003 installation report.	X	X		
760995	Sun Company Inc	2601 Penrose Avenue	4/15/2024	Well Abandonment	ODYSSEY ENVIRONMENTAL SERVICES, INC.		Monitoring well abandonment, restore surface to match existing. Original well installed by Eichelbergers Inc. Refer to PA Well ID 636002 for 2-6-2003 installation report.	X	X		
760996	Sun Company Inc.	2601 Penrose Avenue	4/15/2024	Well Abandonment	ODYSSEY ENVIRONMENTAL SERVICES, INC.		Monitoring well abandonment, restore surface to match existing. Original well installed by Eichelbergers, Inc. Refer to PA Well ID 636003 for the 2-6-2003 installation report.	X	X		
762438	NorthStar Environmental Services	6310 Passyunk Ave							X		
763070	Haley BP POINT BREEZE LLC	6310 Passyunk Ave	7/2/2024	New Well	Northstar Environmental Services	MONITORING		X	X		
763782	Haley BP POINT BREEZE LLC	6310 Passyunk Ave	7/12/2024	New Well	Northstar Environmental Services				X		
764317	PBF Logistics	6850 Essington Avenue	7/12/2024	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING		X			
764322	PBF Logistics	6850 Essington Avenue	7/12/2024	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING		X			
764327	PBF Logistics	6850 Essington Avenue	7/11/2024	New Well	ODYSSEY ENVIRONMENTAL SERVICES, INC.	MONITORING		X			
766712	PES owner		7/23/2024	Well Abandonment	PARRATT-WOLFF INC		demolition	X	X		
769832	Haley BP POINT BREEZE LLC	6310 Passyunk Ave	7/2/2024	New Well	Northstar Environmental Services				X		
770294	Haley BP POINT BREEZE LLC	6310 Passyunk Ave	3/12/2025	New Well	Northstar Environmental Services				X		
770297	Haley BP POINT BREEZE LLC	6310 Passyunk Ave	3/19/2025	New Well	Northstar Environmental Services	MONITORING		X	X		

Appendix V Slug Test Analysis Results



WELL TEST ANALYSIS

Data Set: U:\...\s283_risinghead2.aqt
Date: 06/17/25 Time: 23:43:07

PROJECT INFORMATION

Company: Stantec Consulting
Client: BDH
Project: 213403039
Location: Former PES Refinery
Test Well: S-283
Test Date: 2/22/2019

AQUIFER DATA

Saturated Thickness: 15. ft Anisotropy Ratio (Kz/Kr): 1.

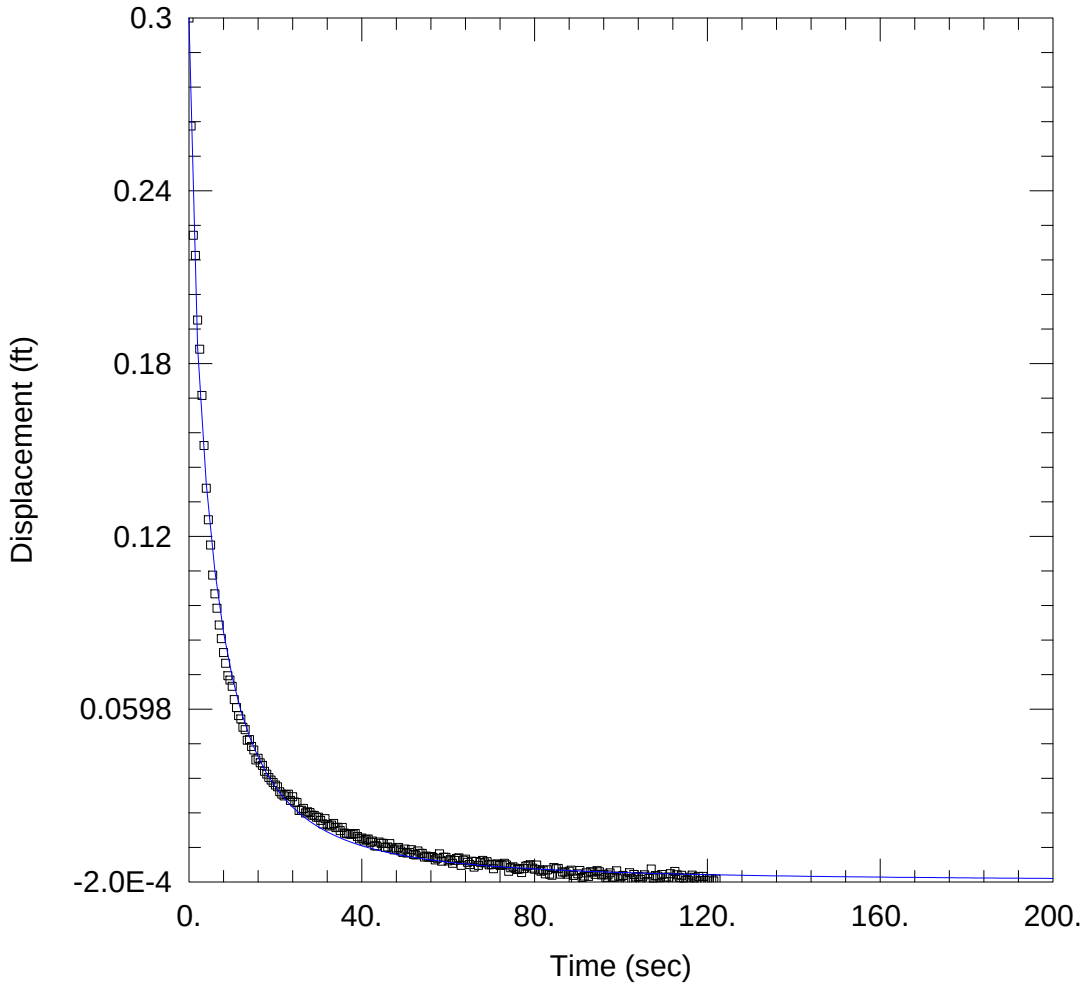
WELL DATA (S-283)

Initial Displacement: 0.45 ft
Total Well Penetration Depth: 12. ft
Casing Radius: 0.1667 ft
Static Water Column Height: 12. ft
Screen Length: 12. ft
Well Radius: 0.1667 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 1.7 ft/day y0 = 0.1395 ft



WELL TEST ANALYSIS

Data Set: U:\...\s382_risinghead1.aqt
Date: 06/17/25 Time: 15:48:34

PROJECT INFORMATION

Company: Stantec Consulting
Client: BDH
Project: 213403039
Location: Former PES Refinery
Test Well: S-382
Test Date: 2/22/2019

AQUIFER DATA

Saturated Thickness: 11. ft

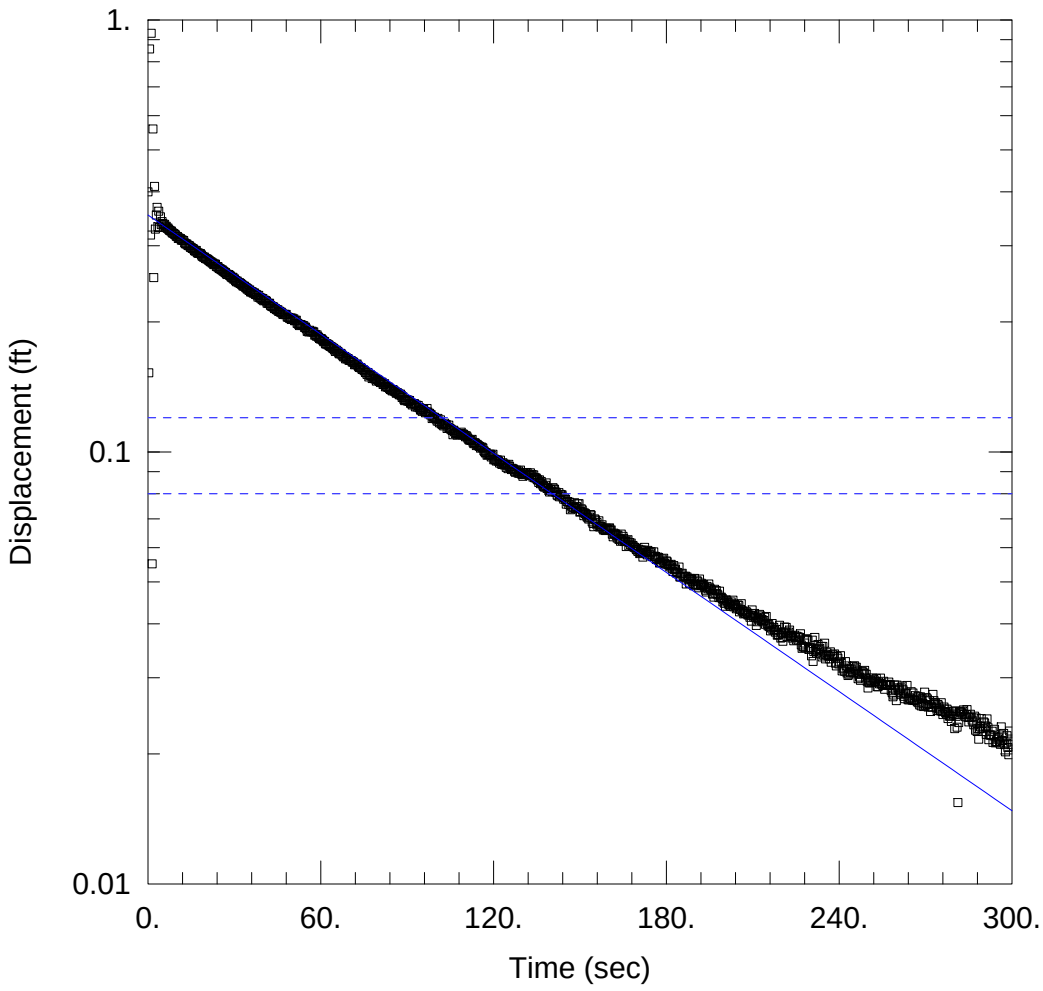
WELL DATA (S-382)

Initial Displacement: 0.3 ft
Total Well Penetration Depth: 11. ft
Casing Radius: 0.1667 ft
Static Water Column Height: 11.5 ft
Screen Length: 11. ft
Well Radius: 0.1667 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: KGS Model

Kr = 38.84 ft/day
Kz/Kr = 1.
Ss = 0.002752 ft^{-1}



WELL TEST ANALYSIS

Data Set: U:\...\s433_risinghead2.aqt
Date: 06/17/25 Time: 18:11:12

PROJECT INFORMATION

Company: Stantec Consulting
Client: BDH
Project: 213403039
Location: Former PES Refinery
Test Well: S-433
Test Date: 4/20/2020

AQUIFER DATA

Saturated Thickness: 15. ft Anisotropy Ratio (Kz/Kr): 1.

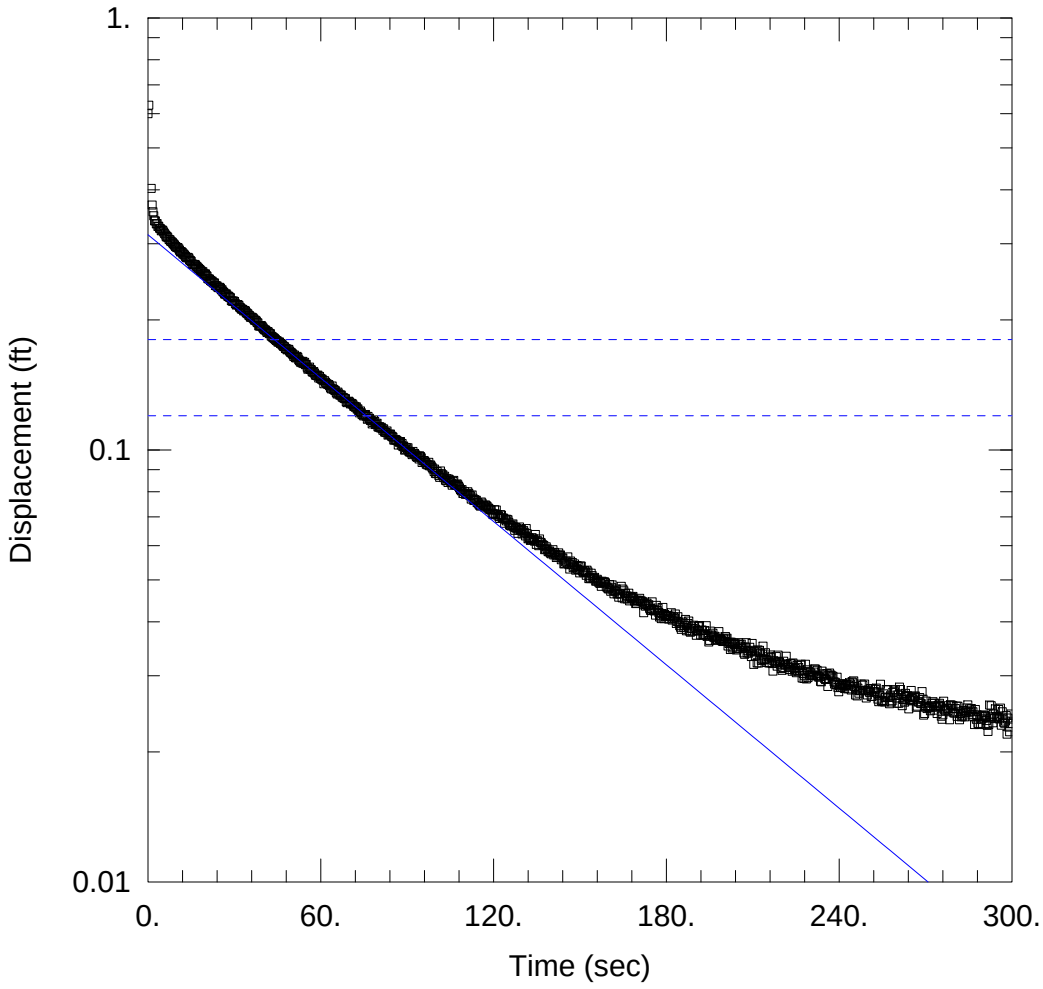
WELL DATA (S-433)

Initial Displacement: 0.4 ft
Total Well Penetration Depth: 10. ft
Casing Radius: 0.1667 ft
Static Water Column Height: 11.7 ft
Screen Length: 10. ft
Well Radius: 0.1667 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 4.977 ft/day y0 = 0.3534 ft



WELL TEST ANALYSIS

Data Set: U:\...\s434_risinghead2.aqt
Date: 06/17/25 Time: 18:38:04

PROJECT INFORMATION

Company: Stantec Consulting
Client: BDH
Project: 213403039
Location: Former PES Refinery
Test Well: S-434
Test Date: 4/20/2020

AQUIFER DATA

Saturated Thickness: 12. ft Anisotropy Ratio (Kz/Kr): 1.

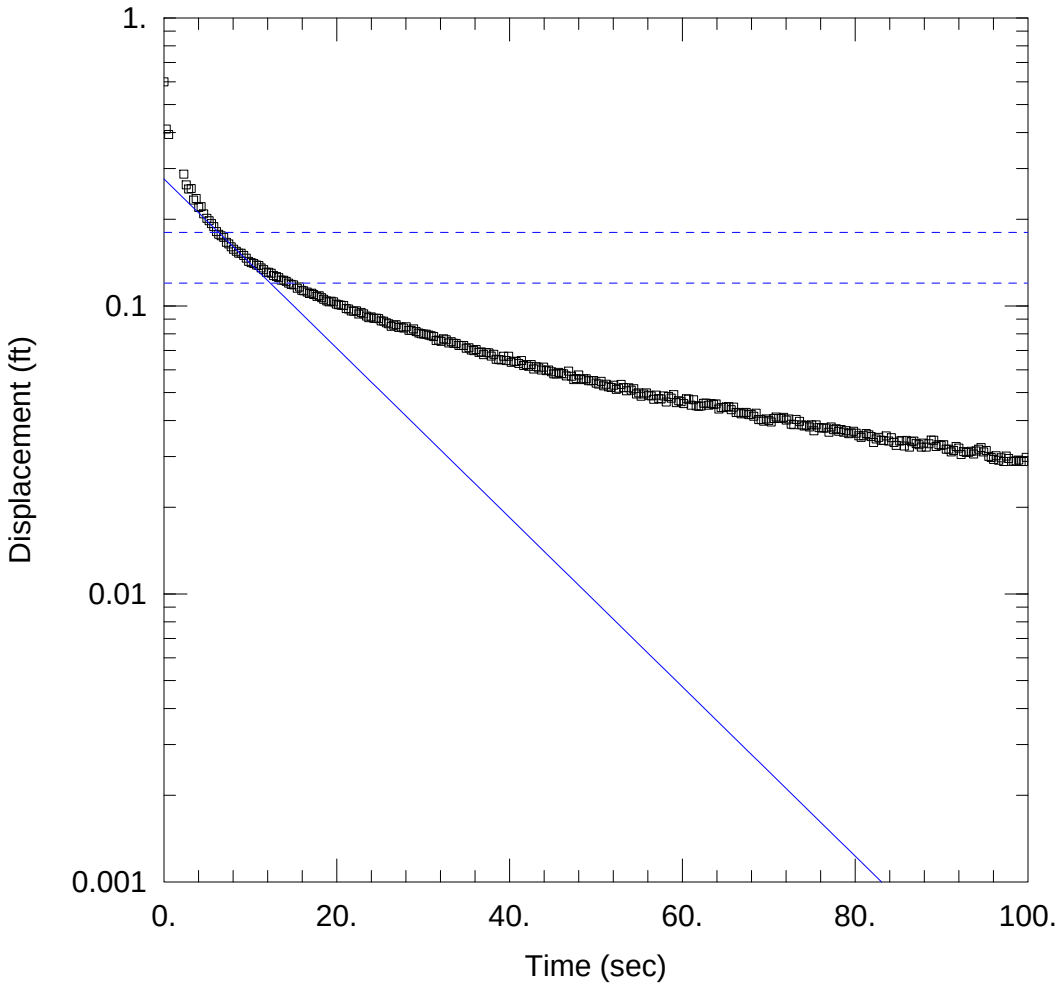
WELL DATA (S-434)

Initial Displacement: 0.6 ft
Total Well Penetration Depth: 9.6 ft
Casing Radius: 0.1667 ft
Static Water Column Height: 9.5 ft
Screen Length: 9.6 ft
Well Radius: 0.1667 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 7.048 ft/day y0 = 0.3148 ft



WELL TEST ANALYSIS

Data Set: U:\...\s435_risinghead2.aqt
Date: 06/17/25 Time: 19:10:43

PROJECT INFORMATION

Company: Stantec Consulting
Client: BDH
Project: 213403039
Location: Former PES Refinery
Test Well: S-435
Test Date: 4/20/2020

AQUIFER DATA

Saturated Thickness: 8.5 ft Anisotropy Ratio (Kz/Kr): 1.

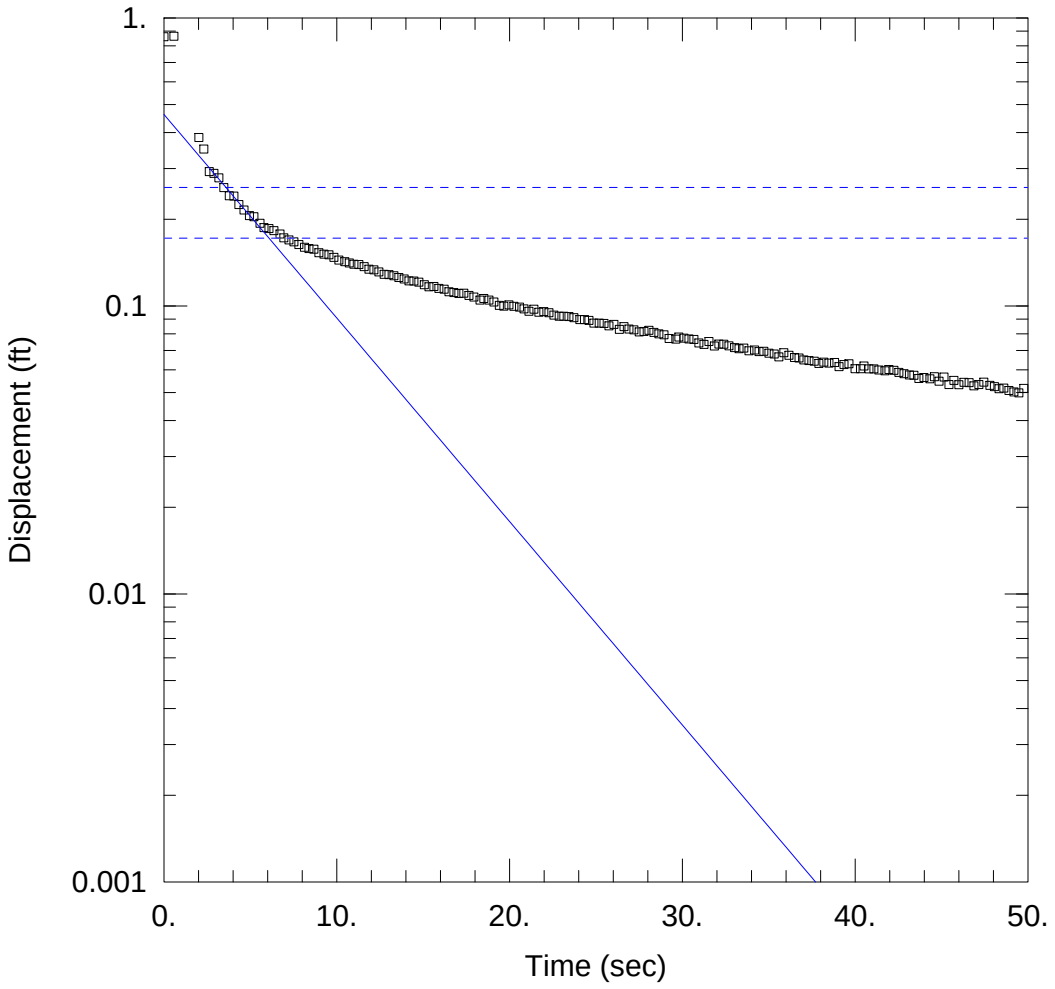
WELL DATA (S-435)

Initial Displacement: 0.6 ft
Total Well Penetration Depth: 10. ft
Casing Radius: 0.1667 ft
Static Water Column Height: 10. ft
Screen Length: 10. ft
Well Radius: 0.1667 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 53.08 ft/day y0 = 0.276 ft



WELL TEST ANALYSIS

Data Set: U:\...\s436_risinghead1.aqt
Date: 06/17/25 Time: 23:22:45

PROJECT INFORMATION

Company: Stantec Consulting
Client: BDH
Project: 213403039
Location: Former PES Refinery
Test Well: S-436
Test Date: 4/20/2020

AQUIFER DATA

Saturated Thickness: 9. ft
Anisotropy Ratio (Kz/Kr): 1.

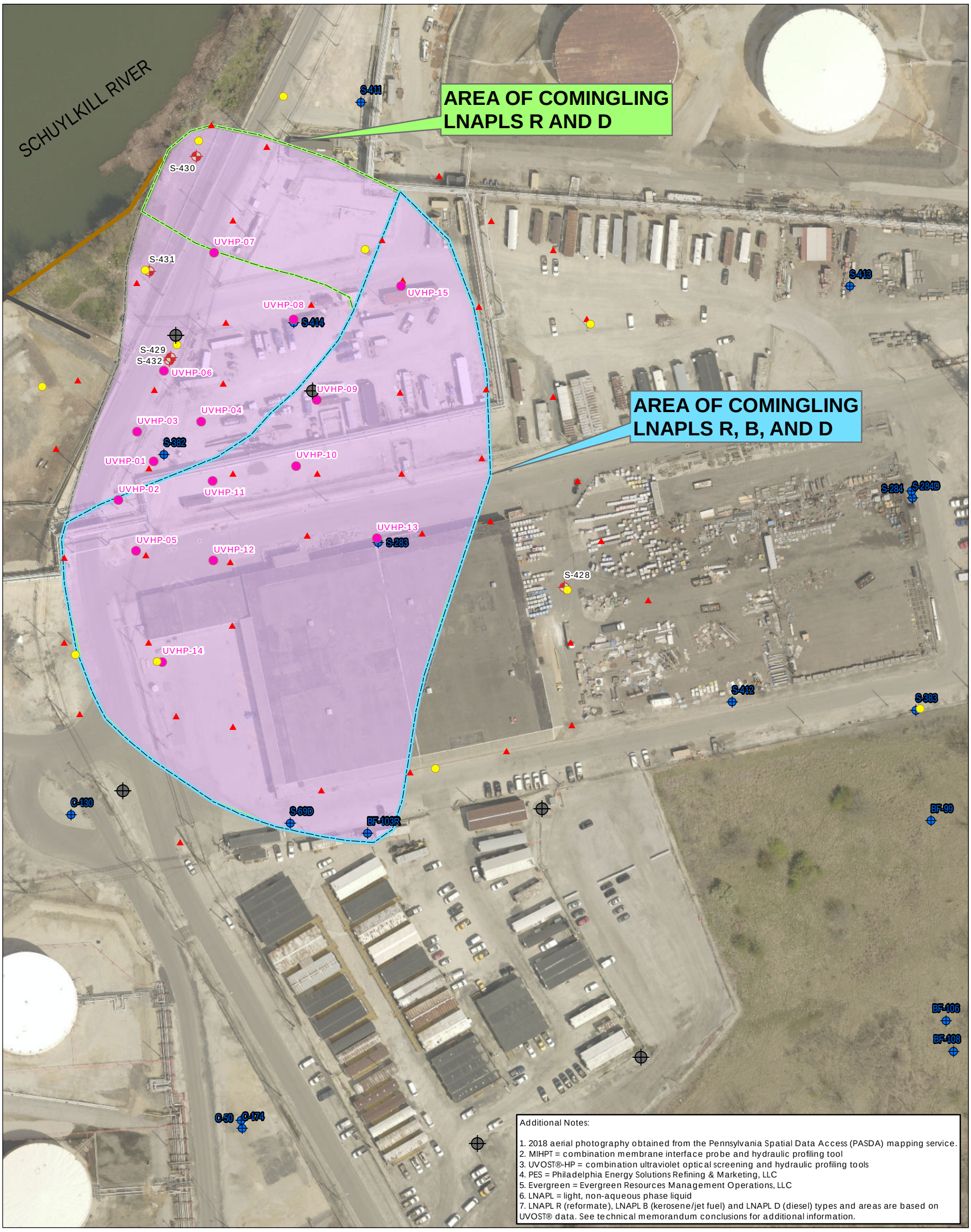
WELL DATA (S-436)

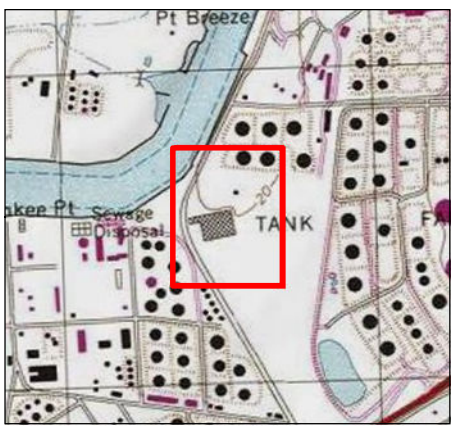
Initial Displacement: 0.86 ft
Total Well Penetration Depth: 9. ft
Casing Radius: 0.1667 ft
Static Water Column Height: 9. ft
Screen Length: 9. ft
Well Radius: 0.1667 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 70.67 ft/day
y0 = 0.4619 ft

Appendix W UVOST® Memo Figure 1 – Summary of Completed and Proposed Activities





Notes

1. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
2. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
3. Source: Stantec
4. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed © Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2015 Microsoft Corporation

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LEGEND

BORING, WELL, OR SAMPLER LOCATION

- PROPOSED PES MONITORING WELL
- EXISTING PES RECOVERY/MONITORING WELL
- MIHPT BORING
- UVOST®-HP BORING
- PASSIVE SOIL GAS SAMPLER LOCATION
- EXISTING FACILITY MONITORING WELL (EVERGREEN)
- STEEL SHEET PILING
- TIMBER SHEET PILING
- APPROXIMATE EXTENT OF REFORMATE LNAPL BODY

50 0 50 100 150 Feet

1:1,446 (At Original document size of 11x17)

N

Stantec PHILADELPHIA ENERGY SOLUTIONS

Project Location
City of Philadelphia,
Philadelphia County,
Pennsylvania

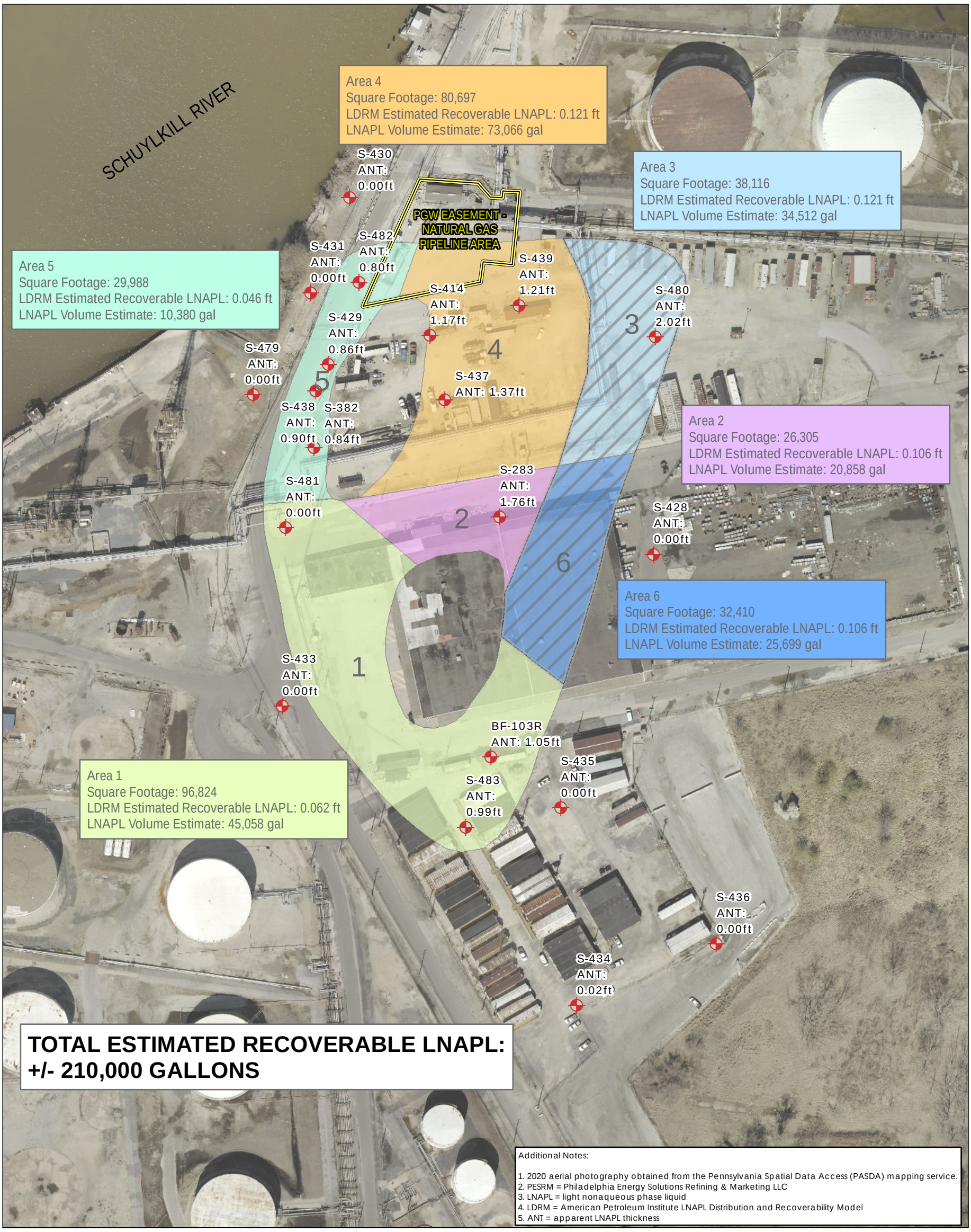
213403039
Prepared by ADK on 9/16/2019
Technical Review by JP on 9/19/2019
Independent Review by JLM on 9/23/2019

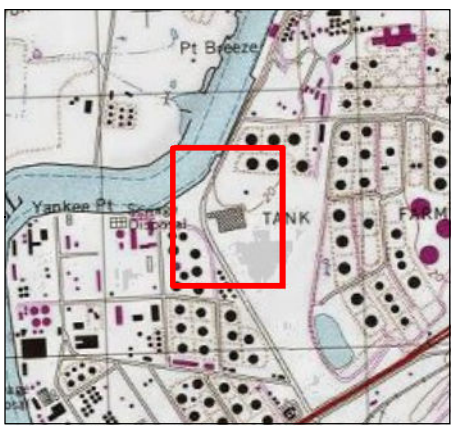
Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING, LLC
PHILADELPHIA REFINING COMPLEX
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.
1

Title
PES UDEX FEED UNDERGROUND LINE RELEASE - SUMMARY OF COMPLETED AND PROPOSED ACTIVITIES

Appendix X RDC Memo Figure 4 – UDEX Release Updated LNAPL Recoverable Volume Estimate (2022) and LDRM Analysis





Notes

1. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
2. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
3. Source: Stantec
4. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed © Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2015 Microsoft Corporation

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LEGEND

1/25/2022 WELL ANT

Monitoring Well Gauged

APPROXIMATE EXTENT OF LNAPL BODY

(Showing Sub-Areas Used for LDRM Modeling

- Area 1
- Area 2
- Area 3
- Area 4
- Area 5
- Area 6
- Area of Further Review - Middle Distillate Fuel

30 0 30 60 90 Feet

1:1,750 (At Original document size of 11x17)

N

Stantec

PHILADELPHIA ENERGY SOLUTIONS

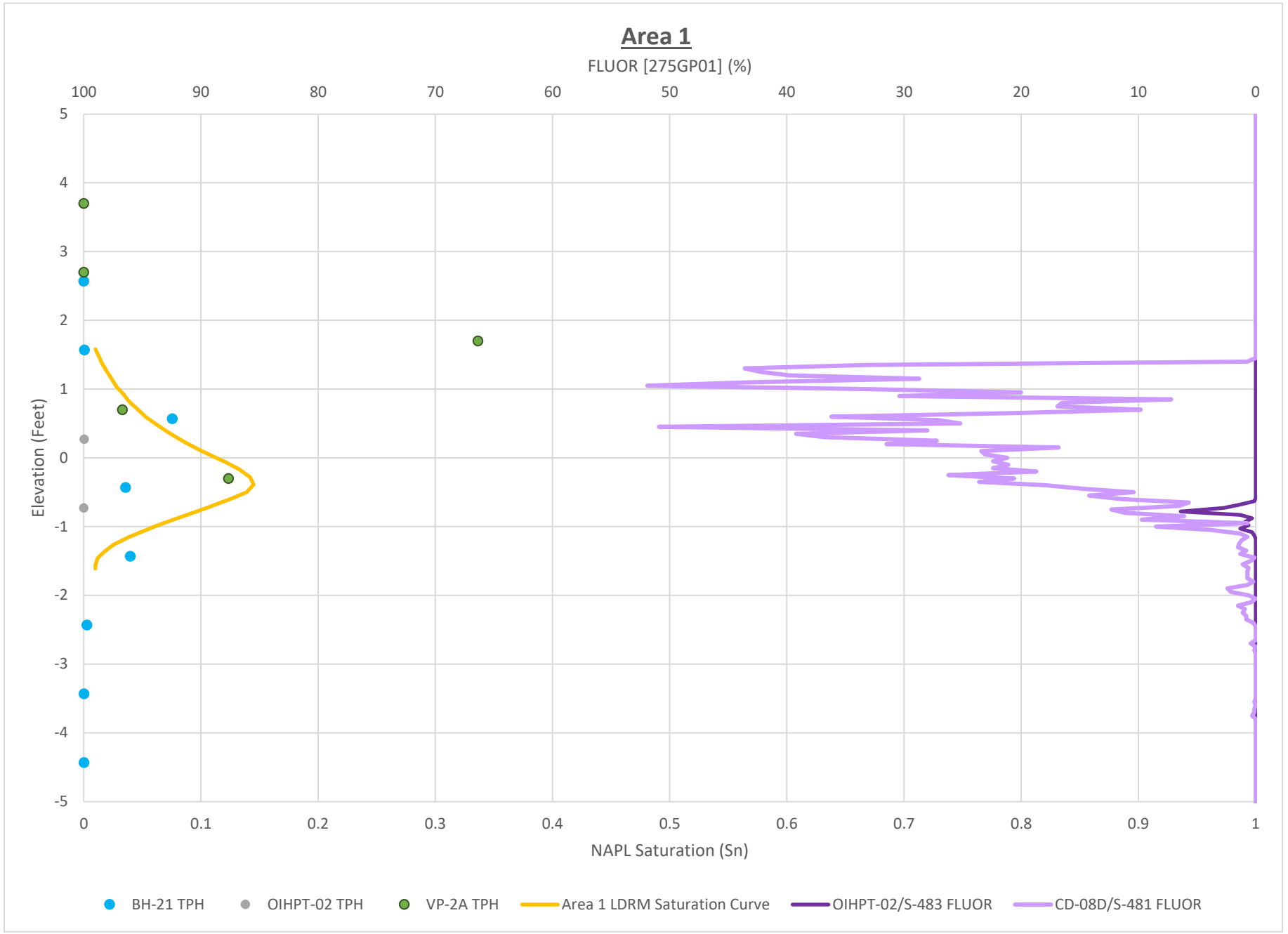
Project Location
City of Philadelphia,
Philadelphia County,
Pennsylvania

213403039
Prepared by ADK on 1/25/2022
Technical Review by JP on 1/26/2022
Independent Review by JLM on 1/26/2022

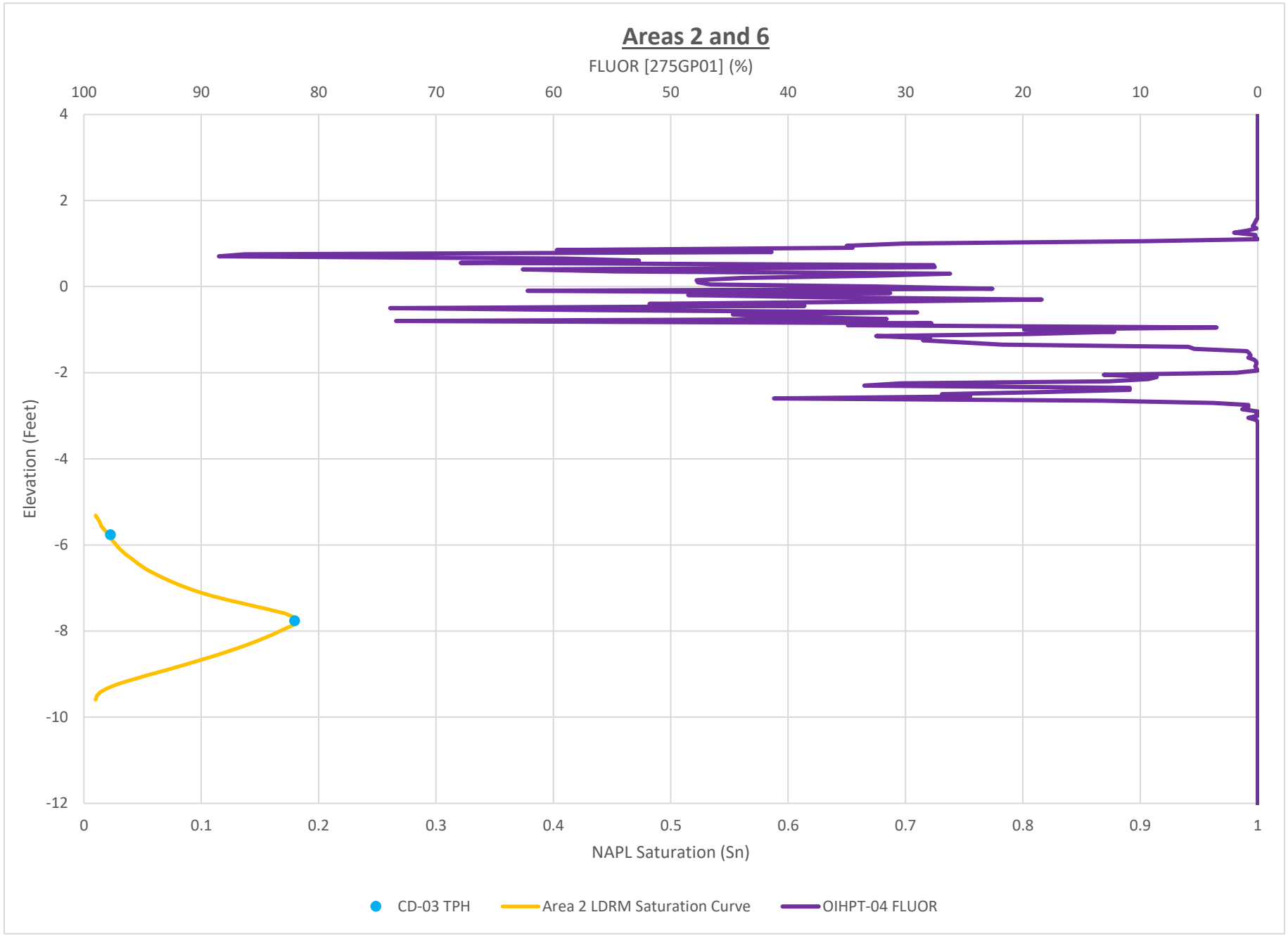
Client/Project
PHILADELPHIA ENERGY SOLUTIONS
REFINING & MARKETING LLC
FORMER PHILADELPHIA REFINING COMPLEX
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.
4

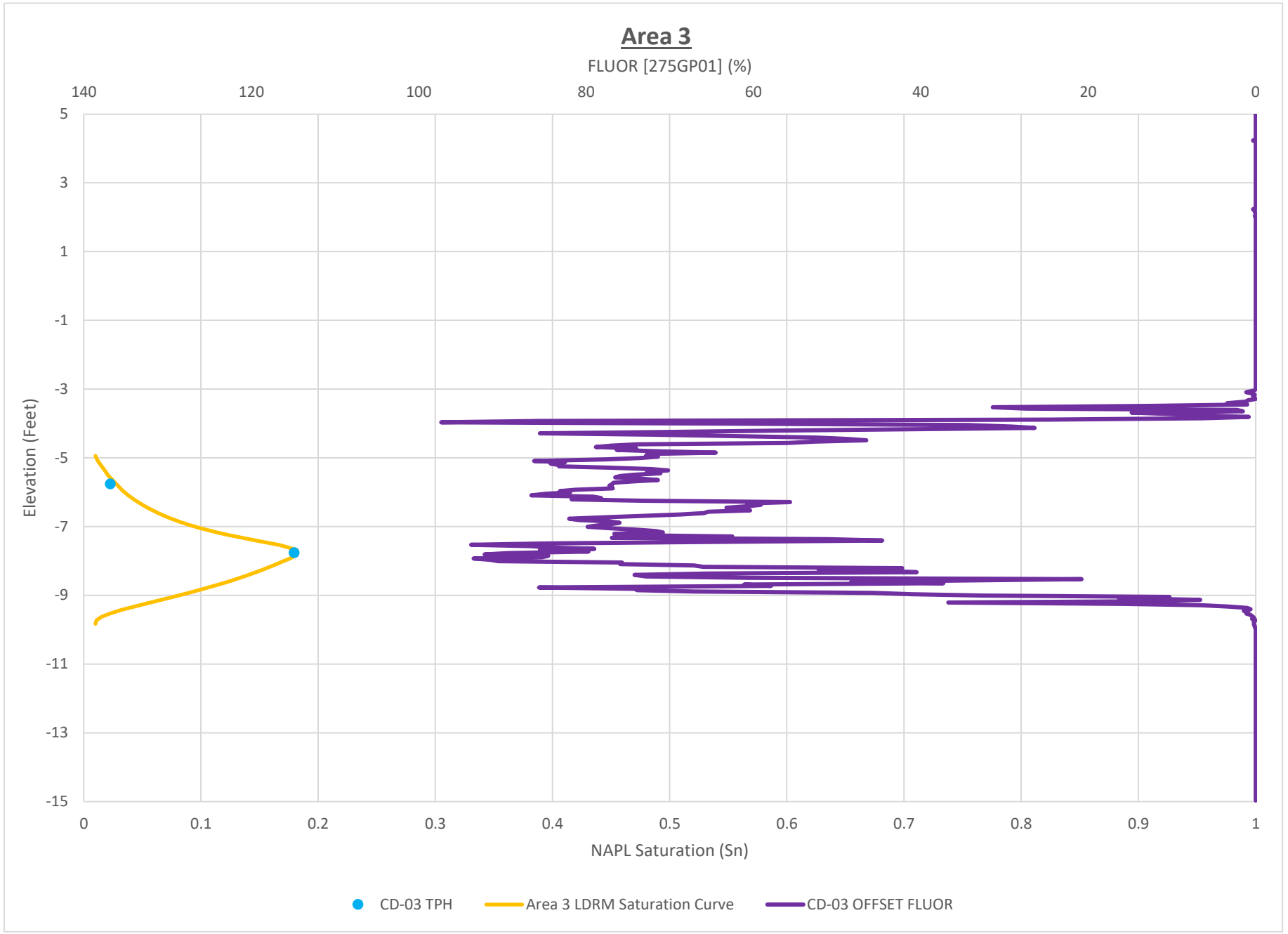
Title
PESRM UDEX RELEASE - UPDATED LNAPL RECOVERABLE VOLUME ESTIMATE


Area 1
FLUOR [275GP01] (%)
100
90
80
70
60
50
40
30
20
10
0
5
4
3
2
1
0
-1
-2
-3
-4
-5
Elevation (Feet)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
NAPL Saturation (Sn)
BH-21 TPH
OIHPT-02 TPH
VP-2A TPH
Area 1 LDRM Saturation Curve
OIHPT-02/S-483 FLUOR
CD-08D/S-481 FLUOR

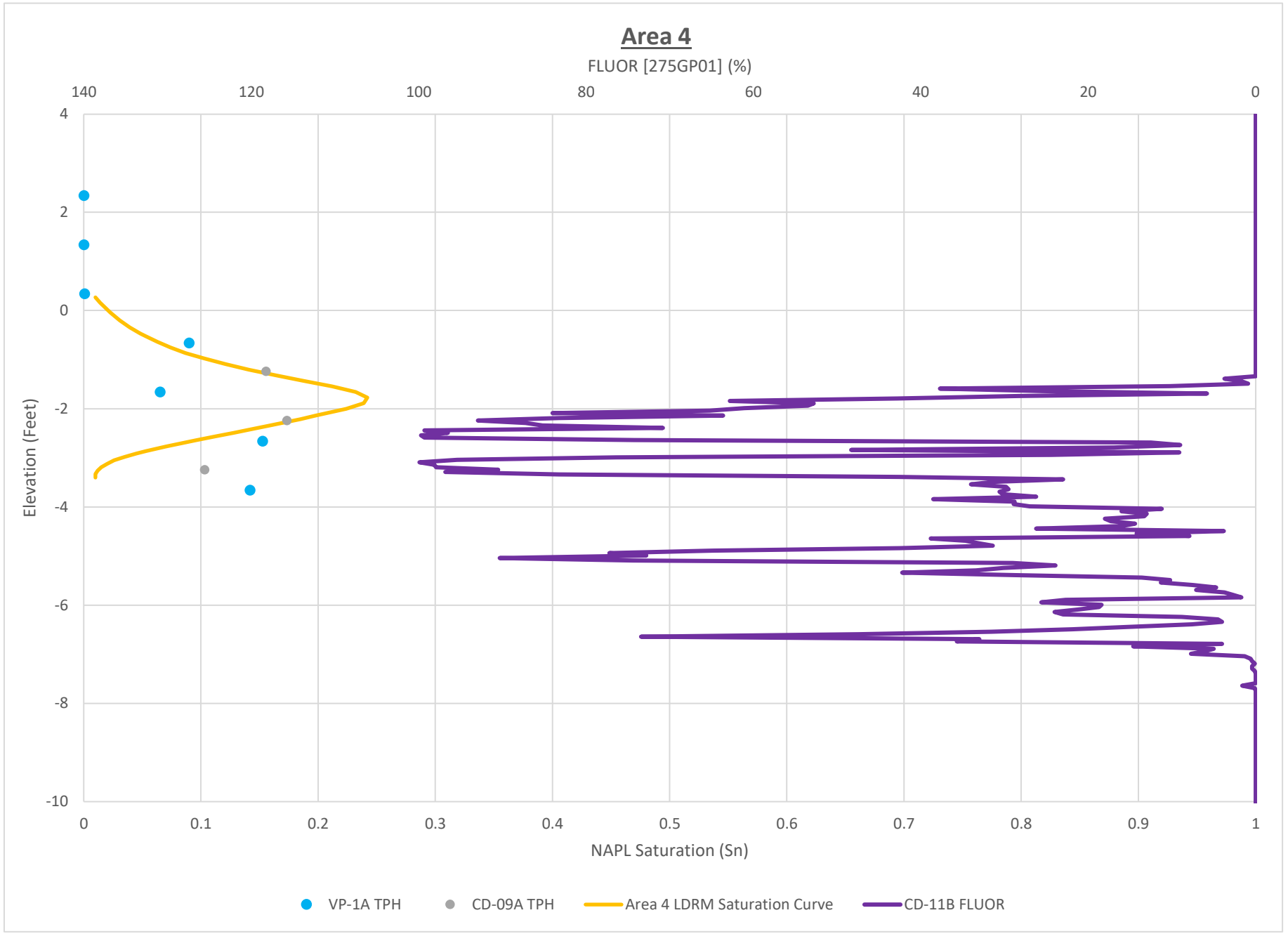
Stantec


Areas 2 and 6
FLUOR [275GP01] (%)
100
90
80
70
60
50
40
30
20
10
0
4
2
0
-2
-4
-6
-8
-10
-12
Elevation (Feet)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
NAPL Saturation (Sn)
CD-03 TPH
Area 2 LDRM Saturation Curve
OIHPT-04 FLUOR

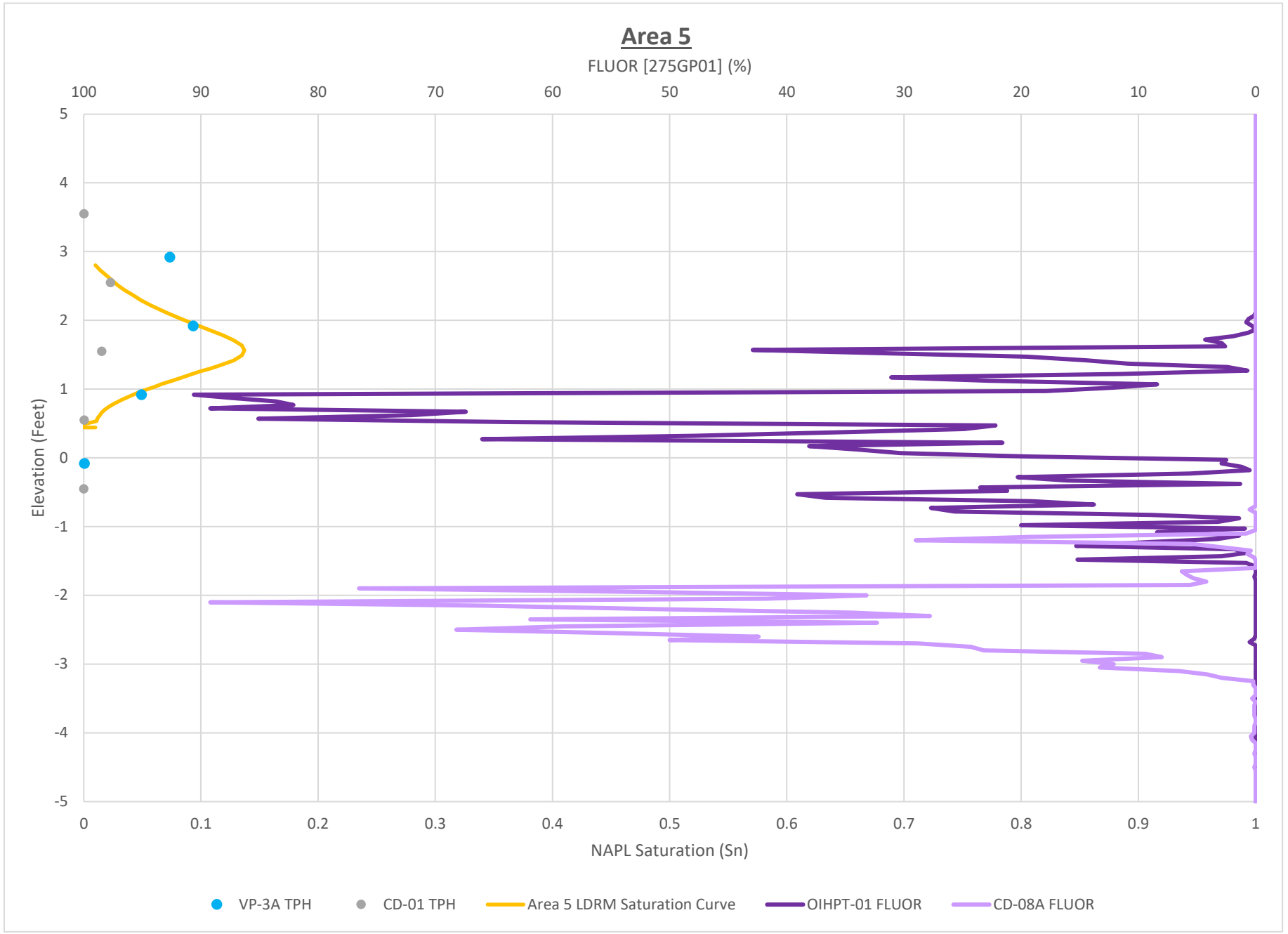
Stantec


Area 3
FLUOR [275GP01] (%)
140
120
100
80
60
40
20
0
5
3
1
-1
-3
-5
-7
-9
-11
-13
-15
Elevation (Feet)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
NAPL Saturation (Sn)
CD-03 TPH
Area 3 LDRM Saturation Curve
CD-03 OFFSET FLUOR

Stantec


Area 4
FLUOR [275GP01] (%)
140
120
100
80
60
40
20
0
4
2
0
-2
-4
-6
-8
-10
Elevation (Feet)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
NAPL Saturation (Sn)
VP-1A TPH
CD-09A TPH
Area 4 LDRM Saturation Curve
CD-11B FLUOR

Stantec


Area 5
FLUOR [275GP01] (%)
100
90
80
70
60
50
40
30
20
10
0
5
4
3
2
1
0
-1
-2
-3
-4
-5
Elevation (Feet)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
NAPL Saturation (Sn)
VP-3A TPH
CD-01 TPH
Area 5 LDRM Saturation Curve
OIHPT-01 FLUOR
CD-08A FLUOR

Stantec