

Preliminary Site Assessment Report

1680 NE Alsea Highway
Waldport, Oregon 97394
ECSI Site No. 1647

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PBS Project 24422.000



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1 INTRODUCTION

PBS Engineering and Environmental Inc. (PBS) completed a preliminary site assessment at 1680 NE Alsea Highway in Waldport, Oregon (Site). This report summarizes previous work performed at the Site and presents PBS' investigation results and conclusions.

1.1 Site Description and Topography

The Site is one 1.35-acre tax lot formerly occupied by the M.R. Wood Card Lock Facility. The Site is undeveloped and an easement for SE Meadowlark Lane is situated along the southern extent of the property.

The property is listed as Tax Lot 2700 in Section 20, Township 13 South, Range 11 West, of the Willamette Base and Meridian (Figure 1). The Site is bounded to the north and south by residential properties, to the west by NE Alsea Highway, and to the east by the Alsea River. The Site is currently unoccupied.

1.2 Site Ownership and History

Historically, the property was owned and operated by M.R. Wood Card Lock Facility as a fueling facility until several spills of petroleum occurred in the 1990s. The property was sold in 2005 to Timothy Schneider, the current owner, who wishes to develop the Site with residential buildings.

2 PREVIOUS ENVIRONMENTAL ISSUES AND ASSESSMENTS

PBS reviewed archived Department of Environmental Quality (DEQ) file records that provided the following information:

- In 1994, DEQ staff visited the site in response to a complaint referral from the State Fire Marshal's office. Gas and diesel surface contamination was observed; impacts to subsurface soil and groundwater were not evaluated. The site was assigned Environmental Cleanup Site Information (ECSI) file 1647.
- A substantial release of diesel product was discovered in 1995 during a complaint response by a DEQ inspector. The diesel release was determined to be caused by a leak in a diesel supply line at the dispenser. An unknown amount of diesel was released over an unknown period of time. The spill occurred at a tank storage area approximately 70 feet from Alsea Bay. The diesel product migrated to a wetland/drainage ditch situated along the northern extent of the property and was discharged to Alsea Bay. Cleanup of the spill was handled by the DEQ spill program.
- Following the release, two underground storage tanks (USTs) were located and decommissioned by removal by Goff Construction. Several remedial excavations and investigations were completed, including the installation of four monitoring wells (MW-1 through MW-4). Petroleum-contaminated soil (PCS) generated from the remedial excavations appears to have been treated on site; however, the disposition of the PCS is unknown, and it appears that analytical testing had shown further treatment was necessary. Additionally, MW-1 through MW-3 were unable to be located following their installation.
- The most recent investigation was performed by Statewide Environmental Services, Inc. (Statewide) of Newport, Oregon, who completed a subsurface site investigation in 2008. Fifteen borings were completed at the site, which identified diesel-range total petroleum hydrocarbon (TPH) concentrations in soil ranging from 108 milligrams per kilogram (mg/kg) to 12,100 mg/kg. Heavy oil-range TPH was detected in soil at concentrations ranging from 79.2 mg/kg to 1,580 mg/kg. Three groundwater samples appear to have been collected during the investigation, with a maximum diesel-range TPH detection of 64,700 micrograms per liter ($\mu\text{g/L}$), a maximum heavy oil-range TPH of 500

µg/L, and a maximum gasoline-range TPH of 1,900 µg/L. Data tables from the investigation are included as an attachment to this work plan.

Based on these findings, PBS recommended further delineation of the magnitude and extent of soil and groundwater contamination and development of a conceptual site model (CSM) to evaluate risk.

3 REGIONAL GEOLOGY AND HYDROGEOLOGY

The Site lies within the mouth of the Alsea River along the Pacific Coast of Oregon. Silty surface soil is underlain by basaltic lava flows with beds of pure tuff and tuffaceous shales present at a greater depth.¹ Based on nearby monitoring well logs, the shallowest occurrence of groundwater is expected to be between 10 and 15 feet below ground surface (bgs). Given the proximity of the Pacific Ocean, shallow groundwater is assumed to be brackish. Based on topography, the direction of shallow, unconfined groundwater flow is expected to be toward the northeast toward the Alsea River.

4 PURPOSE AND SCOPE

The purpose of the investigation was to evaluate the progress of natural attenuation for the known petroleum impacts related to the historic spills and releases at the Site. The initial scope of work was designed to evaluate current conditions and to delineate areas of contamination to ultimately support a No Further Action (NFA) determination from DEQ. The scope of work included a test pit investigation and sampling onsite groundwater monitoring wells, which was described in a work plan submitted to DEQ². The work plan was approved by DEQ on May 5, 2023 with the following modifications:

- Two additional test pits would be completed to the south, for delineation purposes.
- The southwestern-most test pit location would be located between Statewide's borings B11 and B12.
- The northeastern-most test pit would be located at B6.
- All soil samples would additionally be analyzed for Benzene, toluene, ethylbenzene, xylenes (BTEX) plus naphthalene by Environmental Protection Agency (EPA) Method 8260

5 FIELD ACTIVITIES

5.1 Monitoring Well Locate and Sampling

Prior to beginning the investigation, a site-specific health and safety plan (HASP) was prepared and reviewed with all field personnel and subcontractors before beginning work.

PBS attempted to locate the wells using a Schonstedt metal detector. MW-1 was located within the western extent of the property near the southern edge of SE Meadowlark Lane. MW-4 was found approximately 50 feet northeast of MW-1, near the northern edge of SE Meadowlark Lane. The locations of MW-1 and MW-4 are shown in Figure 2. PBS was unable to locate MW-2 or MW-3.

Monitoring wells MW-1 and MW-4 were purged and sampled according to the DEQ-approved work plan by using a peristaltic pump and new disposable polyethylene tubing. A water quality meter was used to record temperature, specific conductivity, dissolved oxygen (DO), pH, and oxidation reduction potential (ORP) during low-flow purging and sampling. In addition, visual turbidity observations were recorded, and a turbidity reading was taken prior to sample collection.

¹ United States Geological Survey. (1949). *Geology of the Newport-Waldport Area, Lincoln and Lane Counties, Oregon*.

² PBS. (2023). *Site Assessment Work Plan*.

PBS personnel wore new disposable nitrile gloves while collecting each sample. Groundwater samples were placed into laboratory-provided containers. The samples were delivered to Apex Laboratories of Tigard, Oregon, under chain-of-custody (COC) documentation and analyzed for the following:

- Diesel-and oil-range TPH by Northwest Method Total Petroleum Hydrocarbons, diesel extended (NWTPH-Dx)
- Gasoline-range TPH by NWTPH, gasoline extended (NWTPH-Gx)
- BTEX plus naphthalene by Environmental Protection Agency (EPA) Method 8260

Based on initial test results, the groundwater sample from MW-4 was additionally analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270 SIM. Copies of the laboratory results are included in Appendix B.

5.2 Test Pit Investigation

PBS was on site from May 8 and May 9, 2023, to conduct the test pit investigation, with Great Western Corporation (GWC) of North Bend, Oregon, providing excavation services. A track hoe with an 11-foot excavation capability was used to complete all test pits. Photo documentation of field activities is provided in Appendix C.

In each test pit, soil was segregated based on depth (0 to 3 feet bgs, and deeper than 3 feet) and logged, noting grain size, color, odor, and moisture. All soil samples were collected in accordance with the DEQ-approved work plan. Photoionization detector (PID) measurements from excavation spoils were taken continuously to assess the presence of volatile compounds. Soil for analysis was collected from the interior of the excavator bucket, and not from soil exposed at the top or that had been in contact with the bucket sides. Soil was field preserved for VOCs using EPA Method 5035.

Tests pits were completed at the following locations:

- TP-1, TP-2, and TP-3 were completed as “source area test pits” in areas of the suspected highest remaining contamination. TP-2 was completed at the approximate former location of the pump island. TP-3 was completed near the approximate location of the former ASTs. TP-1 was completed near the center of the property, roughly in line with TP-2 and TP-3, where elevated concentrations of TPH had been detected in previous assessments.
- TP-4, TP-5, and TP-6 were completed as northern and eastern delineation test pits.
- TP-7 was completed as a southern delineation test pit around the former contaminated soil holding area, south of TP-3.
- TP-8 was completed as a southern delineation test pit, approximately 60 feet west of TP-7.
- TP-9 and TP-10 were completed south of TP-2, to delineate contamination south of the former aboveground storage tank (AST) area.
- TP-11 was completed to the west of TP-2, approximately 75 feet from Alsea Highway.

Groundwater was only encountered in test pits TP-1, TP-2, and TP-6 at volumes sufficient for sample collection. Groundwater was observed entering test pits TP-9 and TP-10; however, time constraints prevented groundwater sample collection.

At each test pit from which a sample was collected, groundwater was purged using a peristaltic pump and new disposable tubing prior to the collection of groundwater samples. Lithology and results of field screening activities are documented on test pit logs provided in Appendix D.

All samples were collected in laboratory-supplied containers, placed on ice in a cooler, and transported with chain-of-custody documentation to Apex Laboratories.

The excavator bucket and other sampling equipment were decontaminated between test pits using a detergent wash and tap water rinse. PBS personnel wore new disposable nitrile gloves when collecting samples. Upon completion of sampling, excavation spoils were placed back into the test pits and compacted with the excavator bucket to match the surrounding grade.

5.3 Soil Sampling

Soil samples were collected from each test pit at intervals indicating the highest levels of contamination based on field evidence, including PID detections, odor, staining, or sheen and from the soil/water interface depth. In the absence of groundwater or observed contamination, soil samples were generally collected near the bottom of the test pit. When possible, a vertical delineation sample was collected from test pits where field evidence suggested contamination had dissipated. Soil samples were analyzed for the following:

- NWTPH-Dx
- NWTPH-Gx
- EPA Method 8260 BTEX + Naphthalene

Based on these initial results, soil samples were subject to follow-up analysis for the following:

- Petroleum-related VOCs by EPA Method 8260
- PAHs by EPA Method 8270 SIM

5.4 Groundwater Sampling

Groundwater samples collected from test pits and monitoring wells were analyzed for the following:

- NWTPH-Dx
- NWTPH-Gx
- BTEX + Naphthalene by EPA Method 8260

Based on the initial results, groundwater samples collected from TP-2 and TP-6 were subject to follow-up analysis of one or both of the following:

- Petroleum-related VOCs by EPA Method 8260
- PAHs by EPA Method 8270 SIM

6 FINDINGS

6.1 Soil and Groundwater Field Observations

All test pits were excavated to approximately 11 feet bgs (the maximum reach of the excavator). Generally, the subsurface consisted of sandy silt with gravel and cobbles, except for the eastern and southern-most test pits where gravel and cobbles were not encountered, and silty sand was prevalent. Lean clay was encountered at approximately 10 feet bgs in test pits TP-1 and TP-3.

Groundwater only accumulated enough volume to allow for sample collection in test pits TP-1, TP-2, and TP-6. Wet soil indicative of the soil/water interface was also encountered in TP-4; however, groundwater did not

accumulate in the test pit to allow for sampling. Test pits TP-9 and TP-11 additionally encountered wet soils; however, time constraints prohibited sampling. Eastern and southern test pits, where different soil lithology was observed, had soil with notably less moisture and no accumulation of groundwater. Test pit logs are provided in Appendix D.

Field evidence of contamination was observed in excavation spoils recovered from test pits TP-1 through TP-4, TP-6, and TP-9, where staining and petroleum odor were noted. PBS staff did not observe a petroleum odor or sheen on groundwater collected from MW-1, MW-4, or TP-1, but an obvious sheen and petroleum odor were detected on groundwater recovered from test pits TP-2 and TP-6. Excavation spoils from the test pits mostly exhibited PID readings between 0.5 parts per million (ppm) to 39.9 ppm, except for soil recovered from TP-2, which had a maximum detection of 200.1 ppm.

6.2 Soil Analytical Results

Soil sample analytical results are summarized in Table 1. Laboratory reports are provided in Appendix B. The following is a summary of the results:

- Contaminants of concern were not detected above laboratory reporting limits in soil samples collected from test pits TP-5, TP-7, TP-8, TP-10, and TP-11.
- Diesel-range hydrocarbons were detected in test pits TP-1 through TP-3, TP-6, and TP-9 at concentrations ranging from 63.7 mg/kg to 11,100 mg/kg.
- Heavy oil-range hydrocarbons were detected in test pits TP-1 (1,250 mg/kg) and TP-4 (316 mg/kg).
- Gasoline-range hydrocarbons were detected in test pits TP-1 through TP-3, TP-6, and TP-9 at concentrations ranging from 23.5 mg/kg to 1,690 mg/kg.
- Several VOCs including benzene (1.22 mg/kg), ethylbenzene (0.763 mg/kg), and naphthalene (19 mg/kg) were detected in test pit TP-2. Naphthalene was also detected in TP-6 at a concentration of 1.84 mg/kg, and xylenes were detected at a concentration of 0.153 mg/kg in test pit TP-3.
- Various PAHs were detected in test pits TP-1, TP-2, TP-3, and TP-6.

6.3 Groundwater Analytical Results

Groundwater analytical results are summarized in Table 2. Laboratory reports are provided in Appendix B. The results are summarized as follows:

- There were no detections above laboratory reporting limits in monitoring well MW-1.
- Heavy oil-range hydrocarbons were not detected in any of the groundwater samples above laboratory reporting limits.
- Diesel-range hydrocarbons were detected in groundwater samples collected from TP-1, TP-2, TP-6, and MW-4 at concentrations ranging from 213 µg/L to 32,900 µg/L.
- Gasoline-range hydrocarbons were detected in groundwater samples collected from TP-2 (2,790 µg/L) and TP-6 (1,830 µg/L).
- Several VOCs including benzene, ethylbenzene, and naphthalene were detected in groundwater samples collected from test pits TP-2 and TP-6.
- Several PAHs were detected in groundwater samples collected from MW-4, TP-2, and TP-6.

6.4 Trip Blank

There were no detections of VOCs in the trip blank from the investigation.

6.5 Deviations from Work Plan

A duplicate groundwater sample was not collected from the monitoring wells as MW-2 and MW-3 could not be located after samples had already been collected from MW-1 and MW-4.

7 RISK-BASED EVALUATION

A CSM describes the known or suspected source of contamination, considers how the contaminants are likely to migrate (pathways), and identifies who is likely to be affected by the contaminants (receptors). For risk to be present at the Site, a source must be present, pathways must be complete, and receptors must be present. Analytical results were screened against DEQ's risk-based concentrations (RBCs) to evaluate potential risk.³ The following sections describe the potentially complete exposure pathways and risk screening.

7.1 Source of Release

Multiple releases caused by documented spills and removed USTs are the source of the release.

7.2 Contaminants of Concern

Contaminants of concern for soil and groundwater include the following:

- Soil:
 - Gasoline-range hydrocarbons
 - Diesel- and heavy oil-range hydrocarbons
 - Petroleum-related VOCs (Benzene, 1,2-dichloroethane, ethylbenzene, isopropylbenzene, naphthalene, n-propylbenzene, toluene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and total xylenes)
 - PAHs
- Groundwater:
 - Gasoline-range hydrocarbons
 - Diesel-range hydrocarbons
 - Petroleum-related VOCs (Benzene, ethylbenzene, isopropylbenzene, n-propylbenzene, toluene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and total xylenes)
 - PAHs

7.3 Facility and Locality of the Facility

The facility is defined by the DEQ as an area in which hazardous substances or materials may have been deposited, stored, placed, or otherwise have come to be located, and a release has occurred or there is threat of a release. Given the extensive spills and releases known to have occurred at the property and its former use as a bulk fueling facility, the facility is designated as the Site's northern, eastern and southern boundaries to MW-1 and TP-11 the southwestern extent of the Site.

The locality of the facility (LOF) is defined by Oregon DEQ as the area where human or ecological receptors are reasonably likely to encounter facility-related hazardous substances. The area is determined by considering factors such as the physical and chemical characteristics of the contaminants, the physical

³ DEQ (Department of Environmental Quality). (September 22, 2003. Updated May 2018). *Risk-Based Decision Making for the Remediation of Contaminated Sites*.

characteristics that govern the migration of contaminants (i.e., soil characteristics and groundwater gradient), and human activities in the vicinity. The LOF typically defines the maximum migration extent for each medium, considering all these factors. Additional assessment is necessary to accurately define the LOF.

7.4 Current and Likely Future Uses of Land and Groundwater

The property is currently vacant and undeveloped. The site is zoned R-2 (residential). The Client plans to develop the property with residential housing.

The Oregon Water Resources Department well query online database provides logs for water wells.⁴ This database was reviewed by PBS on June 1, 2023, for water well logs located within 0.25 mile for Township 13S, Range 11W, Section 20. Geotechnical boreholes and abandoned wells were not considered beneficial uses for this review.

PBS did not identify any wells located within the 0.25 mile radius of the Site. A printout of the vicinity well search for Township 13S, Range 11W, Section 20 is included in Appendix E. Based on this information, groundwater does not appear to be in use at or near the site, and municipal water is readily available. Future well installation for potable use is unlikely given the proximity of the Site to the ocean.

7.5 Current and Future Receptors

As the Site is vacant, current receptors include visitors to the property. Future receptors include residents, and construction and excavation workers.

7.6 Potentially Complete Soil Exposure Pathways

The following soil pathways are potentially complete:

- Soil ingestion, dermal contact, and inhalation for residential, construction, and excavation worker receptors
- Volatilization to outdoor air for residential receptors
- Vapor intrusion into buildings for residential receptors

The leaching to groundwater pathway is not complete based on the limited beneficial water use determination above, and because groundwater is not and will not be used at the Site.

7.7 Potentially Complete Groundwater Exposure Pathways

The groundwater pathways are potentially complete:

- Volatilization to outdoor air for residential receptors
- Vapor intrusion into buildings for residential receptors
- Groundwater in excavation for construction and excavation worker receptors

The ingestion and inhalation from tap water pathway is not considered complete based on the current and future use of groundwater noted above.

7.8 Risk Analysis

RBCs for the potentially complete exposure pathways are provided in Tables 1 and 2.

⁴ http://apps.wrd.state.or.us/apps/gw/well_log/

7.8.1 Soil

Analytical results were compared to DEQ RBCs for residential receptors, as well as construction and excavation workers for the soil ingestion, direct contact, and inhalation RBC. Diesel, gasoline, and heavy oil-range TPH concentrations in soil samples collected exceed applicable direct contact exposure DEQ RBCs for residential receptors. Diesel-range TPH detected in test pit TP-2 additionally exceeded the direct contact RBC protective of construction workers. A naphthalene detection in a soil sample collected from TP-2 additionally exceeded the direct contact pathway for residential receptors.

Benzene and naphthalene concentrations in soil samples collected from TP-2 exceed the Vapor Intrusion into Buildings RBC for residential RBCs. Naphthalene also exceeded the Volatilization to Outdoor Air RBC for residential RBCs.

7.8.2 Groundwater

Diesel concentrations in a groundwater sample collected from TP-2 were noted to exceed the solubility limit (typically 6,800 µg/L) that is used for The Groundwater in Excavation RBC, Vapor Intrusion into Buildings RBC, and Volatilization to Outdoor Air RBC.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

PBS completed an investigation to evaluate Site conditions related to the historic releases and spills associated with ECSI file number 1647. Petroleum contamination in soil including gasoline-, diesel-, and heavy oil-range hydrocarbons were detected in test pits excavated within the central and northern extents of the property (test pits TP-1, TP-2, TP-3, TP-4, TP-6, and TP-9). Limited groundwater sampling completed during the investigation indicates that groundwater remains impacted by the former releases.

Concentrations of petroleum contamination in soil and groundwater were notably higher in TP-2 than elsewhere on the property. TP-2 was completed within the western extent of the property around the former pump island. Future home construction would be planned at least 100 feet east of TP-2.

The Inhalation and Ingestion from Tapwater and Leaching to Groundwater pathways are not complete based on the limited beneficial water use (public drinking water is utilized). Insufficient data is currently available to determine if unacceptable risk to human health is present at the site. Contaminated soil was not encountered shallower than 3 feet bgs in any of the test pits excavated, making the direct contact pathway incomplete. Additionally, a Contaminated Media Management Plan (CMMP) and site-specific HASP should be prepared to mitigate risk to future workers at the Site. The Vapor Intrusion into Buildings pathway requires additional evaluation to determine if the pathway is complete.

8.2 Recommendations

Additional soil and groundwater delineation is required to characterize the magnitude and extent of the release. An investigation should be completed to collect deeper soil samples for characterizing the vertical extent of petroleum contamination within the areas of TP-2, TP-3, and TP-6. Additional lateral delineation of petroleum contamination is necessary to the north and west of TP-6. Groundwater samples should be collected to delineate groundwater impacts to the east, north, and south.

Soil gas samples should be collected to evaluate potential vapor intrusion risk for future occupants of the Site as well as the southern-adjacent residence. As well, a Tier 1 Ecological Risk Assessment should be performed to assess potential risk to the adjacent wetland area and Alsea River.

Figures

Figure 1. Site Vicinity

Figure 2. Soil TPH & BTEX+N Results

Figure 3. Groundwater TPH & BTEX+N Results



Site Vicinity

1680 Alsea Highway, Waldport, Oregon

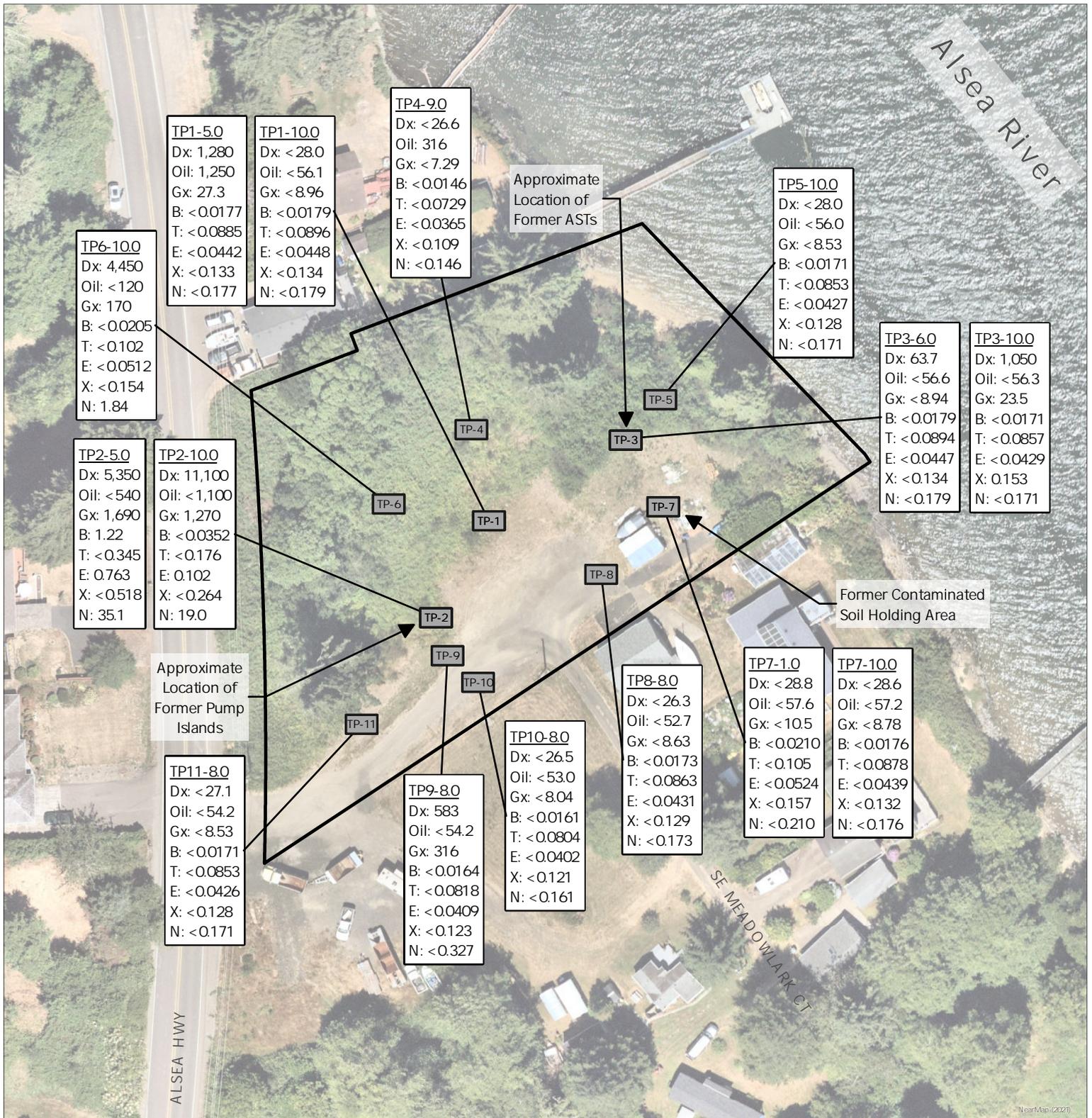
Date: June 2023 | Project: 24422.000

Figure: 1

● Site Location



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Soil TPH & BTEX+N Results

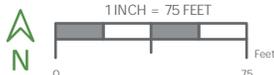
1680 Aalsea Highway, Waldport, Oregon

Date: June 2023 | Project: 24422.000

Figure: 2

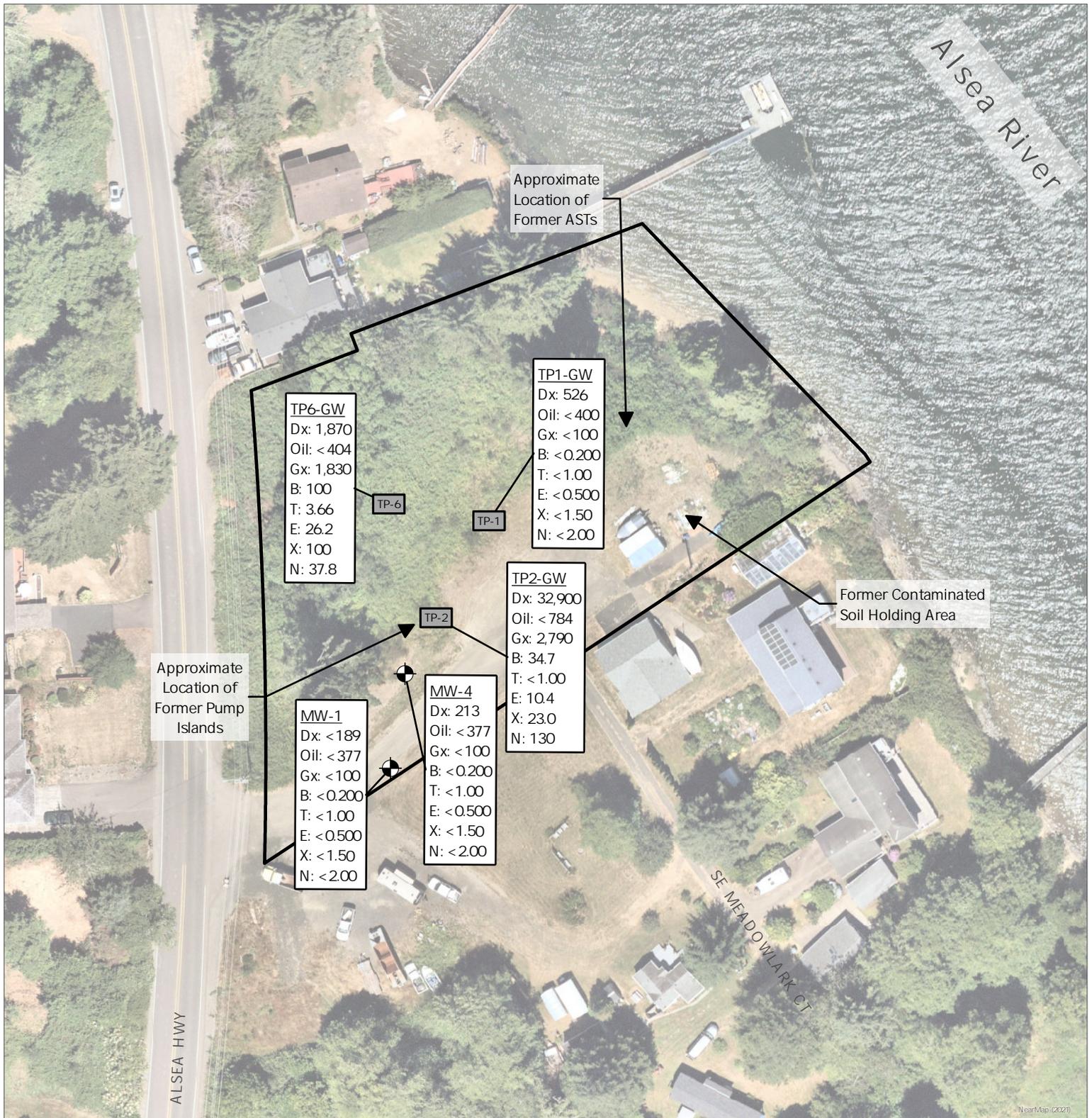
- Test Pit
- Site Boundary

Dx: Diesel Range Hydrocarbons
 Oil: Heavy Oil Range Hydrocarbons
 Gx: Gasoline Range Hydrocarbons
 B: Benzene
 T: Toluene
 E: Ethylbenzene
 X: Xylenes
 N: Naphthalene



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All measurements in mg/kg.



Groundwater TPH & BTEX+N

1680 Alsea Highway, Waldport, Oregon

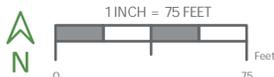
Date: June 2023 | Project: 24422.000

Figure: 3

-  Monitoring Well
-  Test Pit
-  Site Boundary

All measurements in µg/L.

Dx: Diesel Range Hydrocarbons
 Oil: Heavy Oil Range Hydrocarbons
 Gx: Gasoline Range Hydrocarbons
 B: Benzene
 T: Toluene
 E: Ethylbenzene
 X: Xylenes
 N: Naphthalene



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Tables

- Table 1. Summary of Soil Sample Analytical Results
- Table 2. Summary of Groundwater Analytical Results

Table 1. Summary of Soil Analytical Results
1680 NE Alsea Highway
Waldport, Oregon
ECSI Site No. 1647

Sample ID	Sample Date	Matrix	Depth Collected (feet bgs)	Total Petroleum Hydrocarbons			Volatile Organic Compounds						Polycyclic Aromatic Hydrocarbons										
				Gasoline	Diesel	Heavy Oil	Benzene	Toluene	Isopropylbenzene	Ethylbenzene	Total Xylenes	1,2,4-Trimethylbenzene	Naphthalene	Benzo(g,h,i)perylene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Phenanthrene	Pyrene	Dibenzofuran
mg/kg																							
TP1-5.0	5/8/2023	Soil	5.0	27.3	1,280	1,250	<0.0177	<0.0885	--	<0.0442	<0.133	--	<0.177	0.0509	<0.0410	<0.0410	0.0437	0.0543	0.0913	0.0491	0.068	<0.0410	<0.0410
TP1-10.0	5/8/2023	Soil	10.0	<8.96	<28.0	<56.1	<0.0179	<0.0896	--	<0.0448	<0.134	--	<0.179	--	--	--	--	--	--	--	--	--	--
TP2-5.0	5/8/2023	Soil	5.0	1,690	5,350	<540	1.22	<0.345	4.84	0.763	<0.518	6.65	35.1	--	--	--	--	--	--	--	--	--	--
TP2-10.0	5/8/2023	Soil	10.0	1,270	11,100	<1,100	<0.0352	<0.176	--	0.102	<0.264	--	19.0	<0.200	0.222	8.61	<0.200	29.7	40.5	12.7	13.4	0.651	4.16
TP3-6.0	5/8/2023	Soil	6.0	<8.94	63.7	<56.6	<0.0179	<0.0894	--	<0.0447	<0.134	--	<0.179	--	--	--	--	--	--	--	--	--	--
TP3-10.0	5/8/2023	Soil	10.0	23.5	1,050	<56.3	<0.0171	<0.0857	--	<0.0429	0.153	--	<0.171	<0.0139	0.0243	0.195	<0.0139	0.263	0.0168	0.0210	0.480	0.0504	0.0904
TP4-9.0	5/8/2023	Soil	9.0	<7.29	<26.6	316	<0.0146	<0.0729	--	<0.0365	<0.109	--	<0.146	--	--	--	--	--	--	--	--	--	--
TP5-10.0	5/9/2023	Soil	10.0	<8.53	<28.0	<56.0	<0.0171	<0.0853	--	<0.0427	<0.128	--	<0.171	--	--	--	--	--	--	--	--	--	--
TP6-10.0	5/9/2023	Soil	10.0	170	4,450	<120	<0.0205	<0.102	--	<0.0512	<0.154	--	1.84	<0.0757	<0.0757	1.32	<0.0757	5.24	7.14	1.38	0.995	0.100	0.468
TP7-1.0	5/9/2023	Soil	1.0	<10.5	<28.8	<57.6	<0.0210	<0.105	--	<0.0524	<0.157	--	<0.210	--	--	--	--	--	--	--	--	--	--
TP7-10.0	5/9/2023	Soil	10.0	<8.78	<28.6	<57.2	<0.0176	<0.0878	--	<0.0439	<0.132	--	<0.176	--	--	--	--	--	--	--	--	--	--
TP8-8.0	5/9/2023	Soil	8.0	<8.63	<26.3	<52.7	<0.0173	<0.0863	--	<0.0431	<0.129	--	<0.173	--	--	--	--	--	--	--	--	--	--
TP9-8.0	5/9/2023	Soil	8.0	316	583	<54.2	<0.0164	<0.0818	--	<0.0409	<0.123	--	<0.327	--	--	--	--	--	--	--	--	--	--
TP10-8.0	5/9/2023	Soil	8.0	<8.04	<26.5	<53.0	<0.0161	<0.0804	--	<0.0402	<0.121	--	<0.161	--	--	--	--	--	--	--	--	--	--
TP11-8.0	5/9/2023	Soil	8.0	<8.53	<27.1	<54.2	<0.0171	<0.0853	--	<0.0426	<0.128	--	<0.171	--	--	--	--	--	--	--	--	--	--
Oregon DEQ RBC ¹ - Ingestion, Dermal Contact, & Inhalation	Residential			1,200	1,100		8.2	5,800	3,500	34	1,400	430	5.3	NS	2,400	3,100	1.1	NS	NS	5.3	NS	1,800	NS
	Construction Worker			9,700	4,600		380	28,000	27,000	1,700	20,000	2,900	580	NS	10,000	14,000	170	NS	NS	580	NS	7,500	NS
	Excavation Worker			>MAX	>MAX		11,000	770,000	750,000	49,000	560,000	81,000	16,000	NS	280,000	390,000	4,900	NS	NS	16,000	NS	210,000	NS
Oregon DEQ RBC ¹ - Volatilization to Outdoor Air	Residential			5,900	>MAX		11.0	>Csat	>Csat	36	>Csat	>Csat	6.4	NS	NV	>Max	NV	NS	NS	6.4	NS	>Max	NS
Oregon DEQ RBC ¹ - Vapor Intrusion into Buildings	Residential			94	>MAX		0.16	>Csat	>Csat	1.3	160	140	6.4	NS	NV	>Max	NV	NS	NS	6.4	NS	>Max	NS
Oregon DEQ RBC ¹ - Leaching to Groundwater	Residential			31	9,500		0.023	84	96	0.22	23	10	0.077	NS	>Csat	>Csat	>Csat	NS	NS	0.077	NS	>Csat	NS
Oregon Clean Fill Values ²				31	1,100		0.023	23	96	0.22	1.4	10	0.077	25	10	3.7	1.1	0.36	11	0.077	5.5	10	0.002

Notes:

See laboratory report for full list of analytes.

bgs: below ground surface

mg/kg: milligrams per kilogram

NS: RBC value not set for this analyte

--: analyte not tested

<: not detected above the laboratory reporting limit

>Csat: This soil RBC exceeds the limit of three-phase equilibrium partitioning.

Bold text, if present, indicates an exceedance of one or more of the cleanup levels. Values less than the regional background concentrations for metals or less than clean fill values are not bolded. In instances where a concentration exceeds clean fill criteria

and a RBC value, the respective cleanup value is also bolded.

¹: Leaching to groundwater RBCs are not provided for inorganic chemicals. If this pathway is of concern, then site-specific leaching tests must be performed.

²Oregon Risk-Based Decision-Making for the Remediation of Petroleum-Contaminated Sites, Oregon DEQ Sept. 2003, Revised RBCs May 2018.

³Oregon Department of Environmental Quality (DEQ) Clean Fill Determinations Internal Management Directive, February 21, 2019.

NV: this chemical is considered nonvolatile for purposes of the exposure calculations

> MAX: The constituent RBC for this pathway is calculated as greater than 1,000,000 mg/kg or 1,000,000 mg/L. Therefore, this substance is deemed not to pose risks in this scenario.

Table 2. Summary of Groundwater Analytical Results
1680 NE Alsea Highway
Waldport, Oregon
ECSI Site No. 1647

Sample ID	Sample Date	Location	Total Petroleum Hydrocarbons			Volatile Organic Compounds							Polycyclic Aromatic Hydrocarbons									
			Gasoline	Diesel	Heavy Oil	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	Isopropylbenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Benzo(b)fluoranthene	Fluorene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Phenanthrene	Pyrene	Carbazole	Dibenzofuran
			µg/L																			
MW-1	5/8/2023	MW-1	<100	<189	<377	<0.200	<1.00	<0.500	<1.50	<2.00	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	5/8/2023	MW-4	<100	213	<377	<0.200	<1.00	<0.500	<1.50	<2.00	--	--	--	0.0168	0.139	<0.0641	<0.0641	0.108	<0.0641	<0.0321	0.0593	0.101
TP1-GW	5/9/2023	TP-1	<100	526	<400	<0.200	<1.00	<0.500	<1.50	<2.00	--	--	--	--	--	--	--	--	--	--	--	--
TP2-GW	5/9/2023	TP-2	2,790	32,900	<784	34.7	<1.00	10.4	23.0	130	11.2	21.5	3.97	<0.352	7.57	62.3	75.2	92.7	7.84	<0.704	3.42	5.42
TP6-GW	5/9/2023	TP-6	1,830	1,870	<404	100	3.66	26.2	100	37.8	7.55	18.5	6.41	<0.0728	4.94	41.0	58.7	29.3	2.53	0.186	0.895	2.08
Oregon DEQ RBC ¹ - Ingestion & Inhalation from Tapwater		Residential	110	100		0.46	1,100	1.5	190	0.17	440	54	59	0.25	280	NS	NS	0.17	NS	110	NS	NS
Oregon DEQ RBC ¹ - Volatilization to Outdoor Air		Residential	>S	>S		3,100	>S	9,900	>S	3,600	>S	>S	>S	NV	>S	NS	NS	3,600	NS	>S	NS	NS
Oregon DEQ RBC ¹ - Vapor Intrusion into Buildings		Residential	22,000	>S		210	>S	620	86,000	840	>S	50,000	36,000	NV	>S	NS	NS	840	NS	>S	NS	NS
Oregon DEQ RBC ¹ - Groundwater in Extraction		Construction & Excavation Worker	14,000	>S		1,800	220,000	4,500	23,000	500	51,000	6,300	7,500	>S	>S	NS	NS	500	NS	>S	NS	NS

Notes:

See laboratory report for full list of analytes.

µg/L: micrograms per Liter

NS: RBC value not set for this analyte

--: analyte not tested

<: not detected above the laboratory reporting limit

>S: This groundwater RBC exceeds the solubility limit

Bold text, if present, indicates an exceedance of one or more of the cleanup levels. Values less than the regional background concentrations for metals or less than clean fill values are not bolded. In instances where a concentration exceeds clean fill criteria and a RBC value, the respective cleanup value is also bolded.

¹Oregon Risk-Based Decision-Making for the Remediation of Petroleum-Contaminated Sites, Oregon DEQ Sept. 2003, Revised RBCs May 2018.

NV: this chemical is considered nonvolatile for purposes of the exposure calculations

Appendix A

Standard Operating Procedures

Drilling and Soil Sampling
Sampling Groundwater Monitoring Wells

STANDARD OPERATING PROCEDURE

Drilling and Soil Sampling Procedures

1 PURPOSE

This Standard Operating Procedure (SOP) provides an overview of mobile drilling methods typically used during environmental investigations along with associated health and safety issues. This document outlines procedures to be followed by PBS personnel during drilling and soil sampling activities. Groundwater and soil gas sample collection through the use of drill rigs are covered under separate SOPs.

2 TYPES OF DRILL RIGS

There are three types of drilling methods that are typically used for environmental investigations: direct push, auger, and sonic. Each type of drilling method is described below. A fourth option, discussed in Section 2.4, is a hand auger tool.

2.1 Direct-Push Drilling

Direct-push drilling methods are a common drilling technology used in environmental investigations due to the small diameter borehole (two and one-quarter inch (2.25")) that generates significantly less investigation-derived waste (IDW). The rigs are hydraulically powered, and use static and percussion force to advance the drill rods. Limited access rigs are available for interior locations while track-mounted rigs allow for sampling in locations with unimproved roads.

The rods are equipped with disposable plastic liners that contain the soil retrieved for observation and sampling. The entire column of rods is removed from the ground each time to retrieve soil for sampling. The rod lengths can be 3, 4, or 5 feet. Because of this, if caving or excessive slough is a concern, the borehole may be temporarily cased to keep it clear and open during soil sample retrieval.

2.2 Hollow Stem Auger Drilling (HSA)

Hollow stem auger drilling methods use hollow corkscrew drilling flights to advance into the subsurface. The borehole is typically 11 inches in diameter, with the flights having a 6-inch inner diameter space in which to retrieve samples or construct wells. The hollow stem auger drill rigs have better capability to penetrate higher density deposits than the direct push probe method. Some direct-push rigs have the capacity to drill with hollow stem auger flights, but these rigs typically do not have the mechanical power to drill through challenging soil. The use of auger drill rigs for environmental investigations is typically for the installation and decommissioning of monitoring wells.

Soil sampling with an auger drill rig is conducted through the use of split spoon samplers or Shelby tubes deployed through the inner hollow space. Split spoon samplers are typically 2.5 feet in length and advanced by hammer weight blow into the undisturbed soil. Shelby tubes are typically used in soft deposits such as clays. Soil brought to the surface on the exterior of drilling flights is considered drill or soil cuttings. Soil samples should not be collected and analyzed from the cuttings because that soil may have come in contact with other soil or contamination from varying depths.

2.3 Rotosonic Drilling

Rotosonic drilling methods (hereafter referenced as sonic method) advance drill rod flights into the ground through the use of vibration, and full-size sonic rigs can advance rods through very challenging unconsolidated geologic formations including large cobbles. The borehole size varies but typically is 4 to 6 inches in diameter.

Due to the nature of the drilling technology, the soil can be disturbed by the vibrations, so consistency and compaction are unreliable. Soil is vibrated out of the lead flight into plastic bags for observation and sampling. The entire column of rods is removed from the ground each time to retrieve soil for sampling; if caving or excessive slough is a concern, the borehole may be temporarily cased to keep it clear during soil sample retrieval.

2.4 Hand Auger Tool

A fourth drilling option is the use of a hand auger tool, sometimes called a handheld auger. This tool, made of steel, is used to bore a hole in soil or sediments. It is intended for use only by hand and is powered by human force by twisting or screwing the tool into the soil. The soil is retrieved through a short barrel that attaches to the base of the auger rods. This tool is used for sites where the soil is relatively easy to penetrate, and when sampling is limited to the upper 5 to 10 feet of the shallow surface. Different barrels are available for coarse-grained or fine-grained material.

3 HEALTH AND SAFETY PLAN

A Health and Safety Plan (HASP) must be developed prior to fieldwork commencing. Typically, a site-specific HASP is prepared from a PBS template for drilling investigations. In all cases, pertinent safety information must be relayed to field personnel, including subcontractors, to communicate mandatory elements from the federal code for hazardous waste operations and emergency response (29 CFR 1910.120(b)(4)).

4 UTILITY LOCATES

Utility locates will be completed on all drilling projects including hand-augered sampling. The property owner or site manager should be interviewed regarding the potential location of buried utilities or other subsurface obstructions on the property. The call-in numbers are provided below. Alternately, PBS personnel can obtain log-ins to file locate requests on-line (Internet Ticket Processing, <http://www.callbeforeyoudig.org/index.asp>).

Oregon Utility Notification Center: 1-800-332-2344
Washington Utility Notification Center: 1-800-424-5555

The Utility Notification Center needs to be contacted at least 48 hours (two business days) in advance to locate utility-owned lines up to the meter (e.g., water, gas, electric), and public utilities within the public right-of-way (e.g., sewer). In addition, a private utility locating company is typically contracted to survey for private utilities such as utility lines from meters to buildings, drain lines, buried electric cables, or irrigation and sprinkler lines.

When filing utility notification requests, PBS personnel should be as specific as possible about where to locate. Washington law requires that the proposed excavation/drilling work areas are field-marked with white paint prior to the locating event.

When beginning a project, PBS personnel must carefully think through where boreholes can be safely drilled, considering both subsurface and overhead obstructions. A site walk may be prudent once the utilities have been marked and prior to the drilling fieldwork. If safe drilling conditions cannot be confirmed, the PBS Project Manager should determine if engineering controls should be implemented, such as shielding or shutting down utility and/or power lines.

SAFETY NOTE: Drill rig masts must be a safe distance from overhead power lines to prevent mast lines and power lines being moved together by wind. Occupational Safety and Health Administration (OSHA) rules for drillers require a minimum distance of 10 feet, with additional spacing required depending on the voltage carried by the power line. The drill rig subcontractor is responsible for ensuring sufficient clearance. However, PBS personnel should verify that potentially unsafe conditions do not exist.

5 SAFETY EQUIPMENT REQUIREMENTS

The following safety equipment is required for all drilling investigations:

- Hard hat
- Hearing protection (ear muffs or plugs, must be worn when drill rig is in operation)
- Safety-toe work boots
- Safety vest
- Gloves (typically disposable)
- Safety goggles or glasses
- Life vests (only when working over water)

6 FIELD EQUIPMENT AND SUPPLIES REQUIREMENTS

The following equipment is typically required for drilling projects when soil sampling will occur. Groundwater or soil gas sampling is discussed in separate SOPs. PBS personnel should confirm that the drilling contractor will provide decontamination water, soap, brushes, and buckets.

General field supplies/equipment includes:

- 5-gallon buckets
- Bags (garbage)
- Bags (plastic zipper-type)
- Camera
- Cellular telephone and phone numbers of client, project laboratory, subcontractors, etc.
- Field notebook or daily log
- Measuring tape
- Paper towels
- Pens
- Spray paint (optional)

Soil sampling supplies/equipment includes:

- Project proposal/scope of work
- Alconox/Liquinox or similar decontamination detergent
- Distilled water (for decontamination)
- Environmental borehole log forms
- Hand auger (if required by scope)
- Ice chest with blue ice or party ice
- Nitrile or other chemically compatible gloves
- Photoionization detector (PID)
- Sample chain-of-custody forms
- Sample containers (ask lab about sample volume, preservatives, etc.)
- Sampling spade or spoons (if required by scope)

7 PRE-DRILLING ACTIVITIES

The following tasks must be performed before beginning work:

- Conduct tailgate safety meeting with all field personnel, including visitors such as the client or regulator; review Health and Safety Plan.
- Install traffic cones/barrier tape or other barrier to control pedestrian and vehicle access to work area as necessary.

The drilling subcontractor is responsible to ensure that the area on which the rig is to be positioned is cleared of removable obstacles and the rig should be leveled if parked on a sloped surface. The cleared/leveled area should be large enough to accommodate the rig and supplies. PBS personnel must confirm that the work area is cleared and safe for work prior to initiating drilling activities.

8 SOIL SAMPLING PROCEDURES

8.1 Logging and Field Screening Soil

Upon retrieval of the soil, describe as per the Geo-Environmental Field Classification chart for soil (included as an attachment). Record observations on an environmental borehole log.

If conducting head-space screening with a PID, remove one-quarter to one-half cup of soil and place in a sealable plastic bag. Seal the bag, break up the soil, and let sit for a minimum of five minutes (in colder weather, either wait for 15 to 30 minutes or put into a warm car or room). The purpose of the headspace screening is to measure what is off-gassing from the sample, and sufficient time must be allowed for that to occur. After the appropriate interval, place the end of the PID probe into the bag (through a small opening in the "zipper") and record the peak value.

If performing sheen testing, place a small sample volume (preferably darker or stained material) in a bowl partially filled with water and observe sheen indicative of petroleum contamination.

8.2 Collecting Soil Samples for Laboratory Analysis

Prior to collecting a sample for laboratory analysis, the sampler should don new gloves. If there are multiple samples to be collected from a single borehole, the gloves should be replaced to avoid cross-contamination.

Collect soil samples using a gloved hand or a clean sampling tool and place directly into the sample jar(s). For volatile organic compounds (VOCs), pack the soil to minimize jar headspace, or field preserve for VOCs using EPA Method 5035 (the field kit is obtained from the laboratory). Label samples as described under Section 8.3 Sample Numbering. Place labeled sample container(s) in the cooler with ice.

8.3 Sample Identification

Sample labels will be completed and attached to the jars in the field to prevent misidentification. All sample labels will include the following information:

- Project name or number
- Sample identification
- Sample collection date and time

The sample identification is unique to a particular sample and the format must be consistently used for all samples collected at the site. The sample identification typically includes the sample location and the collection depth. The sample location is the soil boring number or otherwise designated sample location. Standard abbreviations for sample location types are:

- DP = Direct push
- MW = Monitoring well
- SB = Soil boring
- SE = Sediment
- SO = Surface soil
- SS = Soil sample
- TP = Test pit
- WP = Well point

Examples of sample identifications are: DP-5 (4'), SS-22 (1'), and MW-3 (15')

Other naming conventions may be used, as long as the labeling is consistent and each location is clearly identifiable.

9 BOREHOLE ABANDONMENT

The licensed driller is responsible for abandoning boreholes in compliance with state regulations. PBS personnel should ensure that this occurs, and that the sealing material (typically bentonite chips) is sufficiently hydrated for a proper seal. State regulations governing this are:

- Oregon Administration Rule (OAR) 690-240
- Washington Administrative Code (WAC) 173-160

10 DECONTAMINATION PROCEDURES

Minimizing the possibility of cross-contamination between samples is a critical component of a successful soil sampling project. This is achieved by consistent and thorough decontamination of sampling equipment, such as drill rods, sampling devices (split spoons, trowels, etc.), and other tools that may come in contact with soil to be sampled.

For drilling equipment, the drilling contractor is responsible for the decontamination procedures. Typically, a pressure washer with hot water or water with added detergent is used to clean drill rods and other equipment. The use of a steam cleaner is not appropriate because of the risk of burns, and steam cleaners do a poor job of removing soil particles from equipment.

For equipment and supplies used by PBS personnel, water with added detergent is typically used for decontamination. Alternately, disposable supplies, such as gloves and sampling scoops, can be used to avoid having to decontaminate them.

PBS field personnel should work with the PBS Project Manager to confirm the appropriate decontamination procedure for each project. For example, it may be important to know the source of the driller's water used for decontamination, and distilled or deionized water may need to be used to clean hand tools.

All water and sludge generated during decontamination will be captured for later disposal. Release of water directly onto the ground or into drains or catch basins is not allowed.

11 INVESTIGATION-DERIVED WASTE

Investigation-derived waste consists of soil cuttings, decontamination water, purge water (if groundwater is encountered), and personal protective equipment (e.g., nitrile gloves, rags, paper towels, Tyvek suits, disposable bailers, and tubing). All disposable personal protective equipment may be disposed of as general refuse unless otherwise instructed by the PBS Project Manager.

Soil cuttings are typically placed in 5-gallon buckets or other appropriate containers during the execution of the fieldwork, and transferred to 55-gallon drums as the project progresses. If appropriate, the cuttings may remain in buckets as long as tight-fitting lids are placed on each bucket. For some projects, the PBS Project Manager may request that decontamination/purge water be placed into the same drums as the soil, instead of keeping the two media separate. Depending on the type of contamination, this may result in cost savings for the client during disposal. Field personnel should confirm how to contain soil and water prior to each field event.

11.1 Drum Labeling

The storage containers must be labeled as hazardous, non-hazardous, or unknown pending laboratory results. The labels must be completed using an indelible marker and include:

- Date that the contents were generated
- Nature of the contents - for example:
 - Drill cuttings
 - Purged groundwater
 - Decontamination water and/or sludge
- Contact phone number in the event emergency response personnel need to identify the contents of the container.

Drums or other storage containers should be placed in as secure a location as possible, which may be a building if the exterior area is not secure from vandalism.

12 POST-DRILLING ACTIVITIES

Upon return to the office, PBS personnel should:

- Clean and calibrate equipment prior to placing back into storage. If there were any operational issues noted, they should be reported immediately to the equipment manager.
- Submit field borehole logs for electronic formatting for future reports.
- Submit the daily field notes to the PBS Project Manager for placement into the project file. If a field notebook was used, and that notebook is not dedicated to that project, a copy of those notebook pages should be submitted.

STANDARD OPERATING PROCEDURE

Sampling Groundwater Monitoring Wells

1 BACKGROUND AND PURPOSE

Groundwater samples are collected from monitoring wells for analysis of physical and chemical parameters, either by using field observations and portable equipment and/or using established laboratory analytical methods. The goal of this process is to obtain groundwater samples that are representative of the aquifer (i.e., avoiding a sample that has been impacted by surface or atmospheric conditions).

Low-flow or zero volume purging and sampling methods were developed to produce samples with the least amount of interference resulting from the collection method. Low-flow purging techniques became the industry standard for collecting a groundwater sample because the methods slow groundwater velocity to the well, minimize turbidity and agitation in the water column, and reduce the volume of purged groundwater requiring disposal. These techniques include the use of pumps dedicated to specific wells or the use of a portable pump system. A zero volume/no purging method requires installation of a collection vessel within the well prior to the sample collection event, allowing the water column within the well to equilibrate with the aquifer prior to retrieving the sample. The appropriate technique is dependent on project-specific goals and data quality requirements. Sampling methodology should be confirmed with the PBS project manager (PM) prior to preparing for groundwater monitoring.

The procedures in this Standard Operating Procedure (SOP) are specific to standard monitoring wells with a single-slotted interval. It is assumed that low-flow purging and sampling protocols are used, although these protocols can be easily adjusted for other sampling methods. Temporary borings advanced for a single field event may be sampled using the techniques presented in this SOP.

2 EQUIPMENT AND SUPPLY LIST

- Well lock keys
- Groundwater Sampling Field Form and Depth to Groundwater Field Form
- Copies of field forms and data tables from previous groundwater monitoring event
- Electronic water level probe or interface probe (if dense or light non-aqueous phase liquids [DNAPL or LNAPL] are potentially present)
- Tubing cutters, knife or scissors (note: some sites do not allow the use of a knife on-site)
- Decontamination equipment
- Measuring cup
- Safety cones
- Bolt cutters
- Replacement well caps, bolts, and padlocks
- Small cup, turkey baster, or large sponge to purge standing water inside well monument
- Fish hooks, stainless steel weight, and fishing line to retrieve objects in the well
- Site map and health and safety plan

- Personal protection equipment (PPE) required for the site, including nitrile gloves (confirm with site-specific health and safety plan)
- Submersible pump or peristaltic pump and associated equipment
- Compressed gas source (nitrogen or air compressor), battery source, or generator and fuel
- Control box
- Disposable tubing, if necessary
- Flow-through cell and water quality parameter meter (e.g. YSI model)
- Buckets or containers for purge water and drum labels
- Sample containers, labels, packaging material
- Coolers and ice for samples

3 PROCEDURE

This section outlines standard procedures used for collecting groundwater samples from a monitoring well. Project Managers may modify or remove tasks as dictated by project needs; for example, turbidity or depth-to-bottom measurements may not be warranted at a site with sufficiently developed wells.

Preparation for a monitoring event begins in the office. The first step is to read the scope of work (e.g., proposal, sampling and analysis plan (SAP), work plan) to determine the number and location of monitoring wells to be sampled, health and safety considerations, quality control (QC) samples needed, sample containers required, and equipment needed for the site (peristaltic pump, bladder pump, both, etc.). Recommended preplanning procedures are as follows:

- Prepare, review, or update Health and Safety Plan (HASP) for the site.
- Obtain appropriate PPE for the site (e.g., hard hat, safety vest, gloves, safety glasses, life vest, flame retardant [FR] shirt or other client-required PPE).
- Determine number and type of samples to be collected.
- Determine which laboratory can meet analytical requirements (required analysis, screening levels).
- Order sample containers from laboratory, making sure to order QC sample containers and at least one extra set of containers. Ensure that a Safety Data Sheet (SDS) is provided for any sample preservative supplied by the laboratory.
- Print all forms needed for sampling event (work plan, HASP, depth to water forms, groundwater sampling forms, labels, chain of custody, etc.).
- Schedule PBS vehicle and equipment use on PBS calendars, as warranted.
- Order rental equipment for sampling event, if not available internally.

After arriving at the site, the following procedures should be followed:

- Don appropriate PPE and place safety cones around the work zone, if required by the HASP or deemed necessary by site conditions.
- Open all of the monitoring wells on-site and wait a minimum of 15 minutes for water levels to approach an equilibrium state with atmospheric pressure before taking any measurements.

- Note the general condition of the well on the depth to groundwater field form. Check well for damage or evidence of tampering, and record pertinent observations. Note any maintenance tasks that should be completed, such as well cap or padlock replacement.
- Collect depth to water measurements from each monitoring well, decontaminating the probe between locations. If possible, gauging should be conducted in order from the least to the most contaminated well. The measurements should be collected from all wells prior to beginning sample collection, unless project scope or site conditions indicate otherwise.
- Measure the depth to water relative to the marking on the well casings. If there is no mark, use the north side of the casing. Record the water level on the depth to groundwater field form. Note if DNAPL or LNAPL is present (this typically requires a meter capable of detecting NAPL-water interfaces). If NAPL is present, additional decontamination procedures will be warranted.
- Measure depth to bottom of well to record if sedimentation in the well has occurred.
- Make sure all information is completed on the depth to groundwater field form and sign and date it.

Sampling a groundwater monitoring well utilizing low-flow techniques relies on stabilization of field water quality parameters to determine when groundwater is representative of aquifer conditions. Measurement of groundwater quality parameters with a water quality parameter meter occurs in a closed system in which groundwater does not come in contact with open air; this is important for valid measurements because dissolved oxygen (DO), oxidation-reduction potential (ORP), and pH measurements can be sensitive to reactions with the atmosphere. A flow-through cell (flow cell) connected to the water quality parameter meter provides this closed system and is used to measure field parameters prior to collecting groundwater samples. Stabilization of selected parameters indicates that collected groundwater is representative of the aquifer and conditions are suitable for sampling to begin. See protocol below for stabilization parameters.

Low-flow purge and sample methods require care when placing a portable pump and/or tubing in the well to minimize disturbance to the water column. Pumping rates must be maintained at 0.1 to 0.5 liter per minute to reduce drawdown; the pump should never be run higher than 0.5 liters per minute prior to sampling.

For monitoring wells, sampling should proceed as follows:

- If using a portable pump setup, slowly lower the pump or tubing to the midpoint of the screen or sample interval. Secure the pump or tubing at the surface to prevent it from moving (not applicable if using dedicated pumps).
- Connect the bladder pump (attaching control box, compressor or nitrogen tank with regulator) or peristaltic pump to flow cell containing water quality parameter probes. Place the water level probe in the well so water levels can be measured as you are pumping. Start the pump and adjust the pumping rate to between 0.1 and 0.5 liters per minute (using a measuring cup to calculate the flow rate). Begin recording readings on the groundwater sampling field form. Be sure to purge the initial volume of water in the tubing before taking a reading.
- During purging, record readings of groundwater parameters (listed below) and water level every 3 to 5 minutes on the groundwater sampling field form. A drawdown of less than 0.3 feet in the water column, once the pumping rate has stabilized, is desirable; however, less permeable aquifer material or a clogged well filter pack may result in a deeper drawdown. At a minimum, the depth-to-water should be stabilized for three consecutive readings taken between 3 to 5 minutes apart (in conjunction with the stabilization of the other parameters). Visually describe and record turbidity. Purging is considered complete when the groundwater parameters have stabilized for three consecutive readings.

Field Parameter	Stabilization Goal
Temperature	+/-3%
Specific Conductance	+/- 3% mS/cm
pH	+/- 0.1 pH units
DO	+/- 10% or +/- 0.3 mg/L
ORP	+/- 10 millivolts
Depth to Water	+/- 0.3 feet

Please note that multi-parameter meters may have a resolution greater than the stabilization goal. Note the meter capabilities. If the field parameters do not stabilize within the stabilization goal, but are within the resolution of the meter, it may be acceptable to collect a sample in this scenario. This MUST be noted on the field form.

- Measure turbidity of the sample water using field instruments prior to sample collection and upon any obvious visual changes in turbidity during sample collection.
- Prior to collecting the water sample, the tubing originating in the well must be disconnected from the influent (inflow) side of the flow cell.
- Directly fill the sample containers from the tubing originating in the well. If you are collecting samples for volatile organic compound (VOC) analysis, you may need to decrease the pump rate to minimize volatilization of compounds from the sample; if this is the case, other samples should be collected first. You may restore the flow rate upon completion of filling sample containers for VOC analysis. Fill unpreserved bottles first. Filtered samples should be collected after all other samples have been collected.
- Groundwater samples collected for VOC analysis must be collected with zero headspace in the sample vial. This can be confirmed by gently tapping the sealed vial against a gloved hand to ensure that air bubbles are not present.
- If a duplicate sample is required for the well, it should be filled concurrently with the regular sample. This is accomplished by alternating bottles of the same type during sample collection (e.g., filling one bottle from each sample, then the second bottle from each sample.)
- Groundwater samples for dissolved metals analysis must be field filtered with a 0.45 micron filter directly connected to the tubing. Mark "field filtered" or "FF" on the bottle label, field form, and chain of custody.
- Prior to filling or just after filling, label each bottle with the project name, sample name, and sample date and time, and make sure it is properly sealed. The sample containers may also be labeled with what analysis will be performed (confirm with Project Manager). Place in a cooler with ice and pack for transportation.
- As necessary, pull pump and discard tubing. Decontaminate the pump based on the decontamination procedures established for the site.
- Make sure all information is completed on the groundwater field form and sign and date it.
- Close and lock the well.
- Contain purge and decontamination water in the appropriate containers as established for the project.
- Dispose of used sampling supplies and other waste in appropriate container as established for the project.

If low-flow sampling is not used at the site, these procedures should be modified as appropriate. The objective is to provide high-quality groundwater samples representative of the aquifer. Modifications to this SOP should keep this objective in mind at all times.

After fieldwork is completed:

- Ensure that chain-of-custody form has necessary information including site name, project manager, sample names, date and time collected, requested analysis, special notes (field filtered, MS/MSD, etc.).
- Scan and save field sheets to project folder on server. Retain original field copies in project folder; these are legal documents and should be retained as per PBS guidelines for document retention.
- Report any sampling or well maintenance issues to the project manager for evaluation and remedy.
- Clean and store PBS equipment for use on next project. Report any equipment damage or malfunctions or missing/depleted calibration solutions to the office equipment manager.
- Ship rental equipment back to vendor immediately to minimize project costs. Borrowed PBS equipment should be returned promptly to the lending office.

References

Puls, R.W. and M.J. Barcelona. *Groundwater Issue Paper: Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures*. US Environmental Protection Agency, EPA 540-S-95-504 (1996).

Yeskis, D. and Bernard Zavala. *Groundwater Issue Paper: Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers*. US Environmental Protection Agency, EPA 542-S-02-001 (May 2002).

Appendix B

Laboratory Reports



ANALYTICAL REPORT

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Wednesday, May 24, 2023

Nick Thornton
PBS Engineering and Environmental
4412 S Corbett Ave
Portland, OR 97239

RE: A3E1233 - Alsea Hwy - 24422.000

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A3E1233, which was received by the laboratory on 5/10/2023 at 12:00:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: jwoodcock@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample receipt, unless prior arrangements have been made.

Cooler Receipt Information

(See Cooler Receipt Form for details)

Cooler #1	0.8 degC	Cooler #2	3.6 degC
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This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.

All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.



Apex Laboratories

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Jason Woodcock, Project Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

<u>PBS Engineering and Environmental</u> 4412 S Corbett Ave Portland, OR 97239	Project: <u>Alesea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW4	A3E1233-01	Water	05/08/23 11:30	05/10/23 12:00
MW1	A3E1233-02	Water	05/08/23 12:00	05/10/23 12:00
TP1-5.0	A3E1233-03	Soil	05/08/23 13:30	05/10/23 12:00
TP1-10.0	A3E1233-04	Soil	05/08/23 13:45	05/10/23 12:00
TP2-5.0	A3E1233-05	Soil	05/08/23 14:00	05/10/23 12:00
TP2-10.0	A3E1233-06	Soil	05/08/23 14:10	05/10/23 12:00
TP3-6.0	A3E1233-07	Soil	05/08/23 14:30	05/10/23 12:00
TP3-10.0	A3E1233-08	Soil	05/08/23 14:45	05/10/23 12:00
TP4-9.0	A3E1233-09	Soil	05/08/23 15:30	05/10/23 12:00
TP2-GW	A3E1233-10	Water	05/09/23 08:30	05/10/23 12:00
TP5-10.0	A3E1233-11	Soil	05/09/23 09:00	05/10/23 12:00
TP1-GW	A3E1233-12	Water	05/09/23 09:30	05/10/23 12:00
TP6-10.0	A3E1233-13	Soil	05/09/23 10:45	05/10/23 12:00
TP7-1.0	A3E1233-14	Soil	05/09/23 11:30	05/10/23 12:00
TP7-10.0	A3E1233-15	Soil	05/09/23 11:45	05/10/23 12:00
TP8-8.0	A3E1233-16	Soil	05/09/23 13:30	05/10/23 12:00
TP9-8.0	A3E1233-17	Soil	05/09/23 14:15	05/10/23 12:00
TP10-8.0	A3E1233-18	Soil	05/09/23 14:45	05/10/23 12:00
TP11-8.0	A3E1233-19	Soil	05/09/23 15:15	05/10/23 12:00
TP6-GW	A3E1233-20	Water	05/09/23 12:00	05/10/23 12:00
TB20230508	A3E1233-21	Water	05/08/23 07:00	05/10/23 12:00

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Jason Woodcock, Project Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: <u>Aalsea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW4 (A3E1233-01RE1)				Matrix: Water		Batch: 23E0689		
Diesel	213	---	189	ug/L	1	05/17/23 09:27	NWTPH-Dx	F-11
Oil	ND	---	377	ug/L	1	05/17/23 09:27	NWTPH-Dx	
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: 118 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>	<i>05/17/23 09:27</i>	<i>NWTPH-Dx</i>
MW1 (A3E1233-02RE1)				Matrix: Water		Batch: 23E0689		
Diesel	ND	---	189	ug/L	1	05/17/23 09:48	NWTPH-Dx	
Oil	ND	---	377	ug/L	1	05/17/23 09:48	NWTPH-Dx	
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: 113 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>	<i>05/17/23 09:48</i>	<i>NWTPH-Dx</i>
TP1-5.0 (A3E1233-03)				Matrix: Soil		Batch: 23E0662		
Diesel	1280	---	27.6	mg/kg dry	1	05/16/23 18:04	NWTPH-Dx	F-11, F-15
Oil	1250	---	55.2	mg/kg dry	1	05/16/23 18:04	NWTPH-Dx	F-03, F-16
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: 98 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>	<i>05/16/23 18:04</i>	<i>NWTPH-Dx</i>
TP1-10.0 (A3E1233-04)				Matrix: Soil		Batch: 23E0662		
Diesel	ND	---	28.0	mg/kg dry	1	05/16/23 19:06	NWTPH-Dx	
Oil	ND	---	56.1	mg/kg dry	1	05/16/23 19:06	NWTPH-Dx	
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: 88 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>	<i>05/16/23 19:06</i>	<i>NWTPH-Dx</i>
TP2-5.0 (A3E1233-05RE1)				Matrix: Soil		Batch: 23E0662		
Diesel	5350	---	270	mg/kg dry	10	05/17/23 13:11	NWTPH-Dx	
Oil	ND	---	540	mg/kg dry	10	05/17/23 13:11	NWTPH-Dx	
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: 113 %</i>		<i>Limits: 50-150 %</i>		<i>10</i>	<i>05/17/23 13:11</i>	<i>NWTPH-Dx</i>
TP2-10.0 (A3E1233-06RE1)				Matrix: Soil		Batch: 23E0662		
Diesel	11100	---	548	mg/kg dry	20	05/17/23 13:32	NWTPH-Dx	
Oil	ND	---	1100	mg/kg dry	20	05/17/23 13:32	NWTPH-Dx	
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: %</i>		<i>Limits: 50-150 %</i>		<i>20</i>	<i>05/17/23 13:32</i>	<i>NWTPH-Dx</i>
TP3-6.0 (A3E1233-07)				Matrix: Soil		Batch: 23E0662		
Diesel	63.7	---	28.3	mg/kg dry	1	05/16/23 20:09	NWTPH-Dx	F-11
Oil	ND	---	56.6	mg/kg dry	1	05/16/23 20:09	NWTPH-Dx	
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: 81 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>	<i>05/16/23 20:09</i>	<i>NWTPH-Dx</i>
TP3-10.0 (A3E1233-08)				Matrix: Soil		Batch: 23E0662		
Diesel	1050	---	28.1	mg/kg dry	1	05/16/23 20:29	NWTPH-Dx	

Apex Laboratories

Jason Woodcock, Project Manager

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: <u>Aalsea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
TP3-10.0 (A3E1233-08)				Matrix: Soil		Batch: 23E0662		
Oil	ND	---	56.3	mg/kg dry	1	05/16/23 20:29	NWTPH-Dx	
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: 89 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>	<i>05/16/23 20:29</i>	<i>NWTPH-Dx</i>
TP4-9.0 (A3E1233-09)				Matrix: Soil		Batch: 23E0662		
Diesel	ND	---	26.6	mg/kg dry	1	05/16/23 20:50	NWTPH-Dx	
Oil	316	---	53.2	mg/kg dry	1	05/16/23 20:50	NWTPH-Dx	
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: 98 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>	<i>05/16/23 20:50</i>	<i>NWTPH-Dx</i>
TP2-GW (A3E1233-10RE1)				Matrix: Water		Batch: 23E0689		
Diesel	32900	---	392	ug/L	2	05/17/23 10:29	NWTPH-Dx	
Oil	ND	---	784	ug/L	2	05/17/23 10:29	NWTPH-Dx	
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: 138 %</i>		<i>Limits: 50-150 %</i>		<i>2</i>	<i>05/17/23 10:29</i>	<i>NWTPH-Dx</i>
TP5-10.0 (A3E1233-11)				Matrix: Soil		Batch: 23E0662		
Diesel	ND	---	28.0	mg/kg dry	1	05/16/23 21:32	NWTPH-Dx	
Oil	ND	---	56.0	mg/kg dry	1	05/16/23 21:32	NWTPH-Dx	
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: 75 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>	<i>05/16/23 21:32</i>	<i>NWTPH-Dx</i>
TP1-GW (A3E1233-12RE1)				Matrix: Water		Batch: 23E0689		
Diesel	526	---	200	ug/L	1	05/17/23 10:09	NWTPH-Dx	F-11
Oil	ND	---	400	ug/L	1	05/17/23 10:09	NWTPH-Dx	
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: 109 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>	<i>05/17/23 10:09</i>	<i>NWTPH-Dx</i>
TP6-10.0 (A3E1233-13RE1)				Matrix: Soil		Batch: 23E0662		
Diesel	4450	---	60.0	mg/kg dry	2	05/17/23 13:53	NWTPH-Dx	
Oil	ND	---	120	mg/kg dry	2	05/17/23 13:53	NWTPH-Dx	
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: 116 %</i>		<i>Limits: 50-150 %</i>		<i>2</i>	<i>05/17/23 13:53</i>	<i>NWTPH-Dx</i>
TP7-1.0 (A3E1233-14RE1)				Matrix: Soil		Batch: 23E0662		
Diesel	ND	---	28.8	mg/kg dry	1	05/17/23 11:35	NWTPH-Dx	
Oil	ND	---	57.6	mg/kg dry	1	05/17/23 11:35	NWTPH-Dx	
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: 86 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>	<i>05/17/23 11:35</i>	<i>NWTPH-Dx</i>
TP7-10.0 (A3E1233-15)				Matrix: Soil		Batch: 23E0662		
Diesel	ND	---	28.6	mg/kg dry	1	05/16/23 22:34	NWTPH-Dx	
Oil	ND	---	57.2	mg/kg dry	1	05/16/23 22:34	NWTPH-Dx	

Apex Laboratories

Jason Woodcock, Project Manager

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: <u>Aalsea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
TP7-10.0 (A3E1233-15)				Matrix: Soil		Batch: 23E0662		
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: 67 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>		<i>05/16/23 22:34 NWTPH-Dx</i>
TP8-8.0 (A3E1233-16)				Matrix: Soil		Batch: 23E0662		
Diesel	ND	---	26.3	mg/kg dry	1	05/17/23 00:17	NWTPH-Dx	
Oil	ND	---	52.7	mg/kg dry	1	05/17/23 00:17	NWTPH-Dx	
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: 86 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>		<i>05/17/23 00:17 NWTPH-Dx</i>
TP9-8.0 (A3E1233-17)				Matrix: Soil		Batch: 23E0662		
Diesel	583	---	27.1	mg/kg dry	1	05/17/23 00:38	NWTPH-Dx	
Oil	ND	---	54.2	mg/kg dry	1	05/17/23 00:38	NWTPH-Dx	
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: 93 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>		<i>05/17/23 00:38 NWTPH-Dx</i>
TP10-8.0 (A3E1233-18)				Matrix: Soil		Batch: 23E0662		
Diesel	ND	---	26.5	mg/kg dry	1	05/17/23 00:59	NWTPH-Dx	
Oil	ND	---	53.0	mg/kg dry	1	05/17/23 00:59	NWTPH-Dx	
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: 84 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>		<i>05/17/23 00:59 NWTPH-Dx</i>
TP11-8.0 (A3E1233-19)				Matrix: Soil		Batch: 23E0662		
Diesel	ND	---	27.1	mg/kg dry	1	05/17/23 01:19	NWTPH-Dx	
Oil	ND	---	54.2	mg/kg dry	1	05/17/23 01:19	NWTPH-Dx	
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: 87 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>		<i>05/17/23 01:19 NWTPH-Dx</i>
TP6-GW (A3E1233-20)				Matrix: Water		Batch: 23E0689		
Diesel	1870	---	202	ug/L	1	05/17/23 01:04	NWTPH-Dx	F-20
Oil	ND	---	404	ug/L	1	05/17/23 01:04	NWTPH-Dx	
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>		<i>05/17/23 01:04 NWTPH-Dx</i>

Apex Laboratories

Jason Woodcock, Project Manager

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: <u>Alesea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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ANALYTICAL SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW4 (A3E1233-01)				Matrix: Water		Batch: 23E0432		
Gasoline Range Organics	ND	---	100	ug/L	1	05/11/23 12:57	NWTPH-Gx (MS)	
<i>Surrogate: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 98 %</i>		<i>Limits: 50-150 %</i>	<i>1</i>	<i>05/11/23 12:57</i>	<i>NWTPH-Gx (MS)</i>	
<i>1,4-Difluorobenzene (Sur)</i>			<i>103 %</i>	<i>50-150 %</i>	<i>1</i>	<i>05/11/23 12:57</i>	<i>NWTPH-Gx (MS)</i>	
MW1 (A3E1233-02)				Matrix: Water		Batch: 23E0432		
Gasoline Range Organics	ND	---	100	ug/L	1	05/11/23 13:41	NWTPH-Gx (MS)	
<i>Surrogate: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 96 %</i>		<i>Limits: 50-150 %</i>	<i>1</i>	<i>05/11/23 13:41</i>	<i>NWTPH-Gx (MS)</i>	
<i>1,4-Difluorobenzene (Sur)</i>			<i>103 %</i>	<i>50-150 %</i>	<i>1</i>	<i>05/11/23 13:41</i>	<i>NWTPH-Gx (MS)</i>	
TP1-5.0 (A3E1233-03)				Matrix: Soil		Batch: 23E0496		
Gasoline Range Organics	27.3	---	8.85	mg/kg dry	50	05/11/23 13:44	NWTPH-Gx (MS)	
<i>Surrogate: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 112 %</i>		<i>Limits: 50-150 %</i>	<i>1</i>	<i>05/11/23 13:44</i>	<i>NWTPH-Gx (MS)</i>	
<i>1,4-Difluorobenzene (Sur)</i>			<i>102 %</i>	<i>50-150 %</i>	<i>1</i>	<i>05/11/23 13:44</i>	<i>NWTPH-Gx (MS)</i>	
TP1-10.0 (A3E1233-04)				Matrix: Soil		Batch: 23E0496		
Gasoline Range Organics	ND	---	8.96	mg/kg dry	50	05/11/23 14:36	NWTPH-Gx (MS)	
<i>Surrogate: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 110 %</i>		<i>Limits: 50-150 %</i>	<i>1</i>	<i>05/11/23 14:36</i>	<i>NWTPH-Gx (MS)</i>	
<i>1,4-Difluorobenzene (Sur)</i>			<i>103 %</i>	<i>50-150 %</i>	<i>1</i>	<i>05/11/23 14:36</i>	<i>NWTPH-Gx (MS)</i>	
TP2-5.0 (A3E1233-05)				Matrix: Soil		Batch: 23E0496		
Gasoline Range Organics	1690	---	34.5	mg/kg dry	200	05/11/23 22:15	NWTPH-Gx (MS)	
<i>Surrogate: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 105 %</i>		<i>Limits: 50-150 %</i>	<i>1</i>	<i>05/11/23 22:15</i>	<i>NWTPH-Gx (MS)</i>	
<i>1,4-Difluorobenzene (Sur)</i>			<i>102 %</i>	<i>50-150 %</i>	<i>1</i>	<i>05/11/23 22:15</i>	<i>NWTPH-Gx (MS)</i>	
TP2-10.0 (A3E1233-06)				Matrix: Soil		Batch: 23E0496		
Gasoline Range Organics	1270	---	17.6	mg/kg dry	100	05/11/23 21:49	NWTPH-Gx (MS)	
<i>Surrogate: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 102 %</i>		<i>Limits: 50-150 %</i>	<i>1</i>	<i>05/11/23 21:49</i>	<i>NWTPH-Gx (MS)</i>	
<i>1,4-Difluorobenzene (Sur)</i>			<i>103 %</i>	<i>50-150 %</i>	<i>1</i>	<i>05/11/23 21:49</i>	<i>NWTPH-Gx (MS)</i>	
TP3-6.0 (A3E1233-07)				Matrix: Soil		Batch: 23E0496		
Gasoline Range Organics	ND	---	8.94	mg/kg dry	50	05/11/23 15:01	NWTPH-Gx (MS)	
<i>Surrogate: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 108 %</i>		<i>Limits: 50-150 %</i>	<i>1</i>	<i>05/11/23 15:01</i>	<i>NWTPH-Gx (MS)</i>	
<i>1,4-Difluorobenzene (Sur)</i>			<i>103 %</i>	<i>50-150 %</i>	<i>1</i>	<i>05/11/23 15:01</i>	<i>NWTPH-Gx (MS)</i>	
TP3-10.0 (A3E1233-08)				Matrix: Soil		Batch: 23E0496		
Gasoline Range Organics	23.5	---	8.57	mg/kg dry	50	05/11/23 15:26	NWTPH-Gx (MS)	

Apex Laboratories

Jason Woodcock, Project Manager

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: <u>Aalsea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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ANALYTICAL SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
TP3-10.0 (A3E1233-08)				Matrix: Soil		Batch: 23E0496		
<i>Surrogate: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 108 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>		<i>05/11/23 15:26 NWTPH-Gx (MS)</i>
<i>1,4-Difluorobenzene (Sur)</i>		<i>103 %</i>		<i>50-150 %</i>		<i>1</i>		<i>05/11/23 15:26 NWTPH-Gx (MS)</i>
TP4-9.0 (A3E1233-09)				Matrix: Soil		Batch: 23E0496		
Gasoline Range Organics	ND	---	7.29	mg/kg dry	50	05/11/23 15:52	NWTPH-Gx (MS)	
<i>Surrogate: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 113 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>		<i>05/11/23 15:52 NWTPH-Gx (MS)</i>
<i>1,4-Difluorobenzene (Sur)</i>		<i>102 %</i>		<i>50-150 %</i>		<i>1</i>		<i>05/11/23 15:52 NWTPH-Gx (MS)</i>
TP2-GW (A3E1233-10)				Matrix: Water		Batch: 23E0432		
Gasoline Range Organics	2790	---	100	ug/L	1	05/11/23 14:04	NWTPH-Gx (MS)	
<i>Surrogate: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 106 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>		<i>05/11/23 14:04 NWTPH-Gx (MS)</i>
<i>1,4-Difluorobenzene (Sur)</i>		<i>102 %</i>		<i>50-150 %</i>		<i>1</i>		<i>05/11/23 14:04 NWTPH-Gx (MS)</i>
TP5-10.0 (A3E1233-11)				Matrix: Soil		Batch: 23E0496		
Gasoline Range Organics	ND	---	8.53	mg/kg dry	50	05/11/23 16:17	NWTPH-Gx (MS)	
<i>Surrogate: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 109 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>		<i>05/11/23 16:17 NWTPH-Gx (MS)</i>
<i>1,4-Difluorobenzene (Sur)</i>		<i>104 %</i>		<i>50-150 %</i>		<i>1</i>		<i>05/11/23 16:17 NWTPH-Gx (MS)</i>
TP1-GW (A3E1233-12)				Matrix: Water		Batch: 23E0432		
Gasoline Range Organics	ND	---	100	ug/L	1	05/11/23 14:26	NWTPH-Gx (MS)	
<i>Surrogate: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 93 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>		<i>05/11/23 14:26 NWTPH-Gx (MS)</i>
<i>1,4-Difluorobenzene (Sur)</i>		<i>93 %</i>		<i>50-150 %</i>		<i>1</i>		<i>05/11/23 14:26 NWTPH-Gx (MS)</i>
TP6-10.0 (A3E1233-13)				Matrix: Soil		Batch: 23E0496		
Gasoline Range Organics	170	---	10.2	mg/kg dry	50	05/11/23 16:43	NWTPH-Gx (MS)	
<i>Surrogate: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 112 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>		<i>05/11/23 16:43 NWTPH-Gx (MS)</i>
<i>1,4-Difluorobenzene (Sur)</i>		<i>103 %</i>		<i>50-150 %</i>		<i>1</i>		<i>05/11/23 16:43 NWTPH-Gx (MS)</i>
TP7-1.0 (A3E1233-14)				Matrix: Soil		Batch: 23E0496		
Gasoline Range Organics	ND	---	10.5	mg/kg dry	50	05/11/23 17:08	NWTPH-Gx (MS)	
<i>Surrogate: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 112 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>		<i>05/11/23 17:08 NWTPH-Gx (MS)</i>
<i>1,4-Difluorobenzene (Sur)</i>		<i>103 %</i>		<i>50-150 %</i>		<i>1</i>		<i>05/11/23 17:08 NWTPH-Gx (MS)</i>
TP7-10.0 (A3E1233-15)				Matrix: Soil		Batch: 23E0496		
Gasoline Range Organics	ND	---	8.78	mg/kg dry	50	05/11/23 17:34	NWTPH-Gx (MS)	
<i>Surrogate: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 109 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>		<i>05/11/23 17:34 NWTPH-Gx (MS)</i>

Apex Laboratories

Jason Woodcock, Project Manager

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: Aalsea Hwy Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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ANALYTICAL SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
TP7-10.0 (A3E1233-15)				Matrix: Soil		Batch: 23E0496		
<i>Surrogate: 1,4-Difluorobenzene (Sur)</i>		<i>Recovery: 102 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>	<i>05/11/23 17:34</i>	<i>NWTPH-Gx (MS)</i>
TP8-8.0 (A3E1233-16)				Matrix: Soil		Batch: 23E0496		
Gasoline Range Organics	ND	---	8.63	mg/kg dry	50	05/11/23 18:00	NWTPH-Gx (MS)	
<i>Surrogate: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 108 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>	<i>05/11/23 18:00</i>	<i>NWTPH-Gx (MS)</i>
<i>1,4-Difluorobenzene (Sur)</i>		<i>104 %</i>		<i>50-150 %</i>		<i>1</i>	<i>05/11/23 18:00</i>	<i>NWTPH-Gx (MS)</i>
TP9-8.0 (A3E1233-17)				Matrix: Soil		Batch: 23E0496		
Gasoline Range Organics	316	---	8.18	mg/kg dry	50	05/11/23 18:25	NWTPH-Gx (MS)	
<i>Surrogate: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 112 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>	<i>05/11/23 18:25</i>	<i>NWTPH-Gx (MS)</i>
<i>1,4-Difluorobenzene (Sur)</i>		<i>104 %</i>		<i>50-150 %</i>		<i>1</i>	<i>05/11/23 18:25</i>	<i>NWTPH-Gx (MS)</i>
TP10-8.0 (A3E1233-18)				Matrix: Soil		Batch: 23E0496		
Gasoline Range Organics	ND	---	8.04	mg/kg dry	50	05/11/23 18:51	NWTPH-Gx (MS)	
<i>Surrogate: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 110 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>	<i>05/11/23 18:51</i>	<i>NWTPH-Gx (MS)</i>
<i>1,4-Difluorobenzene (Sur)</i>		<i>102 %</i>		<i>50-150 %</i>		<i>1</i>	<i>05/11/23 18:51</i>	<i>NWTPH-Gx (MS)</i>
TP11-8.0 (A3E1233-19)				Matrix: Soil		Batch: 23E0496		
Gasoline Range Organics	ND	---	8.53	mg/kg dry	50	05/11/23 19:16	NWTPH-Gx (MS)	
<i>Surrogate: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 111 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>	<i>05/11/23 19:16</i>	<i>NWTPH-Gx (MS)</i>
<i>1,4-Difluorobenzene (Sur)</i>		<i>102 %</i>		<i>50-150 %</i>		<i>1</i>	<i>05/11/23 19:16</i>	<i>NWTPH-Gx (MS)</i>
TP6-GW (A3E1233-20)				Matrix: Water		Batch: 23E0432		
Gasoline Range Organics	1830	---	100	ug/L	1	05/11/23 14:48	NWTPH-Gx (MS)	
<i>Surrogate: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 99 %</i>		<i>Limits: 50-150 %</i>		<i>1</i>	<i>05/11/23 14:48</i>	<i>NWTPH-Gx (MS)</i>
<i>1,4-Difluorobenzene (Sur)</i>		<i>95 %</i>		<i>50-150 %</i>		<i>1</i>	<i>05/11/23 14:48</i>	<i>NWTPH-Gx (MS)</i>

Apex Laboratories

Jason Woodcock, Project Manager

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

PBS Engineering and Environmental	Project: Alsea Hwy	
4412 S Corbett Ave	Project Number: 24422.000	Report ID:
Portland, OR 97239	Project Manager: Nick Thornton	A3E1233 - 05 24 23 1039

ANALYTICAL SAMPLE RESULTS

BTEX+N Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW4 (A3E1233-01)				Matrix: Water		Batch: 23E0432		
Benzene	ND	---	0.200	ug/L	1	05/11/23 12:57	EPA 8260D	
Toluene	ND	---	1.00	ug/L	1	05/11/23 12:57	EPA 8260D	
Ethylbenzene	ND	---	0.500	ug/L	1	05/11/23 12:57	EPA 8260D	
Xylenes, total	ND	---	1.50	ug/L	1	05/11/23 12:57	EPA 8260D	
Naphthalene	ND	---	2.00	ug/L	1	05/11/23 12:57	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 91 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>05/11/23 12:57</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>		<i>1</i>	<i>05/11/23 12:57</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>106 %</i>		<i>80-120 %</i>		<i>1</i>	<i>05/11/23 12:57</i>	<i>EPA 8260D</i>
MW1 (A3E1233-02)				Matrix: Water		Batch: 23E0432		
Benzene	ND	---	0.200	ug/L	1	05/11/23 13:41	EPA 8260D	
Toluene	ND	---	1.00	ug/L	1	05/11/23 13:41	EPA 8260D	
Ethylbenzene	ND	---	0.500	ug/L	1	05/11/23 13:41	EPA 8260D	
Xylenes, total	ND	---	1.50	ug/L	1	05/11/23 13:41	EPA 8260D	
Naphthalene	ND	---	2.00	ug/L	1	05/11/23 13:41	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 89 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>05/11/23 13:41</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>1</i>	<i>05/11/23 13:41</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>101 %</i>		<i>80-120 %</i>		<i>1</i>	<i>05/11/23 13:41</i>	<i>EPA 8260D</i>
TP1-5.0 (A3E1233-03)				Matrix: Soil		Batch: 23E0496		
Benzene	ND	---	0.0177	mg/kg dry	50	05/11/23 13:44	5035A/8260D	
Toluene	ND	---	0.0885	mg/kg dry	50	05/11/23 13:44	5035A/8260D	
Ethylbenzene	ND	---	0.0442	mg/kg dry	50	05/11/23 13:44	5035A/8260D	
Xylenes, total	ND	---	0.133	mg/kg dry	50	05/11/23 13:44	5035A/8260D	
Naphthalene	ND	---	0.177	mg/kg dry	50	05/11/23 13:44	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 104 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>05/11/23 13:44</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>94 %</i>		<i>80-120 %</i>		<i>1</i>	<i>05/11/23 13:44</i>	<i>5035A/8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>100 %</i>		<i>79-120 %</i>		<i>1</i>	<i>05/11/23 13:44</i>	<i>5035A/8260D</i>
TP1-10.0 (A3E1233-04)				Matrix: Soil		Batch: 23E0496		
Benzene	ND	---	0.0179	mg/kg dry	50	05/11/23 14:36	5035A/8260D	
Toluene	ND	---	0.0896	mg/kg dry	50	05/11/23 14:36	5035A/8260D	
Ethylbenzene	ND	---	0.0448	mg/kg dry	50	05/11/23 14:36	5035A/8260D	
Xylenes, total	ND	---	0.134	mg/kg dry	50	05/11/23 14:36	5035A/8260D	
Naphthalene	ND	---	0.179	mg/kg dry	50	05/11/23 14:36	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 105 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>05/11/23 14:36</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>95 %</i>		<i>80-120 %</i>		<i>1</i>	<i>05/11/23 14:36</i>	<i>5035A/8260D</i>

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Jason Woodcock, Project Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: <u>Alesea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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ANALYTICAL SAMPLE RESULTS

BTEX+N Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes	
TP1-10.0 (A3E1233-04)				Matrix: Soil		Batch: 23E0496			
<i>Surrogate: 4-Bromofluorobenzene (Surr)</i>		<i>Recovery: 98 %</i>		<i>Limits: 79-120 %</i>		<i>1</i>		<i>05/11/23 14:36</i>	<i>5035A/8260D</i>
TP2-10.0 (A3E1233-06)				Matrix: Soil		Batch: 23E0496			
Benzene	ND	---	0.0352	mg/kg dry	100	05/11/23 21:49	5035A/8260D		
Toluene	ND	---	0.176	mg/kg dry	100	05/11/23 21:49	5035A/8260D		
Ethylbenzene	0.102	---	0.0879	mg/kg dry	100	05/11/23 21:49	5035A/8260D		
Xylenes, total	ND	---	0.264	mg/kg dry	100	05/11/23 21:49	5035A/8260D		
Naphthalene	19.0	---	0.352	mg/kg dry	100	05/11/23 21:49	5035A/8260D		
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 104 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>		<i>05/11/23 21:49</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>1</i>		<i>05/11/23 21:49</i>	<i>5035A/8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>97 %</i>		<i>79-120 %</i>		<i>1</i>		<i>05/11/23 21:49</i>	<i>5035A/8260D</i>
TP3-6.0 (A3E1233-07)				Matrix: Soil		Batch: 23E0496			
Benzene	ND	---	0.0179	mg/kg dry	50	05/11/23 15:01	5035A/8260D		
Toluene	ND	---	0.0894	mg/kg dry	50	05/11/23 15:01	5035A/8260D		
Ethylbenzene	ND	---	0.0447	mg/kg dry	50	05/11/23 15:01	5035A/8260D		
Xylenes, total	ND	---	0.134	mg/kg dry	50	05/11/23 15:01	5035A/8260D		
Naphthalene	ND	---	0.179	mg/kg dry	50	05/11/23 15:01	5035A/8260D		
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 106 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>		<i>05/11/23 15:01</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>95 %</i>		<i>80-120 %</i>		<i>1</i>		<i>05/11/23 15:01</i>	<i>5035A/8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>79-120 %</i>		<i>1</i>		<i>05/11/23 15:01</i>	<i>5035A/8260D</i>
TP3-10.0 (A3E1233-08)				Matrix: Soil		Batch: 23E0496			
Benzene	ND	---	0.0171	mg/kg dry	50	05/11/23 15:26	5035A/8260D		
Toluene	ND	---	0.0857	mg/kg dry	50	05/11/23 15:26	5035A/8260D		
Ethylbenzene	ND	---	0.0429	mg/kg dry	50	05/11/23 15:26	5035A/8260D		
Xylenes, total	0.153	---	0.129	mg/kg dry	50	05/11/23 15:26	5035A/8260D		
Naphthalene	ND	---	0.171	mg/kg dry	50	05/11/23 15:26	5035A/8260D		
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 107 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>		<i>05/11/23 15:26</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>95 %</i>		<i>80-120 %</i>		<i>1</i>		<i>05/11/23 15:26</i>	<i>5035A/8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>100 %</i>		<i>79-120 %</i>		<i>1</i>		<i>05/11/23 15:26</i>	<i>5035A/8260D</i>
TP4-9.0 (A3E1233-09)				Matrix: Soil		Batch: 23E0496			
Benzene	ND	---	0.0146	mg/kg dry	50	05/11/23 15:52	5035A/8260D		
Toluene	ND	---	0.0729	mg/kg dry	50	05/11/23 15:52	5035A/8260D		
Ethylbenzene	ND	---	0.0365	mg/kg dry	50	05/11/23 15:52	5035A/8260D		
Xylenes, total	ND	---	0.109	mg/kg dry	50	05/11/23 15:52	5035A/8260D		

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
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503-718-2323
ORELAP ID: OR100062

PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: <u>Aalsea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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ANALYTICAL SAMPLE RESULTS

BTEX+N Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
TP4-9.0 (A3E1233-09)				Matrix: Soil		Batch: 23E0496		
Naphthalene	ND	---	0.146	mg/kg dry	50	05/11/23 15:52	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>			<i>Recovery: 106 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>05/11/23 15:52</i>	<i>5035A/8260D</i>	
<i>Toluene-d8 (Surr)</i>			<i>94 %</i>	<i>80-120 %</i>	<i>1</i>	<i>05/11/23 15:52</i>	<i>5035A/8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>			<i>100 %</i>	<i>79-120 %</i>	<i>1</i>	<i>05/11/23 15:52</i>	<i>5035A/8260D</i>	
TP5-10.0 (A3E1233-11)				Matrix: Soil		Batch: 23E0496		
Benzene	ND	---	0.0171	mg/kg dry	50	05/11/23 16:17	5035A/8260D	
Toluene	ND	---	0.0853	mg/kg dry	50	05/11/23 16:17	5035A/8260D	
Ethylbenzene	ND	---	0.0427	mg/kg dry	50	05/11/23 16:17	5035A/8260D	
Xylenes, total	ND	---	0.128	mg/kg dry	50	05/11/23 16:17	5035A/8260D	
Naphthalene	ND	---	0.171	mg/kg dry	50	05/11/23 16:17	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>			<i>Recovery: 106 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>05/11/23 16:17</i>	<i>5035A/8260D</i>	
<i>Toluene-d8 (Surr)</i>			<i>96 %</i>	<i>80-120 %</i>	<i>1</i>	<i>05/11/23 16:17</i>	<i>5035A/8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>			<i>100 %</i>	<i>79-120 %</i>	<i>1</i>	<i>05/11/23 16:17</i>	<i>5035A/8260D</i>	
TP1-GW (A3E1233-12)				Matrix: Water		Batch: 23E0432		
Benzene	ND	---	0.200	ug/L	1	05/11/23 14:26	EPA 8260D	
Toluene	ND	---	1.00	ug/L	1	05/11/23 14:26	EPA 8260D	
Ethylbenzene	ND	---	0.500	ug/L	1	05/11/23 14:26	EPA 8260D	
Xylenes, total	ND	---	1.50	ug/L	1	05/11/23 14:26	EPA 8260D	
Naphthalene	ND	---	2.00	ug/L	1	05/11/23 14:26	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>			<i>Recovery: 97 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>05/11/23 14:26</i>	<i>EPA 8260D</i>	
<i>Toluene-d8 (Surr)</i>			<i>99 %</i>	<i>80-120 %</i>	<i>1</i>	<i>05/11/23 14:26</i>	<i>EPA 8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>			<i>106 %</i>	<i>80-120 %</i>	<i>1</i>	<i>05/11/23 14:26</i>	<i>EPA 8260D</i>	
TP6-10.0 (A3E1233-13)				Matrix: Soil		Batch: 23E0496		
Benzene	ND	---	0.0205	mg/kg dry	50	05/11/23 16:43	5035A/8260D	
Toluene	ND	---	0.102	mg/kg dry	50	05/11/23 16:43	5035A/8260D	
Ethylbenzene	ND	---	0.0512	mg/kg dry	50	05/11/23 16:43	5035A/8260D	
Xylenes, total	ND	---	0.154	mg/kg dry	50	05/11/23 16:43	5035A/8260D	
Naphthalene	1.84	---	0.205	mg/kg dry	50	05/11/23 16:43	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>			<i>Recovery: 106 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>05/11/23 16:43</i>	<i>5035A/8260D</i>	
<i>Toluene-d8 (Surr)</i>			<i>93 %</i>	<i>80-120 %</i>	<i>1</i>	<i>05/11/23 16:43</i>	<i>5035A/8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>			<i>98 %</i>	<i>79-120 %</i>	<i>1</i>	<i>05/11/23 16:43</i>	<i>5035A/8260D</i>	
TP7-1.0 (A3E1233-14)				Matrix: Soil		Batch: 23E0496		
Benzene	ND	---	0.0210	mg/kg dry	50	05/11/23 17:08	5035A/8260D	

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ANALYTICAL REPORT

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503-718-2323
ORELAP ID: OR100062

PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: Alsea Hwy Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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ANALYTICAL SAMPLE RESULTS

BTEX+N Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
TP7-1.0 (A3E1233-14)				Matrix: Soil		Batch: 23E0496		
Toluene	ND	---	0.105	mg/kg dry	50	05/11/23 17:08	5035A/8260D	
Ethylbenzene	ND	---	0.0524	mg/kg dry	50	05/11/23 17:08	5035A/8260D	
Xylenes, total	ND	---	0.157	mg/kg dry	50	05/11/23 17:08	5035A/8260D	
Naphthalene	ND	---	0.210	mg/kg dry	50	05/11/23 17:08	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 106 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>05/11/23 17:08</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>				<i>94 %</i>		<i>80-120 %</i>	<i>1</i>	<i>05/11/23 17:08</i>
<i>4-Bromofluorobenzene (Surr)</i>				<i>99 %</i>		<i>79-120 %</i>	<i>1</i>	<i>05/11/23 17:08</i>
TP7-10.0 (A3E1233-15)				Matrix: Soil		Batch: 23E0496		
Benzene	ND	---	0.0176	mg/kg dry	50	05/11/23 17:34	5035A/8260D	
Toluene	ND	---	0.0878	mg/kg dry	50	05/11/23 17:34	5035A/8260D	
Ethylbenzene	ND	---	0.0439	mg/kg dry	50	05/11/23 17:34	5035A/8260D	
Xylenes, total	ND	---	0.132	mg/kg dry	50	05/11/23 17:34	5035A/8260D	
Naphthalene	ND	---	0.176	mg/kg dry	50	05/11/23 17:34	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 105 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>05/11/23 17:34</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>				<i>94 %</i>		<i>80-120 %</i>	<i>1</i>	<i>05/11/23 17:34</i>
<i>4-Bromofluorobenzene (Surr)</i>				<i>100 %</i>		<i>79-120 %</i>	<i>1</i>	<i>05/11/23 17:34</i>
TP8-8.0 (A3E1233-16)				Matrix: Soil		Batch: 23E0496		
Benzene	ND	---	0.0173	mg/kg dry	50	05/11/23 18:00	5035A/8260D	
Toluene	ND	---	0.0863	mg/kg dry	50	05/11/23 18:00	5035A/8260D	
Ethylbenzene	ND	---	0.0431	mg/kg dry	50	05/11/23 18:00	5035A/8260D	
Xylenes, total	ND	---	0.129	mg/kg dry	50	05/11/23 18:00	5035A/8260D	
Naphthalene	ND	---	0.173	mg/kg dry	50	05/11/23 18:00	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 105 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>05/11/23 18:00</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>				<i>96 %</i>		<i>80-120 %</i>	<i>1</i>	<i>05/11/23 18:00</i>
<i>4-Bromofluorobenzene (Surr)</i>				<i>100 %</i>		<i>79-120 %</i>	<i>1</i>	<i>05/11/23 18:00</i>
TP9-8.0 (A3E1233-17)				Matrix: Soil		Batch: 23E0496		
Benzene	ND	---	0.0164	mg/kg dry	50	05/11/23 18:25	5035A/8260D	
Toluene	ND	---	0.0818	mg/kg dry	50	05/11/23 18:25	5035A/8260D	
Ethylbenzene	ND	---	0.0409	mg/kg dry	50	05/11/23 18:25	5035A/8260D	
Xylenes, total	ND	---	0.123	mg/kg dry	50	05/11/23 18:25	5035A/8260D	
Naphthalene	ND	---	0.327	mg/kg dry	50	05/11/23 18:25	5035A/8260D	R-02
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 106 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>05/11/23 18:25</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>				<i>95 %</i>		<i>80-120 %</i>	<i>1</i>	<i>05/11/23 18:25</i>
<i>4-Bromofluorobenzene (Surr)</i>				<i>98 %</i>		<i>79-120 %</i>	<i>1</i>	<i>05/11/23 18:25</i>

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: Alea Hwy Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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ANALYTICAL SAMPLE RESULTS

BTEX+N Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
TP10-8.0 (A3E1233-18)			Matrix: Soil		Batch: 23E0496			
Benzene	ND	---	0.0161	mg/kg dry	50	05/11/23 18:51	5035A/8260D	
Toluene	ND	---	0.0804	mg/kg dry	50	05/11/23 18:51	5035A/8260D	
Ethylbenzene	ND	---	0.0402	mg/kg dry	50	05/11/23 18:51	5035A/8260D	
Xylenes, total	ND	---	0.121	mg/kg dry	50	05/11/23 18:51	5035A/8260D	
Naphthalene	ND	---	0.161	mg/kg dry	50	05/11/23 18:51	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>			<i>Recovery: 105 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>05/11/23 18:51</i>	<i>5035A/8260D</i>	
<i>Toluene-d8 (Surr)</i>			<i>94 %</i>	<i>80-120 %</i>	<i>1</i>	<i>05/11/23 18:51</i>	<i>5035A/8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>			<i>100 %</i>	<i>79-120 %</i>	<i>1</i>	<i>05/11/23 18:51</i>	<i>5035A/8260D</i>	
TP11-8.0 (A3E1233-19)			Matrix: Soil		Batch: 23E0496			
Benzene	ND	---	0.0171	mg/kg dry	50	05/11/23 19:16	5035A/8260D	
Toluene	ND	---	0.0853	mg/kg dry	50	05/11/23 19:16	5035A/8260D	
Ethylbenzene	ND	---	0.0426	mg/kg dry	50	05/11/23 19:16	5035A/8260D	
Xylenes, total	ND	---	0.128	mg/kg dry	50	05/11/23 19:16	5035A/8260D	
Naphthalene	ND	---	0.171	mg/kg dry	50	05/11/23 19:16	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>			<i>Recovery: 104 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>05/11/23 19:16</i>	<i>5035A/8260D</i>	
<i>Toluene-d8 (Surr)</i>			<i>95 %</i>	<i>80-120 %</i>	<i>1</i>	<i>05/11/23 19:16</i>	<i>5035A/8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>			<i>100 %</i>	<i>79-120 %</i>	<i>1</i>	<i>05/11/23 19:16</i>	<i>5035A/8260D</i>	

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ANALYTICAL REPORT

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ORELAP ID: OR100062

PBS Engineering and Environmental	Project: Alea Hwy	
4412 S Corbett Ave	Project Number: 24422.000	Report ID:
Portland, OR 97239	Project Manager: Nick Thornton	A3E1233 - 05 24 23 1039

ANALYTICAL SAMPLE RESULTS

Selected Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
TP2-GW (A3E1233-10)				Matrix: Water		Batch: 23E0432		
Benzene	34.7	---	0.200	ug/L	1	05/11/23 14:04	EPA 8260D	
Toluene	ND	---	1.00	ug/L	1	05/11/23 14:04	EPA 8260D	
Ethylbenzene	10.4	---	0.500	ug/L	1	05/11/23 14:04	EPA 8260D	
Xylenes, total	23.0	---	1.50	ug/L	1	05/11/23 14:04	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND	---	1.00	ug/L	1	05/11/23 14:04	EPA 8260D	
Naphthalene	130	---	2.00	ug/L	1	05/11/23 14:04	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	05/11/23 14:04	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.500	ug/L	1	05/11/23 14:04	EPA 8260D	
Isopropylbenzene	11.2	---	1.00	ug/L	1	05/11/23 14:04	EPA 8260D	
1,2,4-Trimethylbenzene	21.5	---	1.00	ug/L	1	05/11/23 14:04	EPA 8260D	
1,3,5-Trimethylbenzene	3.97	---	1.00	ug/L	1	05/11/23 14:04	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>			<i>Recovery: 87 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>05/11/23 14:04</i>	<i>EPA 8260D</i>	
<i>Toluene-d8 (Surr)</i>			<i>98 %</i>	<i>80-120 %</i>	<i>1</i>	<i>05/11/23 14:04</i>	<i>EPA 8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>			<i>94 %</i>	<i>80-120 %</i>	<i>1</i>	<i>05/11/23 14:04</i>	<i>EPA 8260D</i>	
TP6-GW (A3E1233-20)				Matrix: Water		Batch: 23E0432		
Benzene	100	---	0.200	ug/L	1	05/11/23 14:48	EPA 8260D	
Toluene	3.66	---	1.00	ug/L	1	05/11/23 14:48	EPA 8260D	
Ethylbenzene	26.2	---	0.500	ug/L	1	05/11/23 14:48	EPA 8260D	
Xylenes, total	100	---	1.50	ug/L	1	05/11/23 14:48	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND	---	1.00	ug/L	1	05/11/23 14:48	EPA 8260D	
Naphthalene	37.8	---	2.00	ug/L	1	05/11/23 14:48	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	05/11/23 14:48	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.500	ug/L	1	05/11/23 14:48	EPA 8260D	
Isopropylbenzene	7.55	---	1.00	ug/L	1	05/11/23 14:48	EPA 8260D	
1,2,4-Trimethylbenzene	18.5	---	1.00	ug/L	1	05/11/23 14:48	EPA 8260D	
1,3,5-Trimethylbenzene	6.41	---	1.00	ug/L	1	05/11/23 14:48	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>			<i>Recovery: 98 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>05/11/23 14:48</i>	<i>EPA 8260D</i>	
<i>Toluene-d8 (Surr)</i>			<i>95 %</i>	<i>80-120 %</i>	<i>1</i>	<i>05/11/23 14:48</i>	<i>EPA 8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>			<i>101 %</i>	<i>80-120 %</i>	<i>1</i>	<i>05/11/23 14:48</i>	<i>EPA 8260D</i>	
TB20230508 (A3E1233-21)				Matrix: Water		Batch: 23E0559		
Benzene	ND	---	0.200	ug/L	1	05/12/23 15:59	EPA 8260D	
Toluene	ND	---	1.00	ug/L	1	05/12/23 15:59	EPA 8260D	
Ethylbenzene	ND	---	0.500	ug/L	1	05/12/23 15:59	EPA 8260D	
Xylenes, total	ND	---	1.50	ug/L	1	05/12/23 15:59	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND	---	1.00	ug/L	1	05/12/23 15:59	EPA 8260D	
Naphthalene	ND	---	2.00	ug/L	1	05/12/23 15:59	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	05/12/23 15:59	EPA 8260D	

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
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ORELAP ID: OR100062

<u>PBS Engineering and Environmental</u> 4412 S Corbett Ave Portland, OR 97239	Project: <u>Alesea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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ANALYTICAL SAMPLE RESULTS

Selected Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
TB20230508 (A3E1233-21)				Matrix: Water		Batch: 23E0559		
1,2-Dichloroethane (EDC)	ND	---	0.500	ug/L	1	05/12/23 15:59	EPA 8260D	
Isopropylbenzene	ND	---	1.00	ug/L	1	05/12/23 15:59	EPA 8260D	
1,2,4-Trimethylbenzene	ND	---	1.00	ug/L	1	05/12/23 15:59	EPA 8260D	
1,3,5-Trimethylbenzene	ND	---	1.00	ug/L	1	05/12/23 15:59	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 93 %</i>		<i>Limits: 80-120 %</i>		<i>05/12/23 15:59</i>	<i>EPA 8260D</i>	
<i>Toluene-d8 (Surr)</i>		<i>101 %</i>		<i>80-120 %</i>		<i>05/12/23 15:59</i>	<i>EPA 8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>		<i>101 %</i>		<i>80-120 %</i>		<i>05/12/23 15:59</i>	<i>EPA 8260D</i>	

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503-718-2323
ORELAP ID: OR100062

PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: Alea Hwy Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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ANALYTICAL SAMPLE RESULTS

Selected Volatile Organic Compounds by EPA 5035A/8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
TP2-5.0 (A3E1233-05)			Matrix: Soil		Batch: 23E0496			
Benzene	1.22	---	0.0690	mg/kg dry	200	05/11/23 22:15	5035A/8260D	
Toluene	ND	---	0.345	mg/kg dry	200	05/11/23 22:15	5035A/8260D	
Ethylbenzene	0.763	---	0.173	mg/kg dry	200	05/11/23 22:15	5035A/8260D	
Xylenes, total	ND	---	0.518	mg/kg dry	200	05/11/23 22:15	5035A/8260D	
Methyl tert-butyl ether (MTBE)	ND	---	0.345	mg/kg dry	200	05/11/23 22:15	5035A/8260D	
Naphthalene	35.1	---	0.690	mg/kg dry	200	05/11/23 22:15	5035A/8260D	
1,2-Dibromoethane (EDB)	ND	---	0.345	mg/kg dry	200	05/11/23 22:15	5035A/8260D	
1,2-Dichloroethane (EDC)	ND	---	0.173	mg/kg dry	200	05/11/23 22:15	5035A/8260D	
Isopropylbenzene	4.84	---	0.345	mg/kg dry	200	05/11/23 22:15	5035A/8260D	
1,2,4-Trimethylbenzene	6.65	---	0.345	mg/kg dry	200	05/11/23 22:15	5035A/8260D	
1,3,5-Trimethylbenzene	ND	---	0.345	mg/kg dry	200	05/11/23 22:15	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>			<i>Recovery: 105 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>05/11/23 22:15</i>	<i>5035A/8260D</i>	
<i>Toluene-d8 (Surr)</i>			<i>98 %</i>	<i>80-120 %</i>	<i>1</i>	<i>05/11/23 22:15</i>	<i>5035A/8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>			<i>101 %</i>	<i>79-120 %</i>	<i>1</i>	<i>05/11/23 22:15</i>	<i>5035A/8260D</i>	

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ANALYTICAL REPORT

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ORELAP ID: OR100062

PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: <u>Aalsea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Soil			Batch: 23E0848		
TP1-5.0 (A3E1233-03)								
Acenaphthene	ND	---	0.0410	mg/kg dry	3	05/19/23 23:08	EPA 8270E SIM	
Acenaphthylene	ND	---	0.0410	mg/kg dry	3	05/19/23 23:08	EPA 8270E SIM	
Anthracene	ND	---	0.0410	mg/kg dry	3	05/19/23 23:08	EPA 8270E SIM	
Benz(a)anthracene	ND	---	0.0574	mg/kg dry	3	05/19/23 23:08	EPA 8270E SIM	R-02
Benzo(a)pyrene	ND	---	0.0410	mg/kg dry	3	05/19/23 23:08	EPA 8270E SIM	
Benzo(b)fluoranthene	ND	---	0.0410	mg/kg dry	3	05/19/23 23:08	EPA 8270E SIM	
Benzo(k)fluoranthene	ND	---	0.0410	mg/kg dry	3	05/19/23 23:08	EPA 8270E SIM	
Benzo(g,h,i)perylene	0.0509	---	0.0410	mg/kg dry	3	05/19/23 23:08	EPA 8270E SIM	
Chrysene	ND	---	0.0615	mg/kg dry	3	05/19/23 23:08	EPA 8270E SIM	R-02
Dibenz(a,h)anthracene	ND	---	0.0410	mg/kg dry	3	05/19/23 23:08	EPA 8270E SIM	
Fluoranthene	ND	---	0.0410	mg/kg dry	3	05/19/23 23:08	EPA 8270E SIM	
Fluorene	ND	---	0.0410	mg/kg dry	3	05/19/23 23:08	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	0.0437	---	0.0410	mg/kg dry	3	05/19/23 23:08	EPA 8270E SIM	
1-Methylnaphthalene	0.0543	---	0.0410	mg/kg dry	3	05/19/23 23:08	EPA 8270E SIM	
2-Methylnaphthalene	0.0913	---	0.0410	mg/kg dry	3	05/19/23 23:08	EPA 8270E SIM	
Naphthalene	0.0491	---	0.0410	mg/kg dry	3	05/19/23 23:08	EPA 8270E SIM	
Phenanthrene	0.0680	---	0.0410	mg/kg dry	3	05/19/23 23:08	EPA 8270E SIM	
Pyrene	ND	---	0.0410	mg/kg dry	3	05/19/23 23:08	EPA 8270E SIM	
Dibenzofuran	ND	---	0.0410	mg/kg dry	3	05/19/23 23:08	EPA 8270E SIM	
<i>Surrogate: 2-Fluorobiphenyl (Surr)</i>			<i>Recovery: 90 %</i>	<i>Limits: 44-120 %</i>	3	05/19/23 23:08	EPA 8270E SIM	
<i>p-Terphenyl-d14 (Surr)</i>			<i>81 %</i>	<i>54-127 %</i>	3	05/19/23 23:08	EPA 8270E SIM	

			Matrix: Soil			Batch: 23E0848		
TP2-10.0 (A3E1233-06)								
Acenaphthene	ND	---	2.65	mg/kg dry	15	05/19/23 23:33	EPA 8270E SIM	R-02
Acenaphthylene	ND	---	0.822	mg/kg dry	15	05/19/23 23:33	EPA 8270E SIM	R-02
Anthracene	ND	---	1.02	mg/kg dry	15	05/19/23 23:33	EPA 8270E SIM	R-02
Benz(a)anthracene	ND	---	0.200	mg/kg dry	15	05/19/23 23:33	EPA 8270E SIM	
Benzo(a)pyrene	ND	---	0.200	mg/kg dry	15	05/19/23 23:33	EPA 8270E SIM	
Benzo(b)fluoranthene	ND	---	0.200	mg/kg dry	15	05/19/23 23:33	EPA 8270E SIM	
Benzo(k)fluoranthene	ND	---	0.200	mg/kg dry	15	05/19/23 23:33	EPA 8270E SIM	
Benzo(g,h,i)perylene	ND	---	0.200	mg/kg dry	15	05/19/23 23:33	EPA 8270E SIM	
Chrysene	ND	---	0.200	mg/kg dry	15	05/19/23 23:33	EPA 8270E SIM	
Dibenz(a,h)anthracene	ND	---	0.200	mg/kg dry	15	05/19/23 23:33	EPA 8270E SIM	
Fluoranthene	0.222	---	0.200	mg/kg dry	15	05/19/23 23:33	EPA 8270E SIM	
Fluorene	8.61	---	0.200	mg/kg dry	15	05/19/23 23:33	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	---	0.200	mg/kg dry	15	05/19/23 23:33	EPA 8270E SIM	
1-Methylnaphthalene	29.7	---	0.200	mg/kg dry	15	05/19/23 23:33	EPA 8270E SIM	
2-Methylnaphthalene	40.5	---	0.200	mg/kg dry	15	05/19/23 23:33	EPA 8270E SIM	
Naphthalene	12.7	---	0.200	mg/kg dry	15	05/19/23 23:33	EPA 8270E SIM	

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PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: <u>Aalsea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
TP2-10.0 (A3E1233-06)				Matrix: Soil		Batch: 23E0848		
Phenanthrene	13.4	---	0.200	mg/kg dry	15	05/19/23 23:33	EPA 8270E SIM	
Pyrene	0.651	---	0.200	mg/kg dry	15	05/19/23 23:33	EPA 8270E SIM	
Dibenzofuran	4.16	---	0.200	mg/kg dry	15	05/19/23 23:33	EPA 8270E SIM	
<i>Surrogate: 2-Fluorobiphenyl (Surr)</i>		<i>Recovery: 101 %</i>		<i>Limits: 44-120 %</i>		<i>15</i>	<i>05/19/23 23:33</i>	<i>EPA 8270E SIM</i>
<i>p-Terphenyl-d14 (Surr)</i>		<i>111 %</i>		<i>54-127 %</i>		<i>15</i>	<i>05/19/23 23:33</i>	<i>EPA 8270E SIM</i>
TP3-10.0 (A3E1233-08)				Matrix: Soil		Batch: 23E0848		
Acenaphthene	ND	---	0.0919	mg/kg dry	1	05/19/23 23:58	EPA 8270E SIM	R-02
Acenaphthylene	ND	---	0.0209	mg/kg dry	1	05/19/23 23:58	EPA 8270E SIM	R-02
Anthracene	ND	---	0.0515	mg/kg dry	1	05/19/23 23:58	EPA 8270E SIM	R-02
Benz(a)anthracene	ND	---	0.0139	mg/kg dry	1	05/19/23 23:58	EPA 8270E SIM	
Benzo(a)pyrene	ND	---	0.0139	mg/kg dry	1	05/19/23 23:58	EPA 8270E SIM	
Benzo(b)fluoranthene	ND	---	0.0139	mg/kg dry	1	05/19/23 23:58	EPA 8270E SIM	
Benzo(k)fluoranthene	ND	---	0.0139	mg/kg dry	1	05/19/23 23:58	EPA 8270E SIM	
Benzo(g,h,i)perylene	ND	---	0.0139	mg/kg dry	1	05/19/23 23:58	EPA 8270E SIM	
Chrysene	ND	---	0.0139	mg/kg dry	1	05/19/23 23:58	EPA 8270E SIM	
Dibenz(a,h)anthracene	ND	---	0.0139	mg/kg dry	1	05/19/23 23:58	EPA 8270E SIM	
Fluoranthene	0.0243	---	0.0139	mg/kg dry	1	05/19/23 23:58	EPA 8270E SIM	
Fluorene	0.195	---	0.0139	mg/kg dry	1	05/19/23 23:58	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	---	0.0139	mg/kg dry	1	05/19/23 23:58	EPA 8270E SIM	
1-Methylnaphthalene	0.263	---	0.0139	mg/kg dry	1	05/19/23 23:58	EPA 8270E SIM	
2-Methylnaphthalene	0.0168	---	0.0139	mg/kg dry	1	05/19/23 23:58	EPA 8270E SIM	
Naphthalene	0.0210	---	0.0139	mg/kg dry	1	05/19/23 23:58	EPA 8270E SIM	
Phenanthrene	0.480	---	0.0139	mg/kg dry	1	05/19/23 23:58	EPA 8270E SIM	
Pyrene	0.0504	---	0.0139	mg/kg dry	1	05/19/23 23:58	EPA 8270E SIM	
Dibenzofuran	0.0904	---	0.0139	mg/kg dry	1	05/19/23 23:58	EPA 8270E SIM	
<i>Surrogate: 2-Fluorobiphenyl (Surr)</i>		<i>Recovery: 89 %</i>		<i>Limits: 44-120 %</i>		<i>1</i>	<i>05/19/23 23:58</i>	<i>EPA 8270E SIM</i>
<i>p-Terphenyl-d14 (Surr)</i>		<i>81 %</i>		<i>54-127 %</i>		<i>1</i>	<i>05/19/23 23:58</i>	<i>EPA 8270E SIM</i>
TP6-10.0 (A3E1233-13)				Matrix: Soil		Batch: 23E0848		
Acenaphthene	ND	---	0.575	mg/kg dry	5	05/20/23 00:23	EPA 8270E SIM	R-02
Acenaphthylene	ND	---	0.136	mg/kg dry	5	05/20/23 00:23	EPA 8270E SIM	R-02
Anthracene	ND	---	0.144	mg/kg dry	5	05/20/23 00:23	EPA 8270E SIM	R-02
Benz(a)anthracene	ND	---	0.0757	mg/kg dry	5	05/20/23 00:23	EPA 8270E SIM	
Benzo(a)pyrene	ND	---	0.0757	mg/kg dry	5	05/20/23 00:23	EPA 8270E SIM	
Benzo(b)fluoranthene	ND	---	0.0757	mg/kg dry	5	05/20/23 00:23	EPA 8270E SIM	
Benzo(k)fluoranthene	ND	---	0.0757	mg/kg dry	5	05/20/23 00:23	EPA 8270E SIM	
Benzo(g,h,i)perylene	ND	---	0.0757	mg/kg dry	5	05/20/23 00:23	EPA 8270E SIM	

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ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
TP6-10.0 (A3E1233-13)				Matrix: Soil		Batch: 23E0848		
Chrysene	ND	---	0.0757	mg/kg dry	5	05/20/23 00:23	EPA 8270E SIM	
Dibenz(a,h)anthracene	ND	---	0.0757	mg/kg dry	5	05/20/23 00:23	EPA 8270E SIM	
Fluoranthene	ND	---	0.0757	mg/kg dry	5	05/20/23 00:23	EPA 8270E SIM	
Fluorene	1.32	---	0.0757	mg/kg dry	5	05/20/23 00:23	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	---	0.0757	mg/kg dry	5	05/20/23 00:23	EPA 8270E SIM	
1-Methylnaphthalene	5.24	---	0.0757	mg/kg dry	5	05/20/23 00:23	EPA 8270E SIM	
2-Methylnaphthalene	7.14	---	0.0757	mg/kg dry	5	05/20/23 00:23	EPA 8270E SIM	
Naphthalene	1.38	---	0.0757	mg/kg dry	5	05/20/23 00:23	EPA 8270E SIM	
Phenanthrene	0.995	---	0.0757	mg/kg dry	5	05/20/23 00:23	EPA 8270E SIM	
Pyrene	0.100	---	0.0757	mg/kg dry	5	05/20/23 00:23	EPA 8270E SIM	
Dibenzofuran	0.468	---	0.0757	mg/kg dry	5	05/20/23 00:23	EPA 8270E SIM	
<i>Surrogate: 2-Fluorobiphenyl (Surr)</i>			<i>Recovery: 98 %</i>	<i>Limits: 44-120 %</i>	5	05/20/23 00:23	EPA 8270E SIM	
<i>p-Terphenyl-d14 (Surr)</i>			<i>112 %</i>	<i>54-127 %</i>	5	05/20/23 00:23	EPA 8270E SIM	

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ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW4 (A3E1233-01)				Matrix: Water		Batch: 23E0517		
Acenaphthene	ND	---	0.0321	ug/L	1	05/19/23 10:09	EPA 8270E LVI	
Acenaphthylene	ND	---	0.0321	ug/L	1	05/19/23 10:09	EPA 8270E LVI	
Anthracene	ND	---	0.0321	ug/L	1	05/19/23 10:09	EPA 8270E LVI	
Benz(a)anthracene	ND	---	0.0160	ug/L	1	05/19/23 10:09	EPA 8270E LVI	
Benzo(a)pyrene	ND	---	0.0160	ug/L	1	05/19/23 10:09	EPA 8270E LVI	
Benzo(b)fluoranthene	0.0168	---	0.0160	ug/L	1	05/19/23 10:09	EPA 8270E LVI	
Benzo(k)fluoranthene	ND	---	0.0160	ug/L	1	05/19/23 10:09	EPA 8270E LVI	
Benzo(g,h,i)perylene	ND	---	0.0321	ug/L	1	05/19/23 10:09	EPA 8270E LVI	
Chrysene	ND	---	0.0160	ug/L	1	05/19/23 10:09	EPA 8270E LVI	
Dibenz(a,h)anthracene	ND	---	0.0160	ug/L	1	05/19/23 10:09	EPA 8270E LVI	
Fluoranthene	ND	---	0.0321	ug/L	1	05/19/23 10:09	EPA 8270E LVI	
Fluorene	0.139	---	0.0321	ug/L	1	05/19/23 10:09	EPA 8270E LVI	
Indeno(1,2,3-cd)pyrene	ND	---	0.0160	ug/L	1	05/19/23 10:09	EPA 8270E LVI	
1-Methylnaphthalene	ND	---	0.0641	ug/L	1	05/19/23 10:09	EPA 8270E LVI	
2-Methylnaphthalene	ND	---	0.0641	ug/L	1	05/19/23 10:09	EPA 8270E LVI	
Naphthalene	0.108	---	0.0641	ug/L	1	05/19/23 10:09	EPA 8270E LVI	
Phenanthrene	ND	---	0.0641	ug/L	1	05/19/23 10:09	EPA 8270E LVI	
Pyrene	ND	---	0.0321	ug/L	1	05/19/23 10:09	EPA 8270E LVI	
Carbazole	0.0593	---	0.0321	ug/L	1	05/19/23 10:09	EPA 8270E LVI	
Dibenzofuran	0.101	---	0.0321	ug/L	1	05/19/23 10:09	EPA 8270E LVI	
<i>Surrogate: Acenaphthylene-d8 (Surr)</i>		<i>Recovery: 117 %</i>		<i>Limits: 78-134 %</i>		<i>1</i>	<i>05/19/23 10:09</i>	<i>EPA 8270E LVI</i>
<i>Benzo(a)pyrene-d12 (Surr)</i>		<i>102 %</i>		<i>80-132 %</i>		<i>1</i>	<i>05/19/23 10:09</i>	<i>EPA 8270E LVI</i>

TP2-GW (A3E1233-10)				Matrix: Water		Batch: 23E0517		
Acenaphthene	ND	---	2.64	ug/L	20	05/19/23 10:42	EPA 8270E LVI	R-02
Acenaphthylene	ND	---	1.10	ug/L	20	05/19/23 10:42	EPA 8270E LVI	R-02
Anthracene	ND	---	0.704	ug/L	20	05/19/23 10:42	EPA 8270E LVI	
Benz(a)anthracene	ND	---	0.352	ug/L	20	05/19/23 10:42	EPA 8270E LVI	
Benzo(a)pyrene	ND	---	0.352	ug/L	20	05/19/23 10:42	EPA 8270E LVI	
Benzo(b)fluoranthene	ND	---	0.352	ug/L	20	05/19/23 10:42	EPA 8270E LVI	
Benzo(k)fluoranthene	ND	---	0.352	ug/L	20	05/19/23 10:42	EPA 8270E LVI	
Benzo(g,h,i)perylene	ND	---	0.704	ug/L	20	05/19/23 10:42	EPA 8270E LVI	
Chrysene	ND	---	0.352	ug/L	20	05/19/23 10:42	EPA 8270E LVI	
Dibenz(a,h)anthracene	ND	---	0.352	ug/L	20	05/19/23 10:42	EPA 8270E LVI	
Fluoranthene	ND	---	0.704	ug/L	20	05/19/23 10:42	EPA 8270E LVI	
Fluorene	7.57	---	0.704	ug/L	20	05/19/23 10:42	EPA 8270E LVI	
Indeno(1,2,3-cd)pyrene	ND	---	0.352	ug/L	20	05/19/23 10:42	EPA 8270E LVI	
1-Methylnaphthalene	62.3	---	1.41	ug/L	20	05/19/23 10:42	EPA 8270E LVI	
2-Methylnaphthalene	75.2	---	1.41	ug/L	20	05/19/23 10:42	EPA 8270E LVI	

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PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: <u>Alsa Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
TP2-GW (A3E1233-10)			Matrix: Water			Batch: 23E0517		
Naphthalene	92.7	---	1.41	ug/L	20	05/19/23 10:42	EPA 8270E LVI	
Phenanthrene	7.84	---	1.41	ug/L	20	05/19/23 10:42	EPA 8270E LVI	
Pyrene	ND	---	0.704	ug/L	20	05/19/23 10:42	EPA 8270E LVI	
Carbazole	3.42	---	0.704	ug/L	20	05/19/23 10:42	EPA 8270E LVI	
Dibenzofuran	5.42	---	0.704	ug/L	20	05/19/23 10:42	EPA 8270E LVI	
<i>Surrogate: Acenaphthylene-d8 (Surr)</i>			<i>Recovery: 115 %</i>	<i>Limits: 78-134 %</i>	<i>20</i>	<i>05/19/23 10:42</i>	<i>EPA 8270E LVI</i>	<i>S-05</i>
<i>Benzo(a)pyrene-d12 (Surr)</i>			<i>96 %</i>	<i>80-132 %</i>	<i>20</i>	<i>05/19/23 10:42</i>	<i>EPA 8270E LVI</i>	<i>S-05</i>
TP6-GW (A3E1233-20)			Matrix: Water			Batch: 23E0517		
Acenaphthene	ND	---	2.41	ug/L	4	05/19/23 11:15	EPA 8270E LVI	R-02
Acenaphthylene	ND	---	0.637	ug/L	4	05/19/23 11:15	EPA 8270E LVI	R-02
Anthracene	ND	---	0.273	ug/L	4	05/19/23 11:15	EPA 8270E LVI	R-02
Benz(a)anthracene	ND	---	0.0728	ug/L	4	05/19/23 11:15	EPA 8270E LVI	
Benzo(a)pyrene	ND	---	0.0728	ug/L	4	05/19/23 11:15	EPA 8270E LVI	
Benzo(b)fluoranthene	ND	---	0.0728	ug/L	4	05/19/23 11:15	EPA 8270E LVI	
Benzo(k)fluoranthene	ND	---	0.0728	ug/L	4	05/19/23 11:15	EPA 8270E LVI	
Benzo(g,h,i)perylene	ND	---	0.146	ug/L	4	05/19/23 11:15	EPA 8270E LVI	
Chrysene	ND	---	0.0728	ug/L	4	05/19/23 11:15	EPA 8270E LVI	
Dibenz(a,h)anthracene	ND	---	0.0728	ug/L	4	05/19/23 11:15	EPA 8270E LVI	
Fluoranthene	ND	---	0.146	ug/L	4	05/19/23 11:15	EPA 8270E LVI	
Fluorene	4.94	---	0.146	ug/L	4	05/19/23 11:15	EPA 8270E LVI	
Indeno(1,2,3-cd)pyrene	ND	---	0.0728	ug/L	4	05/19/23 11:15	EPA 8270E LVI	
1-Methylnaphthalene	41.0	---	0.291	ug/L	4	05/19/23 11:15	EPA 8270E LVI	
2-Methylnaphthalene	58.7	---	0.291	ug/L	4	05/19/23 11:15	EPA 8270E LVI	
Naphthalene	29.3	---	0.291	ug/L	4	05/19/23 11:15	EPA 8270E LVI	
Phenanthrene	2.53	---	0.291	ug/L	4	05/19/23 11:15	EPA 8270E LVI	
Pyrene	0.186	---	0.146	ug/L	4	05/19/23 11:15	EPA 8270E LVI	
Carbazole	0.895	---	0.146	ug/L	4	05/19/23 11:15	EPA 8270E LVI	
Dibenzofuran	2.08	---	0.146	ug/L	4	05/19/23 11:15	EPA 8270E LVI	
<i>Surrogate: Acenaphthylene-d8 (Surr)</i>			<i>Recovery: 106 %</i>	<i>Limits: 78-134 %</i>	<i>4</i>	<i>05/19/23 11:15</i>	<i>EPA 8270E LVI</i>	<i>S-05</i>
<i>Benzo(a)pyrene-d12 (Surr)</i>			<i>97 %</i>	<i>80-132 %</i>	<i>4</i>	<i>05/19/23 11:15</i>	<i>EPA 8270E LVI</i>	<i>S-05</i>

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ANALYTICAL REPORT

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Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: <u>Aalsea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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ANALYTICAL SAMPLE RESULTS

Percent Dry Weight									
Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes	
TP1-5.0 (A3E1233-03)				Matrix: Soil		Batch: 23E0502			
% Solids	71.0	---	1.00	%	1	05/12/23 05:47	EPA 8000D	Q-42	
TP1-10.0 (A3E1233-04)				Matrix: Soil		Batch: 23E0502			
% Solids	67.2	---	1.00	%	1	05/12/23 05:47	EPA 8000D		
TP2-5.0 (A3E1233-05)				Matrix: Soil		Batch: 23E0502			
% Solids	70.0	---	1.00	%	1	05/12/23 05:47	EPA 8000D		
TP2-10.0 (A3E1233-06)				Matrix: Soil		Batch: 23E0502			
% Solids	70.4	---	1.00	%	1	05/12/23 05:47	EPA 8000D		
TP3-6.0 (A3E1233-07)				Matrix: Soil		Batch: 23E0502			
% Solids	68.6	---	1.00	%	1	05/12/23 05:47	EPA 8000D		
TP3-10.0 (A3E1233-08)				Matrix: Soil		Batch: 23E0502			
% Solids	69.1	---	1.00	%	1	05/12/23 05:47	EPA 8000D		
TP4-9.0 (A3E1233-09)				Matrix: Soil		Batch: 23E0502			
% Solids	73.8	---	1.00	%	1	05/12/23 05:47	EPA 8000D		
TP5-10.0 (A3E1233-11)				Matrix: Soil		Batch: 23E0502			
% Solids	68.0	---	1.00	%	1	05/12/23 05:47	EPA 8000D		
TP6-10.0 (A3E1233-13)				Matrix: Soil		Batch: 23E0502			
% Solids	64.0	---	1.00	%	1	05/12/23 05:47	EPA 8000D		
TP7-1.0 (A3E1233-14)				Matrix: Soil		Batch: 23E0502			
% Solids	68.9	---	1.00	%	1	05/12/23 05:47	EPA 8000D		
TP7-10.0 (A3E1233-15)				Matrix: Soil		Batch: 23E0502			
% Solids	69.2	---	1.00	%	1	05/12/23 05:47	EPA 8000D		
TP8-8.0 (A3E1233-16)				Matrix: Soil		Batch: 23E0502			
% Solids	69.9	---	1.00	%	1	05/12/23 05:47	EPA 8000D		
TP9-8.0 (A3E1233-17)				Matrix: Soil		Batch: 23E0502			
% Solids	69.8	---	1.00	%	1	05/12/23 05:47	EPA 8000D		

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<u>PBS Engineering and Environmental</u> 4412 S Corbett Ave Portland, OR 97239	Project: <u>Alesea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
TP10-8.0 (A3E1233-18)				Matrix: Soil		Batch: 23E0502		
% Solids	72.3	---	1.00	%	1	05/12/23 05:47	EPA 8000D	
TP11-8.0 (A3E1233-19)				Matrix: Soil		Batch: 23E0502		
% Solids	69.7	---	1.00	%	1	05/12/23 05:47	EPA 8000D	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-----------------	-------	----------	--------------	---------------	-------	--------------	-----	-----------	-------

Batch 23E0662 - EPA 3546 (Fuels) Soil

Blank (23E0662-BLK1)		Prepared: 05/16/23 07:26 Analyzed: 05/16/23 17:23										
NWTPH-Dx												
Diesel	ND	---	20.0	mg/kg wet	1	---	---	---	---	---	---	---
Oil	ND	---	40.0	mg/kg wet	1	---	---	---	---	---	---	---
<i>Surr: o-Terphenyl (Surr)</i>		<i>Recovery: 108 %</i>			<i>Limits: 50-150 %</i>		<i>Dilution: 1x</i>					

LCS (23E0662-BS1) Prepared: 05/16/23 07:26 Analyzed: 05/16/23 17:43

NWTPH-Dx												
Diesel	131	---	20.0	mg/kg wet	1	125	---	105	38 - 132%	---	---	
<i>Surr: o-Terphenyl (Surr)</i>		<i>Recovery: 111 %</i>			<i>Limits: 50-150 %</i>		<i>Dilution: 1x</i>					

Duplicate (23E0662-DUP1) Prepared: 05/16/23 07:26 Analyzed: 05/16/23 18:25

QC Source Sample: TP1-5.0 (A3E1233-03)												
NWTPH-Dx												
Diesel	1490	---	27.7	mg/kg dry	1	---	1280	---	---	15	30%	F-11, F-15
Oil	1160	---	55.4	mg/kg dry	1	---	1250	---	---	8	30%	F-03, F-16
<i>Surr: o-Terphenyl (Surr)</i>		<i>Recovery: 98 %</i>			<i>Limits: 50-150 %</i>		<i>Dilution: 1x</i>					

Batch 23E0689 - EPA 3510C (Fuels/Acid Ext.) Water

Blank (23E0689-BLK1)		Prepared: 05/16/23 11:18 Analyzed: 05/16/23 22:00										
NWTPH-Dx												
Diesel	ND	---	200	ug/L	1	---	---	---	---	---	---	---
Oil	ND	---	400	ug/L	1	---	---	---	---	---	---	---
<i>Surr: o-Terphenyl (Surr)</i>		<i>Recovery: 98 %</i>			<i>Limits: 50-150 %</i>		<i>Dilution: 1x</i>					

LCS (23E0689-BS1) Prepared: 05/16/23 11:18 Analyzed: 05/16/23 22:21

NWTPH-Dx												
Diesel	1010	---	200	ug/L	1	1250	---	81	36 - 132%	---	---	
<i>Surr: o-Terphenyl (Surr)</i>		<i>Recovery: 104 %</i>			<i>Limits: 50-150 %</i>		<i>Dilution: 1x</i>					

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QUALITY CONTROL (QC) SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23E0432 - EPA 5030C						Water						
Blank (23E0432-BLK1)		Prepared: 05/11/23 09:00 Analyzed: 05/11/23 12:34										
<u>NWTPH-Gx (MS)</u>												
Gasoline Range Organics	ND	---	100	ug/L	1	---	---	---	---	---	---	
<i>Surr: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 92 %</i>		<i>Limits: 50-150 %</i>		<i>Dilution: 1x</i>						
<i>1,4-Difluorobenzene (Sur)</i>		<i>102 %</i>		<i>50-150 %</i>		"						
LCS (23E0432-BS2)		Prepared: 05/11/23 09:00 Analyzed: 05/11/23 12:04										
<u>NWTPH-Gx (MS)</u>												
Gasoline Range Organics	538	---	100	ug/L	1	500	---	108	80 - 120%	---	---	
<i>Surr: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 95 %</i>		<i>Limits: 50-150 %</i>		<i>Dilution: 1x</i>						
<i>1,4-Difluorobenzene (Sur)</i>		<i>98 %</i>		<i>50-150 %</i>		"						
Duplicate (23E0432-DUP1)		Prepared: 05/11/23 11:51 Analyzed: 05/11/23 13:19										
<u>QC Source Sample: MW4 (A3E1233-01)</u>												
<u>NWTPH-Gx (MS)</u>												
Gasoline Range Organics	ND	---	100	ug/L	1	---	ND	---	---	---	30%	
<i>Surr: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 90 %</i>		<i>Limits: 50-150 %</i>		<i>Dilution: 1x</i>						
<i>1,4-Difluorobenzene (Sur)</i>		<i>102 %</i>		<i>50-150 %</i>		"						

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QUALITY CONTROL (QC) SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23E0496 - EPA 5035A						Soil						
Blank (23E0496-BLK1)		Prepared: 05/11/23 08:35 Analyzed: 05/11/23 12:03										
<u>NWTPH-Gx (MS)</u>												
Gasoline Range Organics	ND	---	5.00	mg/kg wet	50	---	---	---	---	---	---	
<i>Surr: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 104 %</i>		<i>Limits: 50-150 %</i>		<i>Dilution: 1x</i>						
<i>1,4-Difluorobenzene (Sur)</i>		<i>104 %</i>		<i>50-150 %</i>		<i>"</i>						
LCS (23E0496-BS2)		Prepared: 05/11/23 08:35 Analyzed: 05/11/23 11:24										
<u>NWTPH-Gx (MS)</u>												
Gasoline Range Organics	26.1	---	5.00	mg/kg wet	50	25.0	---	104	80 - 120%	---	---	
<i>Surr: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 103 %</i>		<i>Limits: 50-150 %</i>		<i>Dilution: 1x</i>						
<i>1,4-Difluorobenzene (Sur)</i>		<i>104 %</i>		<i>50-150 %</i>		<i>"</i>						
Duplicate (23E0496-DUP2)		Prepared: 05/08/23 13:30 Analyzed: 05/11/23 14:10										
<u>QC Source Sample: TP1-5.0 (A3E1233-03)</u>												
<u>NWTPH-Gx (MS)</u>												
Gasoline Range Organics	24.0	---	8.85	mg/kg dry	50	---	27.3	---	---	13	30%	
<i>Surr: 4-Bromofluorobenzene (Sur)</i>		<i>Recovery: 113 %</i>		<i>Limits: 50-150 %</i>		<i>Dilution: 1x</i>						
<i>1,4-Difluorobenzene (Sur)</i>		<i>103 %</i>		<i>50-150 %</i>		<i>"</i>						

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PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: <u>Alesea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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QUALITY CONTROL (QC) SAMPLE RESULTS

BTEX+N Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23E0432 - EPA 5030C						Water						
Blank (23E0432-BLK1)		Prepared: 05/11/23 09:00		Analyzed: 05/11/23 12:34								
EPA 8260D												
Benzene	ND	---	0.200	ug/L	1	---	---	---	---	---	---	---
Toluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
Ethylbenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	---
Xylenes, total	ND	---	1.50	ug/L	1	---	---	---	---	---	---	---
Naphthalene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	---
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 90 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>106 %</i>		<i>80-120 %</i>		<i>"</i>						
LCS (23E0432-BS1)						Prepared: 05/11/23 09:00 Analyzed: 05/11/23 11:18						
EPA 8260D												
Benzene	17.2	---	0.200	ug/L	1	20.0	---	86	80 - 120%	---	---	---
Toluene	18.5	---	1.00	ug/L	1	20.0	---	93	80 - 120%	---	---	---
Ethylbenzene	21.0	---	0.500	ug/L	1	20.0	---	105	80 - 120%	---	---	---
Xylenes, total	67.6	---	1.50	ug/L	1	60.0	---	113	80 - 120%	---	---	---
Naphthalene	17.1	---	2.00	ug/L	1	20.0	---	86	80 - 120%	---	---	---
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 89 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>92 %</i>		<i>80-120 %</i>		<i>"</i>						
Duplicate (23E0432-DUP1)						Prepared: 05/11/23 11:51 Analyzed: 05/11/23 13:19						
QC Source Sample: MW4 (A3E1233-01)												
EPA 8260D												
Benzene	ND	---	0.200	ug/L	1	---	ND	---	---	---	---	30%
Toluene	ND	---	1.00	ug/L	1	---	ND	---	---	---	---	30%
Ethylbenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	---	30%
Xylenes, total	ND	---	1.50	ug/L	1	---	ND	---	---	---	---	30%
Naphthalene	ND	---	2.00	ug/L	1	---	ND	---	---	---	---	30%
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 90 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>101 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>		<i>"</i>						

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QUALITY CONTROL (QC) SAMPLE RESULTS

BTEX+N Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23E0496 - EPA 5035A						Soil						
Blank (23E0496-BLK1)		Prepared: 05/11/23 08:35		Analyzed: 05/11/23 12:03								
<u>5035A/8260D</u>												
Benzene	ND	---	0.0100	mg/kg wet	50	---	---	---	---	---	---	---
Toluene	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	---
Ethylbenzene	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	---
Xylenes, total	ND	---	0.0750	mg/kg wet	50	---	---	---	---	---	---	---
Naphthalene	ND	---	0.100	mg/kg wet	50	---	---	---	---	---	---	---
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 104 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>97 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>99 %</i>		<i>79-120 %</i>		<i>"</i>						
<hr/>												
LCS (23E0496-BS1)		Prepared: 05/11/23 08:35		Analyzed: 05/11/23 10:58								
<u>5035A/8260D</u>												
Benzene	0.951	---	0.0100	mg/kg wet	50	1.00	---	95	80 - 120%	---	---	---
Toluene	0.888	---	0.0500	mg/kg wet	50	1.00	---	89	80 - 120%	---	---	---
Ethylbenzene	0.914	---	0.0250	mg/kg wet	50	1.00	---	91	80 - 120%	---	---	---
Xylenes, total	2.77	---	0.0750	mg/kg wet	50	3.00	---	92	80 - 120%	---	---	---
Naphthalene	0.835	---	0.100	mg/kg wet	50	1.00	---	83	80 - 120%	---	---	---
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 104 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>96 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>79-120 %</i>		<i>"</i>						
<hr/>												
Duplicate (23E0496-DUP2)		Prepared: 05/08/23 13:30		Analyzed: 05/11/23 14:10								
<u>QC Source Sample: TP1-5.0 (A3E1233-03)</u>												
<u>5035A/8260D</u>												
Benzene	ND	---	0.0177	mg/kg dry	50	---	0.0150	---	---	***	30%	---
Toluene	ND	---	0.0885	mg/kg dry	50	---	ND	---	---	---	30%	---
Ethylbenzene	ND	---	0.0442	mg/kg dry	50	---	ND	---	---	---	30%	---
Xylenes, total	ND	---	0.133	mg/kg dry	50	---	ND	---	---	---	30%	---
Naphthalene	ND	---	0.177	mg/kg dry	50	---	ND	---	---	---	30%	---
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 106 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>93 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>99 %</i>		<i>79-120 %</i>		<i>"</i>						

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Jason Woodcock, Project Manager



ANALYTICAL REPORT

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6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: Alesea Hwy Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
--	---	--

QUALITY CONTROL (QC) SAMPLE RESULTS

BTEX+N Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23E0496 - EPA 5035A						Soil						
Matrix Spike (23E0496-MS1)		Prepared: 05/09/23 15:15 Analyzed: 05/11/23 19:42										
QC Source Sample: TP11-8.0 (A3E1233-19)												
5035A/8260D												
Benzene	1.78	---	0.0171	mg/kg dry	50	1.71	ND	104	77 - 121%	---	---	
Toluene	1.66	---	0.0853	mg/kg dry	50	1.71	ND	97	77 - 121%	---	---	
Ethylbenzene	1.69	---	0.0426	mg/kg dry	50	1.71	ND	99	76 - 122%	---	---	
Xylenes, total	5.08	---	0.128	mg/kg dry	50	5.12	ND	99	78 - 124%	---	---	
Naphthalene	1.55	---	0.171	mg/kg dry	50	1.71	ND	91	62 - 129%	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 106 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>97 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>99 %</i>		<i>79-120 %</i>		<i>"</i>						

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PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: <u>Alea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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QUALITY CONTROL (QC) SAMPLE RESULTS

Selected Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23E0432 - EPA 5030C						Water						
Blank (23E0432-BLK1)		Prepared: 05/11/23 09:00		Analyzed: 05/11/23 12:34								
<u>EPA 8260D</u>												
Benzene	ND	---	0.200	ug/L	1	---	---	---	---	---	---	---
Toluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
Ethylbenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	---
Xylenes, total	ND	---	1.50	ug/L	1	---	---	---	---	---	---	---
Methyl tert-butyl ether (MTBE)	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
Naphthalene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	---
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 90 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>106 %</i>		<i>80-120 %</i>		<i>"</i>						
LCS (23E0432-BS1)						Prepared: 05/11/23 09:00 Analyzed: 05/11/23 11:18						
<u>EPA 8260D</u>												
Benzene	17.2	---	0.200	ug/L	1	20.0	---	86	80 - 120%	---	---	---
Toluene	18.5	---	1.00	ug/L	1	20.0	---	93	80 - 120%	---	---	---
Ethylbenzene	21.0	---	0.500	ug/L	1	20.0	---	105	80 - 120%	---	---	---
Xylenes, total	67.6	---	1.50	ug/L	1	60.0	---	113	80 - 120%	---	---	---
Methyl tert-butyl ether (MTBE)	19.0	---	1.00	ug/L	1	20.0	---	95	80 - 120%	---	---	---
Naphthalene	17.1	---	2.00	ug/L	1	20.0	---	86	80 - 120%	---	---	---
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 89 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>92 %</i>		<i>80-120 %</i>		<i>"</i>						
Duplicate (23E0432-DUP1)						Prepared: 05/11/23 11:51 Analyzed: 05/11/23 13:19						
<u>QC Source Sample: MW4 (A3E1233-01)</u>												
<u>EPA 8260D</u>												
Benzene	ND	---	0.200	ug/L	1	---	ND	---	---	---	---	30%
Toluene	ND	---	1.00	ug/L	1	---	ND	---	---	---	---	30%
Ethylbenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	---	30%
Xylenes, total	ND	---	1.50	ug/L	1	---	ND	---	---	---	---	30%
Methyl tert-butyl ether (MTBE)	ND	---	1.00	ug/L	1	---	ND	---	---	---	---	30%
Naphthalene	ND	---	2.00	ug/L	1	---	ND	---	---	---	---	30%
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 90 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>101 %</i>		<i>80-120 %</i>		<i>"</i>						

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ORELAP ID: OR100062

<u>PBS Engineering and Environmental</u> 4412 S Corbett Ave Portland, OR 97239	Project: <u>Alea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Selected Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC % REC	% REC Limits	RPD RPD	RPD Limit	Notes
Batch 23E0432 - EPA 5030C						Water						
Duplicate (23E0432-DUP1)		Prepared: 05/11/23 11:51 Analyzed: 05/11/23 13:19										
QC Source Sample: MW4 (A3E1233-01)												
<i>Surr: 4-Bromofluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>			<i>Limits: 80-120 %</i>			<i>Dilution: 1x</i>				

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<u>PBS Engineering and Environmental</u> 4412 S Corbett Ave Portland, OR 97239	Project: <u>Alsa Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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QUALITY CONTROL (QC) SAMPLE RESULTS

Selected Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC % REC	% REC Limits	RPD RPD	RPD Limit	Notes
Batch 23E0559 - EPA 5030C						Water						
Blank (23E0559-BLK1)		Prepared: 05/12/23 09:13			Analyzed: 05/12/23 11:06							
EPA 8260D												
Benzene	ND	---	0.200	ug/L	1	---	---	---	---	---	---	---
Toluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
Ethylbenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	---
Xylenes, total	ND	---	1.50	ug/L	1	---	---	---	---	---	---	---
Methyl tert-butyl ether (MTBE)	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
Naphthalene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	---
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	---	---	---	---	---	---	---
1,2-Dichloroethane (EDC)	ND	---	0.500	ug/L	1	---	---	---	---	---	---	---
Isopropylbenzene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
1,2,4-Trimethylbenzene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
1,3,5-Trimethylbenzene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 95 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>104 %</i>		<i>80-120 %</i>		<i>"</i>						

LCS (23E0559-BS1)						Prepared: 05/12/23 09:13 Analyzed: 05/12/23 10:15						
EPA 8260D												
Benzene	17.2	---	0.200	ug/L	1	20.0	---	86	80 - 120%	---	---	---
Toluene	18.3	---	1.00	ug/L	1	20.0	---	91	80 - 120%	---	---	---
Ethylbenzene	20.4	---	0.500	ug/L	1	20.0	---	102	80 - 120%	---	---	---
Xylenes, total	63.7	---	1.50	ug/L	1	60.0	---	106	80 - 120%	---	---	---
Methyl tert-butyl ether (MTBE)	19.2	---	1.00	ug/L	1	20.0	---	96	80 - 120%	---	---	---
Naphthalene	16.2	---	2.00	ug/L	1	20.0	---	81	80 - 120%	---	---	---
1,2-Dibromoethane (EDB)	19.8	---	0.500	ug/L	1	20.0	---	99	80 - 120%	---	---	---
1,2-Dichloroethane (EDC)	20.7	---	0.500	ug/L	1	20.0	---	103	80 - 120%	---	---	---
Isopropylbenzene	22.1	---	1.00	ug/L	1	20.0	---	110	80 - 120%	---	---	---
1,2,4-Trimethylbenzene	20.7	---	1.00	ug/L	1	20.0	---	103	80 - 120%	---	---	---
1,3,5-Trimethylbenzene	20.2	---	1.00	ug/L	1	20.0	---	101	80 - 120%	---	---	---
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 94 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>92 %</i>		<i>80-120 %</i>		<i>"</i>						

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Jason Woodcock, Project Manager



ANALYTICAL REPORT

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503-718-2323
ORELAP ID: OR100062

PBS Engineering and Environmental	Project: Alsea Hwy	
4412 S Corbett Ave	Project Number: 24422.000	Report ID:
Portland, OR 97239	Project Manager: Nick Thornton	A3E1233 - 05 24 23 1039

QUALITY CONTROL (QC) SAMPLE RESULTS

Selected Volatile Organic Compounds by EPA 5035A/8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23E0496 - EPA 5035A						Soil						
Blank (23E0496-BLK1)		Prepared: 05/11/23 08:35 Analyzed: 05/11/23 12:03										
5035A/8260D												
Benzene	ND	---	0.0100	mg/kg wet	50	---	---	---	---	---	---	---
Toluene	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	---
Ethylbenzene	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	---
Xylenes, total	ND	---	0.0750	mg/kg wet	50	---	---	---	---	---	---	---
Methyl tert-butyl ether (MTBE)	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	---
Naphthalene	ND	---	0.100	mg/kg wet	50	---	---	---	---	---	---	---
1,2-Dibromoethane (EDB)	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	---
1,2-Dichloroethane (EDC)	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	---
Isopropylbenzene	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	---
1,2,4-Trimethylbenzene	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	---
1,3,5-Trimethylbenzene	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	---
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 104 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>97 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>99 %</i>		<i>79-120 %</i>		<i>"</i>						
LCS (23E0496-BS1)						Prepared: 05/11/23 08:35 Analyzed: 05/11/23 10:58						
5035A/8260D												
Benzene	0.951	---	0.0100	mg/kg wet	50	1.00	---	95	80 - 120%	---	---	---
Toluene	0.888	---	0.0500	mg/kg wet	50	1.00	---	89	80 - 120%	---	---	---
Ethylbenzene	0.914	---	0.0250	mg/kg wet	50	1.00	---	91	80 - 120%	---	---	---
Xylenes, total	2.77	---	0.0750	mg/kg wet	50	3.00	---	92	80 - 120%	---	---	---
Methyl tert-butyl ether (MTBE)	0.942	---	0.0500	mg/kg wet	50	1.00	---	94	80 - 120%	---	---	---
Naphthalene	0.835	---	0.100	mg/kg wet	50	1.00	---	83	80 - 120%	---	---	---
1,2-Dibromoethane (EDB)	0.940	---	0.0500	mg/kg wet	50	1.00	---	94	80 - 120%	---	---	---
1,2-Dichloroethane (EDC)	0.937	---	0.0250	mg/kg wet	50	1.00	---	94	80 - 120%	---	---	---
Isopropylbenzene	0.932	---	0.0500	mg/kg wet	50	1.00	---	93	80 - 120%	---	---	---
1,2,4-Trimethylbenzene	0.956	---	0.0500	mg/kg wet	50	1.00	---	96	80 - 120%	---	---	---
1,3,5-Trimethylbenzene	0.943	---	0.0500	mg/kg wet	50	1.00	---	94	80 - 120%	---	---	---
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 104 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>96 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>79-120 %</i>		<i>"</i>						
Duplicate (23E0496-DUP2)						Prepared: 05/08/23 13:30 Analyzed: 05/11/23 14:10						

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<u>PBS Engineering and Environmental</u> 4412 S Corbett Ave Portland, OR 97239	Project: <u>Alsa Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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QUALITY CONTROL (QC) SAMPLE RESULTS

Selected Volatile Organic Compounds by EPA 5035A/8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC % REC	RPD RPD	Notes
Batch 23E0496 - EPA 5035A						Soil				
Duplicate (23E0496-DUP2)		Prepared: 05/08/23 13:30 Analyzed: 05/11/23 14:10								
QC Source Sample: TP1-5.0 (A3E1233-03)										
5035A/8260D										
Benzene	ND	---	0.0177	mg/kg dry	50	---	0.0150	---	---	*** 30%
Toluene	ND	---	0.0885	mg/kg dry	50	---	ND	---	---	30%
Ethylbenzene	ND	---	0.0442	mg/kg dry	50	---	ND	---	---	30%
Xylenes, total	ND	---	0.133	mg/kg dry	50	---	ND	---	---	30%
Methyl tert-butyl ether (MTBE)	ND	---	0.0885	mg/kg dry	50	---	ND	---	---	30%
Naphthalene	ND	---	0.177	mg/kg dry	50	---	ND	---	---	30%
1,2-Dibromoethane (EDB)	ND	---	0.0885	mg/kg dry	50	---	ND	---	---	30%
1,2-Dichloroethane (EDC)	ND	---	0.0442	mg/kg dry	50	---	ND	---	---	30%
Isopropylbenzene	ND	---	0.0885	mg/kg dry	50	---	ND	---	---	30%
1,2,4-Trimethylbenzene	ND	---	0.0885	mg/kg dry	50	---	0.0637	---	---	*** 30%
1,3,5-Trimethylbenzene	ND	---	0.0885	mg/kg dry	50	---	ND	---	---	30%
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 106 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>				
<i>Toluene-d8 (Surr)</i>		<i>93 %</i>		<i>80-120 %</i>		<i>"</i>				
<i>4-Bromofluorobenzene (Surr)</i>		<i>99 %</i>		<i>79-120 %</i>		<i>"</i>				

Matrix Spike (23E0496-MS1)						Prepared: 05/09/23 15:15 Analyzed: 05/11/23 19:42				
QC Source Sample: TP11-8.0 (A3E1233-19)										
5035A/8260D										
Benzene	1.78	---	0.0171	mg/kg dry	50	1.71	ND	104	77 - 121%	---
Toluene	1.66	---	0.0853	mg/kg dry	50	1.71	ND	97	77 - 121%	---
Ethylbenzene	1.69	---	0.0426	mg/kg dry	50	1.71	ND	99	76 - 122%	---
Xylenes, total	5.08	---	0.128	mg/kg dry	50	5.12	ND	99	78 - 124%	---
Methyl tert-butyl ether (MTBE)	1.69	---	0.0853	mg/kg dry	50	1.71	ND	99	73 - 125%	---
Naphthalene	1.55	---	0.171	mg/kg dry	50	1.71	ND	91	62 - 129%	---
1,2-Dibromoethane (EDB)	1.71	---	0.0853	mg/kg dry	50	1.71	ND	100	78 - 122%	---
1,2-Dichloroethane (EDC)	1.66	---	0.0426	mg/kg dry	50	1.71	ND	97	73 - 128%	---
Isopropylbenzene	1.72	---	0.0853	mg/kg dry	50	1.71	ND	101	68 - 134%	---
1,2,4-Trimethylbenzene	1.74	---	0.0853	mg/kg dry	50	1.71	ND	102	75 - 123%	---
1,3,5-Trimethylbenzene	1.74	---	0.0853	mg/kg dry	50	1.71	ND	102	73 - 124%	---
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 106 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>				
<i>Toluene-d8 (Surr)</i>		<i>97 %</i>		<i>80-120 %</i>		<i>"</i>				

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ORELAP ID: OR100062

<u>PBS Engineering and Environmental</u> 4412 S Corbett Ave Portland, OR 97239	Project: <u>Alea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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QUALITY CONTROL (QC) SAMPLE RESULTS

Selected Volatile Organic Compounds by EPA 5035A/8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC % REC	% REC Limits	RPD RPD	RPD Limit	Notes
Batch 23E0496 - EPA 5035A						Soil						
Matrix Spike (23E0496-MS1)		Prepared: 05/09/23 15:15 Analyzed: 05/11/23 19:42										
<u>QC Source Sample: TP11-8.0 (A3E1233-19)</u>												
<i>Surr: 4-Bromofluorobenzene (Surr)</i>		<i>Recovery: 99 %</i>			<i>Limits: 79-120 %</i>			<i>Dilution: 1x</i>				

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Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

<u>PBS Engineering and Environmental</u> 4412 S Corbett Ave Portland, OR 97239	Project: <u>Alesea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23E0848 - EPA 3546						Soil						
Blank (23E0848-BLK1)		Prepared: 05/19/23 07:38 Analyzed: 05/19/23 16:22										
EPA 8270E SIM												
Acenaphthene	ND	---	0.0100	mg/kg wet	1	---	---	---	---	---	---	---
Acenaphthylene	ND	---	0.0100	mg/kg wet	1	---	---	---	---	---	---	---
Anthracene	ND	---	0.0100	mg/kg wet	1	---	---	---	---	---	---	---
Benz(a)anthracene	ND	---	0.0100	mg/kg wet	1	---	---	---	---	---	---	---
Benzo(a)pyrene	ND	---	0.0100	mg/kg wet	1	---	---	---	---	---	---	---
Benzo(b)fluoranthene	ND	---	0.0100	mg/kg wet	1	---	---	---	---	---	---	---
Benzo(k)fluoranthene	ND	---	0.0100	mg/kg wet	1	---	---	---	---	---	---	---
Benzo(g,h,i)perylene	ND	---	0.0100	mg/kg wet	1	---	---	---	---	---	---	---
Chrysene	ND	---	0.0100	mg/kg wet	1	---	---	---	---	---	---	---
Dibenz(a,h)anthracene	ND	---	0.0100	mg/kg wet	1	---	---	---	---	---	---	---
Fluoranthene	ND	---	0.0100	mg/kg wet	1	---	---	---	---	---	---	---
Fluorene	ND	---	0.0100	mg/kg wet	1	---	---	---	---	---	---	---
Indeno(1,2,3-cd)pyrene	ND	---	0.0100	mg/kg wet	1	---	---	---	---	---	---	---
1-Methylnaphthalene	ND	---	0.0100	mg/kg wet	1	---	---	---	---	---	---	---
2-Methylnaphthalene	ND	---	0.0100	mg/kg wet	1	---	---	---	---	---	---	---
Naphthalene	ND	---	0.0100	mg/kg wet	1	---	---	---	---	---	---	---
Phenanthrene	ND	---	0.0100	mg/kg wet	1	---	---	---	---	---	---	---
Pyrene	ND	---	0.0100	mg/kg wet	1	---	---	---	---	---	---	---
Dibenzofuran	ND	---	0.0100	mg/kg wet	1	---	---	---	---	---	---	---
<i>Surr: 2-Fluorobiphenyl (Surr)</i>		<i>Recovery: 86 %</i>		<i>Limits: 44-120 %</i>		<i>Dilution: 1x</i>						
<i>p-Terphenyl-d14 (Surr)</i>		<i>101 %</i>		<i>54-127 %</i>		<i>"</i>						

LCS (23E0848-BS1)		Prepared: 05/19/23 07:38 Analyzed: 05/19/23 16:47										
EPA 8270E SIM												
Acenaphthene	0.768	---	0.0100	mg/kg wet	1	0.800	---	96	40 - 123%	---	---	---
Acenaphthylene	0.739	---	0.0100	mg/kg wet	1	0.800	---	92	32 - 132%	---	---	---
Anthracene	0.744	---	0.0100	mg/kg wet	1	0.800	---	93	47 - 123%	---	---	---
Benz(a)anthracene	0.727	---	0.0100	mg/kg wet	1	0.800	---	91	49 - 126%	---	---	---
Benzo(a)pyrene	0.769	---	0.0100	mg/kg wet	1	0.800	---	96	45 - 129%	---	---	---
Benzo(b)fluoranthene	0.679	---	0.0100	mg/kg wet	1	0.800	---	85	45 - 132%	---	---	---
Benzo(k)fluoranthene	0.804	---	0.0100	mg/kg wet	1	0.800	---	100	47 - 132%	---	---	---
Benzo(g,h,i)perylene	0.742	---	0.0100	mg/kg wet	1	0.800	---	93	43 - 134%	---	---	---
Chrysene	0.774	---	0.0100	mg/kg wet	1	0.800	---	97	50 - 124%	---	---	---

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Jason Woodcock, Project Manager



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PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: <u>Alesea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23E0848 - EPA 3546						Soil						
LCS (23E0848-BS1)		Prepared: 05/19/23 07:38		Analyzed: 05/19/23 16:47								
Dibenz(a,h)anthracene	0.797	---	0.0100	mg/kg wet	1	0.800	---	100	45 - 134%	---	---	
Fluoranthene	0.814	---	0.0100	mg/kg wet	1	0.800	---	102	50 - 127%	---	---	
Fluorene	0.775	---	0.0100	mg/kg wet	1	0.800	---	97	43 - 125%	---	---	
Indeno(1,2,3-cd)pyrene	0.779	---	0.0100	mg/kg wet	1	0.800	---	97	45 - 133%	---	---	
1-Methylnaphthalene	0.757	---	0.0100	mg/kg wet	1	0.800	---	95	40 - 120%	---	---	
2-Methylnaphthalene	0.754	---	0.0100	mg/kg wet	1	0.800	---	94	38 - 122%	---	---	
Naphthalene	0.721	---	0.0100	mg/kg wet	1	0.800	---	90	35 - 123%	---	---	
Phenanthrene	0.755	---	0.0100	mg/kg wet	1	0.800	---	94	50 - 121%	---	---	
Pyrene	0.893	---	0.0100	mg/kg wet	1	0.800	---	112	47 - 127%	---	---	
Dibenzofuran	0.764	---	0.0100	mg/kg wet	1	0.800	---	96	44 - 120%	---	---	
<i>Surr: 2-Fluorobiphenyl (Surr)</i>		<i>Recovery: 97 %</i>		<i>Limits: 44-120 %</i>		<i>Dilution: 1x</i>						
<i>p-Terphenyl-d14 (Surr)</i>		<i>105 %</i>		<i>54-127 %</i>		<i>"</i>						

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QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23E0517 - EPA 3511 (Bottle Extraction)						Water						
Blank (23E0517-BLK1)		Prepared: 05/11/23 12:21 Analyzed: 05/11/23 14:32										
<u>EPA 8270E LVI</u>												
Acenaphthene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	---
Acenaphthylene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	---
Anthracene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	---
Benz(a)anthracene	ND	---	0.0160	ug/L	1	---	---	---	---	---	---	---
Benzo(a)pyrene	ND	---	0.0160	ug/L	1	---	---	---	---	---	---	---
Benzo(b)fluoranthene	ND	---	0.0160	ug/L	1	---	---	---	---	---	---	---
Benzo(k)fluoranthene	ND	---	0.0160	ug/L	1	---	---	---	---	---	---	---
Benzo(g,h,i)perylene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	---
Chrysene	ND	---	0.0160	ug/L	1	---	---	---	---	---	---	---
Dibenz(a,h)anthracene	ND	---	0.0160	ug/L	1	---	---	---	---	---	---	---
Fluoranthene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	---
Fluorene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	---
Indeno(1,2,3-cd)pyrene	ND	---	0.0160	ug/L	1	---	---	---	---	---	---	---
1-Methylnaphthalene	ND	---	0.0640	ug/L	1	---	---	---	---	---	---	---
2-Methylnaphthalene	ND	---	0.0640	ug/L	1	---	---	---	---	---	---	---
Naphthalene	ND	---	0.0640	ug/L	1	---	---	---	---	---	---	---
Phenanthrene	ND	---	0.0640	ug/L	1	---	---	---	---	---	---	---
Pyrene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	---
Carbazole	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	---
Dibenzofuran	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	---
<i>Surr: Acenaphthylene-d8 (Surr)</i>		<i>Recovery: 116 %</i>		<i>Limits: 78-134 %</i>		<i>Dilution: 1x</i>						
<i>Benzo(a)pyrene-d12 (Surr)</i>		<i>100 %</i>		<i>80-132 %</i>		<i>"</i>						

LCS (23E0517-BS1)						Prepared: 05/11/23 12:21 Analyzed: 05/11/23 15:05						
<u>EPA 8270E LVI</u>												
Acenaphthene	1.47	---	0.0320	ug/L	1	1.60	---	92	80 - 120%	---	---	---
Acenaphthylene	1.60	---	0.0320	ug/L	1	1.60	---	100	80 - 124%	---	---	---
Anthracene	1.53	---	0.0320	ug/L	1	1.60	---	96	80 - 123%	---	---	---
Benz(a)anthracene	1.62	---	0.0160	ug/L	1	1.60	---	101	80 - 122%	---	---	---
Benzo(a)pyrene	1.54	---	0.0160	ug/L	1	1.60	---	96	80 - 129%	---	---	---
Benzo(b)fluoranthene	1.50	---	0.0160	ug/L	1	1.60	---	94	80 - 124%	---	---	---
Benzo(k)fluoranthene	1.48	---	0.0160	ug/L	1	1.60	---	92	80 - 125%	---	---	---
Benzo(g,h,i)perylene	1.48	---	0.0320	ug/L	1	1.60	---	92	80 - 120%	---	---	---

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Jason Woodcock, Project Manager



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PBS Engineering and Environmental	Project: Alsea Hwy	
4412 S Corbett Ave	Project Number: 24422.000	Report ID:
Portland, OR 97239	Project Manager: Nick Thornton	A3E1233 - 05 24 23 1039

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23E0517 - EPA 3511 (Bottle Extraction)												
						Water						
LCS (23E0517-BS1)	Prepared: 05/11/23 12:21 Analyzed: 05/11/23 15:05											
Chrysene	1.50	---	0.0160	ug/L	1	1.60	---	94	80 - 120%	---	---	
Dibenz(a,h)anthracene	1.45	---	0.0160	ug/L	1	1.60	---	90	80 - 120%	---	---	
Fluoranthene	1.57	---	0.0320	ug/L	1	1.60	---	98	80 - 126%	---	---	
Fluorene	1.52	---	0.0320	ug/L	1	1.60	---	95	77 - 127%	---	---	
Indeno(1,2,3-cd)pyrene	1.40	---	0.0160	ug/L	1	1.60	---	88	80 - 121%	---	---	
1-Methylnaphthalene	1.36	---	0.0640	ug/L	1	1.60	---	85	53 - 148%	---	---	
2-Methylnaphthalene	1.36	---	0.0640	ug/L	1	1.60	---	85	48 - 150%	---	---	
Naphthalene	1.47	---	0.0640	ug/L	1	1.60	---	92	78 - 120%	---	---	
Phenanthrene	1.41	---	0.0640	ug/L	1	1.60	---	88	80 - 120%	---	---	
Pyrene	1.56	---	0.0320	ug/L	1	1.60	---	98	80 - 125%	---	---	
Carbazole	1.66	---	0.0320	ug/L	1	1.60	---	104	65 - 141%	---	---	
Dibenzofuran	1.62	---	0.0320	ug/L	1	1.60	---	101	76 - 121%	---	---	
<i>Surr: Acenaphthylene-d8 (Surr)</i>		<i>Recovery: 119 %</i>		<i>Limits: 78-134 %</i>		<i>Dilution: 1x</i>						
<i>Benzo(a)pyrene-d12 (Surr)</i>		<i>102 %</i>		<i>80-132 %</i>		<i>"</i>						

LCS Dup (23E0517-BSD1)	Prepared: 05/11/23 12:21 Analyzed: 05/11/23 15:37											Q-19
EPA 8270E LVI												
Acenaphthene	1.46	---	0.0320	ug/L	1	1.60	---	91	80 - 120%	0.6	30%	
Acenaphthylene	1.64	---	0.0320	ug/L	1	1.60	---	102	80 - 124%	2	30%	
Anthracene	1.53	---	0.0320	ug/L	1	1.60	---	95	80 - 123%	0.3	30%	
Benz(a)anthracene	1.63	---	0.0160	ug/L	1	1.60	---	102	80 - 122%	0.8	30%	
Benzo(a)pyrene	1.55	---	0.0160	ug/L	1	1.60	---	97	80 - 129%	0.6	30%	
Benzo(b)fluoranthene	1.51	---	0.0160	ug/L	1	1.60	---	94	80 - 124%	0.1	30%	
Benzo(k)fluoranthene	1.50	---	0.0160	ug/L	1	1.60	---	94	80 - 125%	2	30%	
Benzo(g,h,i)perylene	1.45	---	0.0320	ug/L	1	1.60	---	90	80 - 120%	2	30%	
Chrysene	1.52	---	0.0160	ug/L	1	1.60	---	95	80 - 120%	1	30%	
Dibenz(a,h)anthracene	1.42	---	0.0160	ug/L	1	1.60	---	89	80 - 120%	1	30%	
Fluoranthene	1.60	---	0.0320	ug/L	1	1.60	---	100	80 - 126%	2	30%	
Fluorene	1.56	---	0.0320	ug/L	1	1.60	---	97	77 - 127%	2	30%	
Indeno(1,2,3-cd)pyrene	1.38	---	0.0160	ug/L	1	1.60	---	86	80 - 121%	2	30%	
1-Methylnaphthalene	1.47	---	0.0640	ug/L	1	1.60	---	92	53 - 148%	8	30%	
2-Methylnaphthalene	1.48	---	0.0640	ug/L	1	1.60	---	93	48 - 150%	8	30%	
Naphthalene	1.48	---	0.0640	ug/L	1	1.60	---	92	78 - 120%	0.3	30%	
Phenanthrene	1.39	---	0.0640	ug/L	1	1.60	---	87	80 - 120%	2	30%	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23E0517 - EPA 3511 (Bottle Extraction)						Water						
LCS Dup (23E0517-BSD1)		Prepared: 05/11/23 12:21			Analyzed: 05/11/23 15:37			Q-19				
Pyrene	1.58	---	0.0320	ug/L	1	1.60	---	99	80 - 125%	1	30%	
Carbazole	1.68	---	0.0320	ug/L	1	1.60	---	105	65 - 141%	1	30%	
Dibenzofuran	1.63	---	0.0320	ug/L	1	1.60	---	102	76 - 121%	0.8	30%	
<i>Surr: Acenaphthylene-d8 (Surr)</i>		<i>Recovery: 119 %</i>		<i>Limits: 78-134 %</i>		<i>Dilution: 1x</i>						
<i>Benzo(a)pyrene-d12 (Surr)</i>		<i>101 %</i>		<i>80-132 %</i>		<i>"</i>						

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QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23E0502 - Total Solids (Dry Weight) - 2022						Soil						
Duplicate (23E0502-DUP3)		Prepared: 05/11/23 10:11 Analyzed: 05/12/23 05:47										
QC Source Sample: TP1-5.0 (A3E1233-03)												
<u>EPA 8000D</u>												
% Solids	80.0	---	1.00	%	1	---	71.0	---	---	12	10%	Q-04

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

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SAMPLE PREPARATION INFORMATION

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Prep: EPA 3510C (Fuels/Acid Ext.)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 23E0689</u>							
A3E1233-01RE1	Water	NWTPH-Dx	05/08/23 11:30	05/16/23 11:18	1060mL/5mL	1000mL/5mL	0.94
A3E1233-02RE1	Water	NWTPH-Dx	05/08/23 12:00	05/16/23 11:18	1060mL/5mL	1000mL/5mL	0.94
A3E1233-10RE1	Water	NWTPH-Dx	05/09/23 08:30	05/16/23 11:18	1020mL/5mL	1000mL/5mL	0.98
A3E1233-12RE1	Water	NWTPH-Dx	05/09/23 09:30	05/16/23 11:18	1000mL/5mL	1000mL/5mL	1.00
A3E1233-20	Water	NWTPH-Dx	05/09/23 12:00	05/16/23 11:18	990mL/5mL	1000mL/5mL	1.01

Prep: EPA 3546 (Fuels)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 23E0662</u>							
A3E1233-03	Soil	NWTPH-Dx	05/08/23 13:30	05/16/23 07:26	10.21g/5mL	10g/5mL	0.98
A3E1233-04	Soil	NWTPH-Dx	05/08/23 13:45	05/16/23 07:26	10.61g/5mL	10g/5mL	0.94
A3E1233-05RE1	Soil	NWTPH-Dx	05/08/23 14:00	05/16/23 07:26	10.59g/5mL	10g/5mL	0.94
A3E1233-06RE1	Soil	NWTPH-Dx	05/08/23 14:10	05/16/23 07:26	10.37g/5mL	10g/5mL	0.96
A3E1233-07	Soil	NWTPH-Dx	05/08/23 14:30	05/16/23 07:26	10.31g/5mL	10g/5mL	0.97
A3E1233-08	Soil	NWTPH-Dx	05/08/23 14:45	05/16/23 07:26	10.29g/5mL	10g/5mL	0.97
A3E1233-09	Soil	NWTPH-Dx	05/08/23 15:30	05/16/23 07:26	10.19g/5mL	10g/5mL	0.98
A3E1233-11	Soil	NWTPH-Dx	05/09/23 09:00	05/16/23 07:26	10.5g/5mL	10g/5mL	0.95
A3E1233-13RE1	Soil	NWTPH-Dx	05/09/23 10:45	05/16/23 07:26	10.41g/5mL	10g/5mL	0.96
A3E1233-14RE1	Soil	NWTPH-Dx	05/09/23 11:30	05/16/23 07:26	10.08g/5mL	10g/5mL	0.99
A3E1233-15	Soil	NWTPH-Dx	05/09/23 11:45	05/16/23 07:26	10.1g/5mL	10g/5mL	0.99
A3E1233-16	Soil	NWTPH-Dx	05/09/23 13:30	05/16/23 07:26	10.87g/5mL	10g/5mL	0.92
A3E1233-17	Soil	NWTPH-Dx	05/09/23 14:15	05/16/23 07:26	10.57g/5mL	10g/5mL	0.95
A3E1233-18	Soil	NWTPH-Dx	05/09/23 14:45	05/16/23 07:26	10.45g/5mL	10g/5mL	0.96
A3E1233-19	Soil	NWTPH-Dx	05/09/23 15:15	05/16/23 07:26	10.59g/5mL	10g/5mL	0.94

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Prep: EPA 5030C

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 23E0432</u>							
A3E1233-01	Water	NWTPH-Gx (MS)	05/08/23 11:30	05/11/23 11:51	5mL/5mL	5mL/5mL	1.00
A3E1233-02	Water	NWTPH-Gx (MS)	05/08/23 12:00	05/11/23 11:51	5mL/5mL	5mL/5mL	1.00
A3E1233-10	Water	NWTPH-Gx (MS)	05/09/23 08:30	05/11/23 11:51	5mL/5mL	5mL/5mL	1.00
A3E1233-12	Water	NWTPH-Gx (MS)	05/09/23 09:30	05/11/23 11:51	5mL/5mL	5mL/5mL	1.00
A3E1233-20	Water	NWTPH-Gx (MS)	05/09/23 12:00	05/11/23 11:51	5mL/5mL	5mL/5mL	1.00

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: <u>A1sea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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SAMPLE PREPARATION INFORMATION

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

<u>Prep: EPA 5035A</u>					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
<u>Batch: 23E0496</u>							
A3E1233-03	Soil	NWTPH-Gx (MS)	05/08/23 13:30	05/08/23 13:30	5.18g/5mL	5g/5mL	0.97
A3E1233-04	Soil	NWTPH-Gx (MS)	05/08/23 13:45	05/08/23 13:45	5.7g/5mL	5g/5mL	0.88
A3E1233-05	Soil	NWTPH-Gx (MS)	05/08/23 14:00	05/08/23 14:00	5.51g/5mL	5g/5mL	0.91
A3E1233-06	Soil	NWTPH-Gx (MS)	05/08/23 14:10	05/08/23 14:10	5.31g/5mL	5g/5mL	0.94
A3E1233-07	Soil	NWTPH-Gx (MS)	05/08/23 14:30	05/08/23 14:30	5.48g/5mL	5g/5mL	0.91
A3E1233-08	Soil	NWTPH-Gx (MS)	05/08/23 14:45	05/08/23 14:45	5.71g/5mL	5g/5mL	0.88
A3E1233-09	Soil	NWTPH-Gx (MS)	05/08/23 15:30	05/08/23 15:30	6.14g/5mL	5g/5mL	0.81
A3E1233-11	Soil	NWTPH-Gx (MS)	05/09/23 09:00	05/09/23 09:00	5.95g/5mL	5g/5mL	0.84
A3E1233-13	Soil	NWTPH-Gx (MS)	05/09/23 10:45	05/09/23 10:45	5.25g/5mL	5g/5mL	0.95
A3E1233-14	Soil	NWTPH-Gx (MS)	05/09/23 11:30	05/09/23 11:30	4.41g/5mL	5g/5mL	1.13
A3E1233-15	Soil	NWTPH-Gx (MS)	05/09/23 11:45	05/09/23 11:45	5.51g/5mL	5g/5mL	0.91
A3E1233-16	Soil	NWTPH-Gx (MS)	05/09/23 13:30	05/09/23 13:30	5.53g/5mL	5g/5mL	0.90
A3E1233-17	Soil	NWTPH-Gx (MS)	05/09/23 14:15	05/09/23 14:15	5.96g/5mL	5g/5mL	0.84
A3E1233-18	Soil	NWTPH-Gx (MS)	05/09/23 14:45	05/09/23 14:45	5.65g/5mL	5g/5mL	0.89
A3E1233-19	Soil	NWTPH-Gx (MS)	05/09/23 15:15	05/09/23 15:15	5.65g/5mL	5g/5mL	0.89

BTEX+N Compounds by EPA 8260D

<u>Prep: EPA 5030C</u>					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
<u>Batch: 23E0432</u>							
A3E1233-01	Water	EPA 8260D	05/08/23 11:30	05/11/23 11:51	5mL/5mL	5mL/5mL	1.00
A3E1233-02	Water	EPA 8260D	05/08/23 12:00	05/11/23 11:51	5mL/5mL	5mL/5mL	1.00
A3E1233-12	Water	EPA 8260D	05/09/23 09:30	05/11/23 11:51	5mL/5mL	5mL/5mL	1.00

<u>Prep: EPA 5035A</u>					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
<u>Batch: 23E0496</u>							
A3E1233-03	Soil	5035A/8260D	05/08/23 13:30	05/08/23 13:30	5.18g/5mL	5g/5mL	0.97
A3E1233-04	Soil	5035A/8260D	05/08/23 13:45	05/08/23 13:45	5.7g/5mL	5g/5mL	0.88
A3E1233-06	Soil	5035A/8260D	05/08/23 14:10	05/08/23 14:10	5.31g/5mL	5g/5mL	0.94
A3E1233-07	Soil	5035A/8260D	05/08/23 14:30	05/08/23 14:30	5.48g/5mL	5g/5mL	0.91
A3E1233-08	Soil	5035A/8260D	05/08/23 14:45	05/08/23 14:45	5.71g/5mL	5g/5mL	0.88
A3E1233-09	Soil	5035A/8260D	05/08/23 15:30	05/08/23 15:30	6.14g/5mL	5g/5mL	0.81
A3E1233-11	Soil	5035A/8260D	05/09/23 09:00	05/09/23 09:00	5.95g/5mL	5g/5mL	0.84
A3E1233-13	Soil	5035A/8260D	05/09/23 10:45	05/09/23 10:45	5.25g/5mL	5g/5mL	0.95

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Jason Woodcock, Project Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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503-718-2323
ORELAP ID: OR100062

PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: <u>Alesea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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SAMPLE PREPARATION INFORMATION

BTEX+N Compounds by EPA 8260D

Prep: EPA 5035A					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
A3E1233-14	Soil	5035A/8260D	05/09/23 11:30	05/09/23 11:30	4.41g/5mL	5g/5mL	1.13
A3E1233-15	Soil	5035A/8260D	05/09/23 11:45	05/09/23 11:45	5.51g/5mL	5g/5mL	0.91
A3E1233-16	Soil	5035A/8260D	05/09/23 13:30	05/09/23 13:30	5.53g/5mL	5g/5mL	0.90
A3E1233-17	Soil	5035A/8260D	05/09/23 14:15	05/09/23 14:15	5.96g/5mL	5g/5mL	0.84
A3E1233-18	Soil	5035A/8260D	05/09/23 14:45	05/09/23 14:45	5.65g/5mL	5g/5mL	0.89
A3E1233-19	Soil	5035A/8260D	05/09/23 15:15	05/09/23 15:15	5.65g/5mL	5g/5mL	0.89

Selected Volatile Organic Compounds by EPA 8260D

Prep: EPA 5030C					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
<u>Batch: 23E0432</u>							
A3E1233-10	Water	EPA 8260D	05/09/23 08:30	05/11/23 11:51	5mL/5mL	5mL/5mL	1.00
A3E1233-20	Water	EPA 8260D	05/09/23 12:00	05/11/23 11:51	5mL/5mL	5mL/5mL	1.00
<u>Batch: 23E0559</u>							
A3E1233-21	Water	EPA 8260D	05/08/23 07:00	05/12/23 10:47	5mL/5mL	5mL/5mL	1.00

Selected Volatile Organic Compounds by EPA 5035A/8260D

Prep: EPA 5035A					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
<u>Batch: 23E0496</u>							
A3E1233-05	Soil	5035A/8260D	05/08/23 14:00	05/08/23 14:00	5.51g/5mL	5g/5mL	0.91

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Prep: EPA 3546					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
<u>Batch: 23E0848</u>							
A3E1233-03	Soil	EPA 8270E SIM	05/08/23 13:30	05/19/23 12:50	10.31g/5mL	10g/5mL	0.97
A3E1233-06	Soil	EPA 8270E SIM	05/08/23 14:10	05/19/23 12:50	10.63g/5mL	10g/5mL	0.94
A3E1233-08	Soil	EPA 8270E SIM	05/08/23 14:45	05/19/23 12:50	10.39g/5mL	10g/5mL	0.96
A3E1233-13	Soil	EPA 8270E SIM	05/09/23 10:45	05/19/23 12:50	10.32g/5mL	10g/5mL	0.97

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

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ANALYTICAL REPORT

Apex Laboratories, LLC

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503-718-2323
ORELAP ID: OR100062

PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: Alsa Hwy Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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SAMPLE PREPARATION INFORMATION

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

<u>Prep: EPA 3511 (Bottle Extraction)</u>					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
<u>Batch: 23E0517</u>							
A3E1233-01	Water	EPA 8270E LVI	05/08/23 11:30	05/11/23 12:21	124.78mL/5mL	125mL/5mL	1.00
A3E1233-10	Water	EPA 8270E LVI	05/09/23 08:30	05/11/23 12:21	113.57mL/5mL	125mL/5mL	1.10
A3E1233-20	Water	EPA 8270E LVI	05/09/23 12:00	05/11/23 12:21	109.92mL/5mL	125mL/5mL	1.14

Percent Dry Weight

<u>Prep: Total Solids (Dry Weight) - 2022</u>					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
<u>Batch: 23E0502</u>							
A3E1233-03	Soil	EPA 8000D	05/08/23 13:30	05/11/23 10:11			NA
A3E1233-04	Soil	EPA 8000D	05/08/23 13:45	05/11/23 10:11			NA
A3E1233-05	Soil	EPA 8000D	05/08/23 14:00	05/11/23 10:11			NA
A3E1233-06	Soil	EPA 8000D	05/08/23 14:10	05/11/23 10:11			NA
A3E1233-07	Soil	EPA 8000D	05/08/23 14:30	05/11/23 10:11			NA
A3E1233-08	Soil	EPA 8000D	05/08/23 14:45	05/11/23 10:11			NA
A3E1233-09	Soil	EPA 8000D	05/08/23 15:30	05/11/23 10:11			NA
A3E1233-11	Soil	EPA 8000D	05/09/23 09:00	05/11/23 10:11			NA
A3E1233-13	Soil	EPA 8000D	05/09/23 10:45	05/11/23 10:11			NA
A3E1233-14	Soil	EPA 8000D	05/09/23 11:30	05/11/23 10:11			NA
A3E1233-15	Soil	EPA 8000D	05/09/23 11:45	05/11/23 10:11			NA
A3E1233-16	Soil	EPA 8000D	05/09/23 13:30	05/11/23 10:11			NA
A3E1233-17	Soil	EPA 8000D	05/09/23 14:15	05/11/23 10:11			NA
A3E1233-18	Soil	EPA 8000D	05/09/23 14:45	05/11/23 10:11			NA
A3E1233-19	Soil	EPA 8000D	05/09/23 15:15	05/11/23 10:11			NA

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Jason Woodcock, Project Manager



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503-718-2323
ORELAP ID: OR100062

<u>PBS Engineering and Environmental</u> 4412 S Corbett Ave Portland, OR 97239	Project: <u>Aalsea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

- F-03** The result for this hydrocarbon range is elevated due to the presence of individual analyte peaks in the quantitation range that are not representative of the fuel pattern reported.
- F-11** The hydrocarbon pattern indicates possible weathered diesel, mineral oil, or a contribution from a related component.
- F-15** Results for diesel are estimated due to overlap from the reported oil result.
- F-16** Results for oil are estimated due to overlap from the reported diesel result.
- F-20** Result for Diesel is Estimated due to overlap from Gasoline Range Organics or other VOCs.
- Q-04** Spike recovery and/or RPD is outside control limits due to a non-homogeneous sample matrix.
- Q-19** Blank Spike Duplicate (BSD) sample analyzed in place of Matrix Spike/Duplicate samples due to limited sample amount available for analysis.
- Q-42** Matrix Spike and/or Duplicate analysis was performed on this sample. % Recovery or RPD for this analyte is outside laboratory control limits. (Refer to the QC Section of Analytical Report.)
- R-02** The Reporting Limit for this analyte has been raised to account for interference from coeluting organic compounds present in the sample.
- S-01** Surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interference.
- S-05** Surrogate recovery is estimated due to sample dilution required for high analyte concentration and/or matrix interference.

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<u>PBS Engineering and Environmental</u> 4412 S Corbett Ave Portland, OR 97239	Project: <u>Alsa Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
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REPORTING NOTES AND CONVENTIONS:

Abbreviations:

- DET Analyte DETECTED at or above the detection or reporting limit.
- ND Analyte NOT DETECTED at or above the detection or reporting limit.
- NR Result Not Reported.
- RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

- Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as " dry", " wet", or " " (blank) designation.
- " dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.
- " wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.
- " " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) are not included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

- " --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
- " *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to 1/2 the Reporting Limit (RL).
-For Blank hits falling between 1/2 the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.

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REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

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Jason Woodcock, Project Manager



ANALYTICAL REPORT

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LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation)
EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation
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All reported analytes are included in Apex Laboratories' current ORELAP scope.

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation. Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provided by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories

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Jason Woodcock, Project Manager



ANALYTICAL REPORT

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503-718-2323
ORELAP ID: OR100062

PBS Engineering and Environmental	Project: Alsea Hwy	
4412 S Corbett Ave	Project Number: 24422.000	Report ID:
Portland, OR 97239	Project Manager: Nick Thornton	A3E1233 - 05 24 23 1039

APEX LABS
6700 SW Sandburg St., Tigard, OR 97223 Ph: 503-718-2323

CHAIN OF CUSTODY

Lab # **A3E1233** COC 1 of 2

Company: **PBS** Project Mgr: **Nick Thornton** Project Name: **Alsea Hwy** Project #: **24422.000**

Address: **NT** Phone: _____ Email: _____ PO #: _____

Sampled by: **NT**

Site Location: _____ State: **OR** County: _____

SAMPLE ID	DATE	TIME	MATRIX	# OF CONTAINERS	ANALYSIS REQUEST			
					8260 BTEX RTEX+Z	8260 RBDM VOCs	8260 Halo VOCs	8260 VOCs Full List
MW4	5/8/23	1130	Ken	7	X	X	X	X
MW1	1200			7	X	X	X	X
TP1-5.0	1330	5.1		2	X	X	X	X
TP1-10.0	1345			2	X	X	X	X
TP2-5.0	1410			2	X	X	X	X
TP3-6.0	1430			2	X	X	X	X
TP3-10.0	1445			2	X	X	X	X
TP4-9.0	1530			2	X	X	X	X
TP2-6.0	5/9/23	0830	Ken	7	X	X	X	X

Standard Turn Around Time (TAT) = 10 Business Days

TAT Requested (circle): **3 Day** 1 Day 2 Day 3 Day 5 Day Standard Other: _____

SPECIAL INSTRUCTIONS: **Extract + 1.0 BATHS for all samples**

RELINQUISHED BY: _____
Signature: _____ Date: **5/11/23**

Printed Name: **Nick Thornton** Time: **1200**

Company: **PBS**

RECEIVED BY: _____
Signature: _____ Date: **5-10-23**

Printed Name: **Doug Silveira** Time: **1200**

Company: **Apex**

Apex Laboratories

Jason Woodcock, Project Manager

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ANALYTICAL REPORT

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ORELAP ID: OR100062

PBS Engineering and Environmental	Project: <u>Alsea Hwy</u>	
4412 S Corbett Ave	Project Number: 24422.000	Report ID:
Portland, OR 97239	Project Manager: Nick Thornton	A3E1233 - 05 24 23 1039

CHAIN OF CUSTODY

APEX LABS 6700 SW Sandburg St., Tigard, OR 97223 Ph: 503-718-2323

Lab # 1881035 COC 2 of 2

Company: <u>PBS</u>	Project Mgr: <u>Nick Thornton</u>	Project Name: <u>Alsea Hwy</u>	Project #: <u>24422.000</u>	PO #
Address:		Email:		
Sampled by: <u>MT</u>		Phone:		
ANALYSIS REQUEST				
Site Location:	State: <u>OR</u>	County:	Priority Metals (13) Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Hg, Mg, Mn, Mo, Ni, K, Sg, Ag, Na, Ti, V, Zn	
SAMPLE ID	MATRIX	TIME	DATE	8081 Pesticides
<u>TR5-10.0</u>	<u>EMD3 OVC 1</u>	<u>2</u>	<u>5/13/23</u>	8082 PCBs
<u>TR1-6W</u>	<u>1030 Au</u>	<u>7</u>	<u>10/5/21</u>	8270 Semi-Vols Full List
<u>TR6-10.0</u>	<u>1035 Cu</u>	<u>2</u>	<u>1/30</u>	8270 SIM PAHs
<u>TR7-1.0</u>	<u>1130</u>	<u>2</u>	<u>1/45</u>	8260 VOCs Full List
<u>TR7-10.0</u>	<u>1145</u>	<u>2</u>	<u>1/45</u>	8260 Halo VOCs
<u>TR8-8.0</u>	<u>1330</u>	<u>2</u>	<u>1/15</u>	8260 RBDM VOCs
<u>TR9-8.0</u>	<u>1415</u>	<u>2</u>	<u>1/15</u>	8260 BTEX-SIXPK
<u>TR10-8.0</u>	<u>1445</u>	<u>2</u>	<u>1/15</u>	NWTPH-CX
<u>TR6-6W</u>	<u>1515</u>	<u>2</u>	<u>5/12/23</u>	NWTPH-DX
<u>TR20-500</u>	<u>1200 Au</u>	<u>7</u>	<u>5/12/23</u>	NWTPH-HCD
	<u>1200 Cu</u>	<u>7</u>	<u>5/12/23</u>	# OF CONTAINERS
	<u>1200 Ag</u>	<u>7</u>	<u>5/12/23</u>	

Standard Turn Around Time (TAT) = 10 Business Days

TAT Requested (circle): Standard

1 Day 2 Day 3 Day 5 Day Other:

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY: Signature: <u>[Signature]</u> Printed Name: <u>Nick Thornton</u> Company: <u>PBS</u>	RECEIVED BY: Signature: <u>[Signature]</u> Printed Name: <u>Daryl Salzer</u> Company: <u>Apex</u>
Date: <u>5-10-23</u> Time: <u>1200</u>	Date: Time:

SPECIAL INSTRUCTIONS: Extract + hold all PAHs

Form Y-002 R-00

Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jason Woodcock, Project Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

PBS Engineering and Environmental 4412 S Corbett Ave Portland, OR 97239	Project: <u>Alea Hwy</u> Project Number: 24422.000 Project Manager: Nick Thornton	Report ID: A3E1233 - 05 24 23 1039
--	---	---

APEX LABS COOLER RECEIPT FORM

Client: PBS Element WO#: A3 E1233

Project/Project #: Alea Hwy / 24422.000

Delivery Info:
 Date/time received: 5-10-23 @ 1200 By: DJS
 Delivered by: Apex Client ESS FedEx UPS Radio Morgan SDS Evergreen Other

Cooler Inspection Date/time inspected: 5-10-23 @ 1205 By: DJS

Chain of Custody included? Yes No
 Signed/dated by client? Yes No

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	<u>2.8</u>	<u>3.6</u>					
Custody seals? (Y/N)	<u>N</u>	<u>N</u>					
Received on ice? (Y/N)	<u>Y</u>	<u>Y</u>					
Temp. blanks? (Y/N)	<u>Y</u>	<u>Y</u>					
Ice type: (Gel/Real/Other)	<u>Real</u>	<u>Real</u>					
Condition (In/Out):	<u>In</u>	<u>In</u>					

Cooler out of temp? (Y/N) Possible reason why: _____
 Green dots applied to out of temperature samples? Yes No
 Out of temperature samples form initiated? Yes No
Sample Inspection: Date/time inspected: 5/10/23 @ 13:24 By: AAW

All samples intact? Yes No Comments: _____

Bottle labels/COCs agree? Yes No Comments: TP6-GW 1/3 VOAs have no ID, matched with cont. in same bag

COC/container discrepancies form initiated? Yes No
 Containers/volumes received appropriate for analysis? Yes No Comments: _____

Do VOA vials have visible headspace? Yes No NA
 Comments: TP2-GW, TP1-GW, TP6-GW = 3/3 VOAs have seal

Water samples: pH checked: Yes No NA pH appropriate? Yes No NA
 Comments: _____

Additional information: No TB#

Labeled by: AAW Witness: [Signature] Cooler Inspected by: AAW
 Form Y-003 R-00

Appendix C

Photo Documentation



Photo 1. Looking east toward the former aboveground storage tanks (ASTs) and Card Locks office structure.



Photo 2. Looking west at the former fuel dispensers.



Photo 3. An excavator was used to clear blackberries and brush prior to beginning the test pit investigation.



Photo 4. Excavating test pit TP-2 in the area of the former fuel dispensers.



Photo 5. Spoils from test pit TP-3 where petroleum contamination was encountered at depth.



Photo 6. Very weathered petroleum-impacted soil was encountered during excavation of test pit TP-4.



Photo 7. Test pit TP-5 was completed to the east of TP-3.



Photo 8. Collecting a groundwater sample from test pit TP-6.



Photo 9. Completing test pit TP-8 to delineate petroleum contamination to the south.

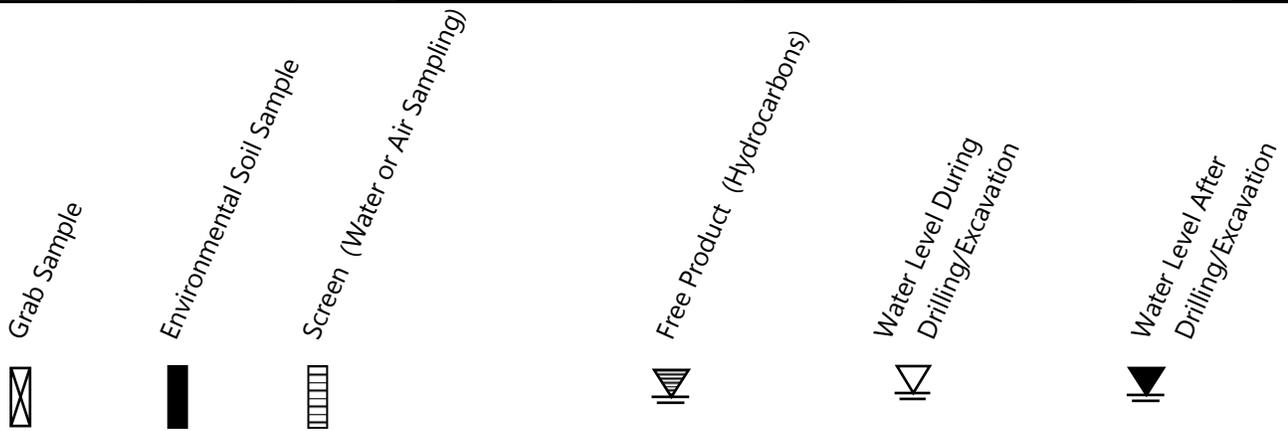


Photo 10. Test pit TP-11 being excavated to delineate petroleum contamination to the west.

Appendix D

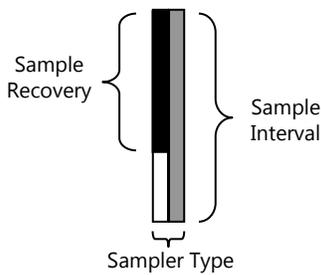
Test Pit Logs

SAMPLING DESCRIPTIONS

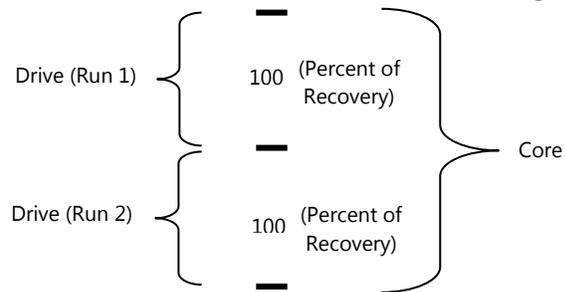


LOG GRAPHICS

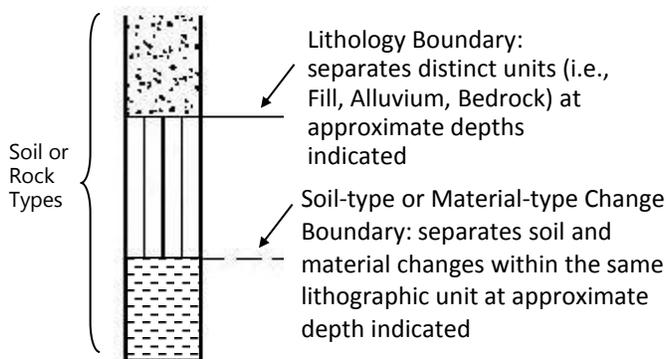
Sampling Symbols



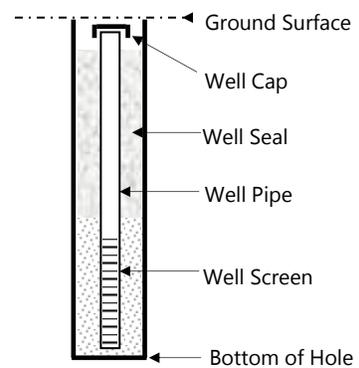
Direct Push, Sonic, Vibracore Drilling



Soil and Rock Divisions



Well Detail



ENVIRONMENTAL TESTING EXPLANATIONS

ATD	At Time of Drilling	PPM	Parts PerMillion
BGS	Below Ground Surface	ND	Not Detected
MSL	Mean Sea Level	NS	No Sheen
MW	Monitoring Well (Water Sampling)	SS	Slight Sheen
OD	Outside Diameter	MS	Moderate Sheen
PID	Photoionization Detector Headspace Analysis	HS	High Sheen

Observations presented on the logs are based on limited field data and are not intended to be used for site engineering or construction decision purposes.



1680 NE ALSEA HIGHWAY
WALDPORT, OREGON

TEST PIT TP-1

PBS PROJECT NUMBER:
24422.000

TEST PIT TP-1 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE	COMMENTS					
0.0		Brown, sandy SILT (ML) with cobbles; non-plastic; fine sand; subangular cobbles; dry					Petroleum contaminated soil encountered from 3 to 10 feet bgs					
2.0												
4.0												
6.0												
8.0												
10.0												
10.0								Dark gray, lean CLAY (CL); wet	▽		TP1-10.0 TP1-GW	
12.0								Final depth 11.0 feet bgs; test pit backfilled with excavated material to existing ground surface.				
14.0												

TEST PIT LOG - 1 PER PAGE - ENV_24422.000_TP1-11_20230522_GPJ_DATA\TMPL\GDT_PRINT DATE: 6/1/23\RPB

EXCAVATION METHOD: Excavator
EXCAVATED BY: Great Western Corporation

LOGGED BY: N. Thornton
COMPLETED: 5/08/23



1680 NE ALSEA HIGHWAY
WALDPORT, OREGON

TEST PIT TP-2

PBS PROJECT NUMBER:
24422.000

TEST PIT TP-2 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE	COMMENTS	
								0.0
2.0								
4.0								
6.0				200.1	TP2-5.0		Petroleum contaminated soil encountered from 3 to 11 feet bgs	
8.0								
10.0		becomes wet			TP2-10.0 TP2-GW			
12.0		Final depth 11.0 feet bgs; test pit backfilled with excavated material to existing ground surface.						
14.0								

TEST PIT LOG - 1 PER PAGE - ENV_24422.000_TP1-11_20230522_GPJ_DATA\TMPL\GDT_PRINT DATE: 6/1/23.RPG

EXCAVATION METHOD: Excavator
EXCAVATED BY: Great Western Corporation

LOGGED BY: N. Thornton
COMPLETED: 5/08/23



1680 NE ALSEA HIGHWAY
WALDPORT, OREGON

TEST PIT TP-3

PBS PROJECT NUMBER:
24422.000

TEST PIT TP-3 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE	COMMENTS
2.0							
4.0							
6.0					TP3-6.0		
8.0							
10.0		Lean CLAY (CL); damp		24.0	TP3-10.0		Petroleum contaminated soil encountered from 10 to 11 feet bgs
12.0		Final depth 11.0 feet bgs; test pit backfilled with excavated material to existing ground surface. Groundwater not encountered at time of exploration.					
14.0							

TEST PIT LOG - 1 PER PAGE - ENV_24422.000_TP1-11_20230522_GPJ_DATA\TMPL\GDT_PRINT DATE: 6/1/23.RPG

EXCAVATION METHOD: Excavator
EXCAVATED BY: Great Western Corporation

LOGGED BY: N. Thornton
COMPLETED: 5/08/23



1680 NE ALSEA HIGHWAY
WALDPORT, OREGON

TEST PIT TP-4

PBS PROJECT NUMBER:
24422.000

TEST PIT TP-4 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE	COMMENTS
2.0							
4.0	becomes black					Very weathered diesel odor and dark staining from 4 to 11 feet bgs; no sheen	
6.0							
8.0				0.5			
10.0		becomes wet			TP4-9.0		
							Insufficient groundwater accumulation for sampling
12.0		Final depth 11.0 feet bgs; test pit backfilled with excavated material to existing ground surface.					
14.0							

TEST PIT LOG - 1 PER PAGE - ENV_24422.000_TP1-11_20230522_GPJ_DATA\TMPL\GDT_PRINT DATE: 6/1/23.RPG

EXCAVATION METHOD: Excavator
EXCAVATED BY: Great Western Corporation

LOGGED BY: N. Thornton
COMPLETED: 5/08/23



1680 NE ALSEA HIGHWAY
WALDPORT, OREGON

TEST PIT TP-5

PBS PROJECT NUMBER:
24422.000

TEST PIT TP-5 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE	COMMENTS
2.0							
4.0							
6.0							
8.0		becomes damp		0.0			
10.0					TP5-10.0		
12.0		Final depth 11.0 feet bgs; test pit backfilled with excavated material to existing ground surface. Groundwater not encountered at time of exploration.					
14.0							

TEST PIT LOG - 1 PER PAGE - ENV_24422.000_TP1-11_20230522_GPJ_DATA\TMPL\GDT_PRINT DATE: 6/1/23.RPG

EXCAVATION METHOD: Excavator
EXCAVATED BY: Great Western Corporation

LOGGED BY: N. Thornton
COMPLETED: 5/09/23



1680 NE ALSEA HIGHWAY
WALDPORT, OREGON

TEST PIT TP-6

PBS PROJECT NUMBER:
24422.000

TEST PIT TP-6 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE	COMMENTS
2.0							
4.0							
6.0		becomes black					
8.0							
10.0				1.0			
					TP6-10.0 TP6-GW		Very mild weathered diesel odor from 6 to 11 feet bgs
12.0		Final depth 11.0 feet bgs; test pit backfilled with excavated material to existing ground surface.					
14.0							

TEST PIT LOG - 1 PER PAGE - ENV_24422.000_TP1-11_20230522_GPJ_DATA\TMPL\GDT_PRINT DATE: 6/1/23.RPG

EXCAVATION METHOD: Excavator
EXCAVATED BY: Great Western Corporation

LOGGED BY: N. Thornton
COMPLETED: 5/09/23



1680 NE ALSEA HIGHWAY
WALDPORT, OREGON

TEST PIT TP-7

PBS PROJECT NUMBER:
24422.000

TEST PIT TP-7 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE	COMMENTS
2.0							
4.0							
6.0							
8.0				0.0			
10.0		Brown SILT (ML) with sand; low plasticity; fine sand; damp			TP7-10.0	☒	
12.0		Final depth 11.0 feet bgs; test pit backfilled with excavated material to existing ground surface. Groundwater not encountered at time of exploration.					
14.0							

TEST PIT LOG - 1 PER PAGE - ENV_24422.000_TP1-11_20230522_GPJ_DATA\TMPL\GDT_PRINT DATE: 6/1/23.RPG

EXCAVATION METHOD: Excavator
EXCAVATED BY: Great Western Corporation

LOGGED BY: N. Thornton
COMPLETED: 5/09/23



1680 NE ALSEA HIGHWAY
WALDPORT, OREGON

TEST PIT TP-8

PBS PROJECT NUMBER:
24422.000

TEST PIT TP-8 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE	COMMENTS
2.0							
4.0							
6.0							
8.0		Brown-gray SILT (ML) with sand; low plasticity; fine sand; damp		0.0	TP8-8.0	☒	
10.0							
12.0		Final depth 11.0 feet bgs; test pit backfilled with excavated material to existing ground surface. Groundwater not encountered at time of exploration.					
14.0							

TEST PIT LOG - 1 PER PAGE - ENV_24422.000_TP1-11_20230522_GPJ_DATA\TMPL\GDT_PRINT DATE: 6/1/23.RPG

EXCAVATION METHOD: Excavator
EXCAVATED BY: Great Western Corporation

LOGGED BY: N. Thornton
COMPLETED: 5/09/23



1680 NE ALSEA HIGHWAY
WALDPORT, OREGON

TEST PIT TP-9

PBS PROJECT NUMBER:
24422.000

TEST PIT TP-9 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE	COMMENTS
2.0							
4.0		Brown SILT (ML); low plasticity					
6.0		becomes gray-blue					Petroleum contaminated soil encountered from 6 to 11 feet bgs
8.0				39.9	TP9-8.0		
10.0		becomes wet					
12.0		Final depth 11.0 feet bgs; test pit backfilled with excavated material to existing ground surface.					
14.0							

TEST PIT LOG - 1 PER PAGE - ENV_24422.000_TP1-11_20230522_GPJ_DATA\TMPL\GDT_PRINT DATE: 6/1/23.RPG

EXCAVATION METHOD: Excavator
EXCAVATED BY: Great Western Corporation

LOGGED BY: N. Thornton
COMPLETED: 5/09/23



1680 NE ALSEA HIGHWAY
WALDPORT, OREGON

TEST PIT TP-10

PBS PROJECT NUMBER:
24422.000

TEST PIT TP-10 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE	COMMENTS
0.0		Brown, silty SAND (SM); non-plastic; fine sand; dry					No field evidence of contamination throughout
2.0							
4.0		Brown-gray SILT (ML) with sand; low plasticity; fine sand; damp					
6.0				0.0			
8.0				0.0	TP10-80		
10.0							
12.0		Final depth 11.0 feet bgs; test pit backfilled with excavated material to existing ground surface. Groundwater not encountered at time of exploration.					
14.0							

TEST PIT LOG - 1 PER PAGE - ENV_24422.000_TP1-11_20230522_GPJ_DATA\TMPL\GDT_PRINT DATE: 6/1/23.RPG

EXCAVATION METHOD: Excavator
EXCAVATED BY: Great Western Corporation

LOGGED BY: N. Thornton
COMPLETED: 5/09/23

Appendix E

Beneficial Water Use Determination

Beneficial Water Use Determination
Vicinity Well Logs Identified Within 0.25 Mile of Site

l_county_cod	wl_nbr	name_last	name_first	street	city	state	type_of_log	pth_first_wa	depth_drilled	completed_depth	ost_static_water_lev	complete_date	startcard_nbr	work_new	work_abandonment	township	township_char	range	range_char	sctn	qtr160	qtr40	tax_lot	street_of_well
LINC	50716	WOOD	M R	7654 NE AVERY	NEWPORT	OR	G		22	0	12.9	8/11/1998		X	X	13	S	11	W	20	NW	SE	2700	1680 ALSEA HWY, WALDPOR
LINC	50717	WOOD	M R	7654 NE AVERY	NEWPORT	OR	G		16	0	12.3	8/11/1998		X	X	13	S	11	W	20	NW	SE	2700	1680 ALSEA HWY, WALDPOR
LINC	50897	WOOD	MICK	7654 AVERY NE	NEWPORT	OR	M	7	16	15	7.4	3/30/1999	81149	X		13	S	11	W	20	SE	NW	2700	1680 ALSEA HWY, WALDPOR
LINC	50898	WOOD	MICK	7654 NE AVERY	NEWPORT	OR	M	3	13	13	3.7	3/30/1999	81167	X		13	S	11	W	20	SE	NW	2700	1680 ALSEA HWY, WALDPOR
LINC	50899	WOOD	MICK	7654 NE AVERY	NEWPORT	OR	M	3	10	10	1.6	3/30/1999	81166	X		13	S	11	W	20	SE	NW	2700	1680 ALSEA HWY, WALDPOR
LINC	50900	WOOD	MICK	7654 NE AVERY	NEWPORT	OR	M	9	16	15	8.3	3/30/1999	81165	X		13	S	11	W	20	SE	NW	2700	1680 ALSEA HWY, WALDPOR
LINC	52626			4910 TIEDEMAN RD	BROOKLYN	OH	G		40	0	15	1/6/2009		X	X	13	S	11	W	20	SE	NW	2300	1630 NE ALSEA HWY, WALDPOR