Technical Memorandum

To: Ray Hoy, Oregon DEQ
Katie Daugherty, Oregon DEQ

From: Michael Pickering, MFA
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Date: June 27, 2025

MFA Project No.: M0785.36.001

REGISTERED OREGON MICHAEL J. PICKERING No. G1932 GEOLOGIST
EXPIRES: 1/1/2026
This digital seal certifies the signatory and document content.

Re: Portland Water Bureau Groundwater Well Sampling April 2025 Event – Columbia South Shore Groundwater Assessment – SEMS ID: ORN001021047

Maul Foster & Alongi, Inc. (MFA) prepared this Technical Memorandum to present the purpose, scope of work, and discuss field event details from the groundwater well sampling event conducted on the Portland Water Bureau's (PWB) Columbia South Shore Well Field (CSSWF, the Site, see Figure 1) in Portland, Oregon. MFA conducted the sampling event to support Oregon Department of Environmental Quality's (DEQ) characterization of the CSSWF. The CSSWF is an approximately 10 square mile Site that provides a secondary drinking water source for the PWB's system. This memorandum was prepared for DEQ under Task 3 of Task Order 067-23-22 and the work was funded by DEQ's "Preliminary Assessment/Site Inspection" Cooperative Agreement with the United States Environmental Protection Agency (EPA).

Purpose

DEQ requested and received approval from the EPA to perform an Expanded Preliminary Assessment of groundwater in the CSSWF due to its importance as the secondary drinking water source for Portland, Oregon and other nearby cities.

According to the *Expanded Preliminary Assessment Sampling and Analysis Plan*[1] (work plan) prepared by DEQ; "the CSSWF was established by the City of Portland starting in the 1980s as a secondary drinking water source to supplement its primary surface water source, the Bull Run watershed. Currently, the CSSWF has a service capacity of 80 to 95 million gallons per day." PWB conducts regular monitoring for a variety of potential pollutants for drinking water. Per- and polyfluoroalkyl substances (PFAS) were added the list of analyses in recent sampling events to monitor for exceedances of EPA's 2024 Maximum Contaminant Levels for PFAS compounds. PFAS has been detected in a CSSWF monitoring well PWB-1.

[1] DEQ. 2025. *Expanded Preliminary Assessment Sampling and Analysis Plan, Oregon Department of Environmental Quality, March 13.*

Additionally, volatile organic compounds (VOCs), including chlorinated solvents, have been detected in some CSSWF monitoring wells.

Scope of Work

The MFA scope of work included the following tasks:

- Prepare for and perform a sampling event to collect groundwater samples of 30 selected wells within the CSSWF. Preparation included review of DEQ and EPA documents, procurement of needed PFAS-free sampling supplies and equipment, laboratory coordination, and obtaining City of Portland right-of-way permits to sample wells present within their jurisdiction.
- Sample management and submittal to EPA's Manchester Laboratory in Port Orchard, Washington and DEQ's contract laboratory (Pace National) in Mount Juliet, Tennessee.
- Coordinate investigation derived waste (IDW) sampling and off-site disposal.
- Prepare a technical memorandum documenting the sampling event (this document).

Field Activities and Findings

Preparatory Activities

MFA completed the following preparatory activities prior to conducting field activities on the Site:

DEQ and EPA Coordination Meeting. MFA attended several meetings with DEQ and attended one meeting with EPA staff to discuss the specific needs of the sampling event and specific laboratory requirements when utilizing EPA laboratory resources.

Laboratory Coordination, Communication, and Sample Container Preparation. Based on discussions with DEQ, MFA was directed to coordinate the sample analysis with two laboratories. Samples analyzed for VOCs would be submitted to Pace National and samples analyzed for PFAS compounds would be submitted to EPA's Manchester Laboratory. Sample containers, coolers, and shipping costs for PFAS analysis were not provided by EPA's Manchester Laboratory, so supplies were purchased from commercial sources.

Subcontractor Procurement. A subcontractor was competitively procured for IDW hauling and disposal. After completion of the procurement and during awarding, the initially selected subcontractor (WasteXpress) did not respond to communications and with DEQ concurrence the solicitation was awarded to the second ranking respondent (ACTenviro).

Site Health and Safety Plan. MFA prepared a site-specific health and safety plan (HASP) for the performance of these sampling activities. The HASP was prepared in general accordance with the Occupational Safety and Health Act and Oregon Administrative Rules. A copy of the HASP was submitted to DEQ and maintained on site for use by MFA staff during the field activities.

Preliminary Site Visit and Assessing Well Access. During communications with PWB, it was determined that MFA personnel should visit each of the wells in advance of the sampling event to assess the safety and access at each monitoring location. During this site visit, it was determined that one of the proposed sample locations (Well TG-8) was too close to an intersection with a major thoroughfare that has high levels of traffic. Based on communications about the safety concerns and traffic controls that would be required, PWB and DEQ determined that a substitute well (TG-5; Figure 3) could be sampled safety in the same geographic vicinity and target depth. Well TG-5 is approximately 2,200 feet west of TG-8.

Site Access, Work Notification, and Right-of-Way Permitting. MFA coordinated Site access and event timing with PWB, Portland Bureau of Transportation (PBOT), TriMet, DEQ, and both laboratories. MFA determined that a number of the wells were within PBOT jurisdiction and would require right-of-way permits. Permits were obtained and traffic controls were required.

Groundwater Sampling Activities

Groundwater monitoring was conducted in the CSSWF between April 9 and 16, 2025, from the 30 monitoring wells. Well locations are shown on Figures 2 through 4. Groundwater sampling was completed in accordance with MFA's standard operating procedures (SOP) 1, 9, 13 and 19, each of which were included in the work plan and are presented in Attachment A.

In accordance with SOP 9 and 19, the 30 monitoring wells were purged before they were sampled. Water quality parameter measurements were collected during low-flow purging with a flow-through cell and an in-line, multiprobe meter at approximately three-minute intervals. Water levels were also measured during purging to monitor drawdown in accordance with SOP 13. Parameter measurements recorded during purging included purge volume, purge flow rate, water level, temperature, specific conductivity, dissolved oxygen, pH, oxygen reduction potential, and turbidity. Once the monitoring parameters stabilized, sampling was conducted using a bladder pump with disposable high-density polyethylene (HDPE). Groundwater parameters were recorded on the Field Sampling Data Sheets (see Attachment B). Table 1 presents summary of the wells sampled, water levels, and final monitoring parameters.

Three wells required modifications to the sampling plan. The three wells each had a size limitation that prevented the use of MFA's bladder pump. In location TS-6, an obstruction or other debris prevented the pump from reaching the screened interval. PWB has a dedicated bladder pump for the well that was subsequently used to collect the sample. Please note that the type of tubing is not known for this well. In locations CRS-1d and CRS-1s, MFA staff discovered that a small diameter well casing was installed that prevented the use of a bladder pump. Due to the target sample depth, a Waterra pump was selected. All materials used for the Waterra pump foot and tubing was HDPE and confirmed with the manufacturer to be PFAS-free.

MFA sourced PFAS-free sampling containers from Eurofins Environment Testing of Sacramento, California. Other sample containers were provided by Pace National. Samples were collected directly into laboratory-source containers which were filled, capped, labeled, and preserved consistent with method requirements. The sample bottles were then transferred to a cooler chilled with ice. Samples were separated into coolers to the appropriate laboratory prior to shipment. PFAS samples were shipped overnight to EPA's Manchester Laboratory and VOCs to Pace National. Each cooler shipped to the laboratory contained a trip blank. Samples were maintained under standard chain-of-custody procedures. Consistent with the quality assurance and quality control (QA/QC) requirements stated in the work plan, MFA collected rinsate blanks from the reusable equipment (e.g., water level probe, bladder pump) used during the sampling event. Reusable sampling equipment was decontaminated between each well in accordance with SOP 1. Duplicate samples were collected and submitted for analysis. The QA/QC samples are detailed in Table 2.

Groundwater samples were analyzed for:

- VOCs by EPA Method 8260.
- PFAS by EPA Method 1633.

Investigation-Derived Waste Disposal

Wastes generated during the investigation activities consisted of decontamination and purged groundwater from the sampling event. The waste was placed into labeled Oregon Department of Transportation approved 55-gallon drums. The two drums were profiled for disposal and removed from the Site on June 18, 2025 for off-site disposal at US Ecology in Grand View, Idaho. Disposable sampling equipment and personal protective equipment was disposed of as solid waste.

Attachments

Limitations

Figures

Tables

A—Standard Operating Procedures

B—Field Sampling Data Sheets

Limitations

The services undertaken in completing this technical memorandum were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This technical memorandum is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this technical memorandum apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this technical memorandum.

Figures

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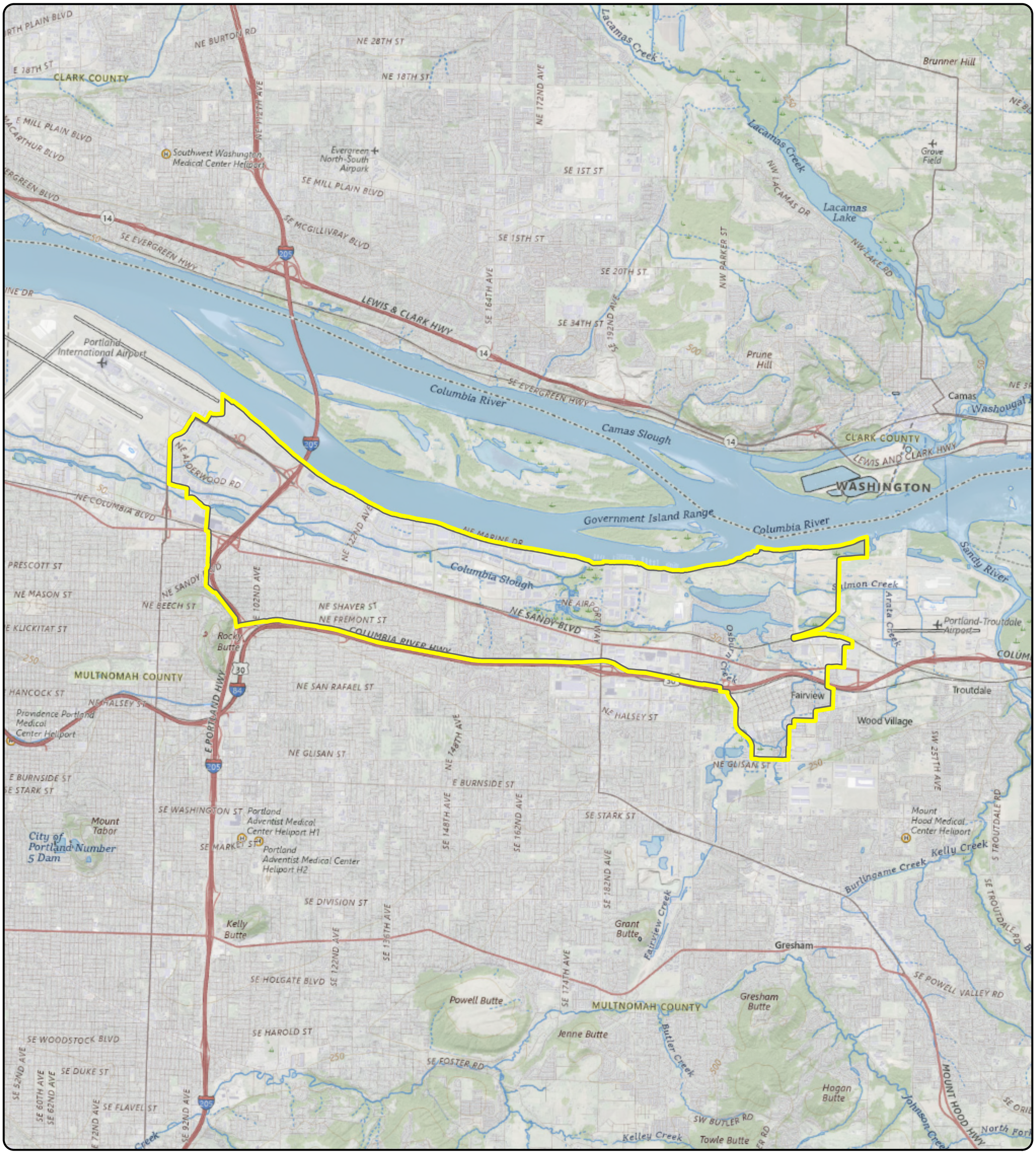

Notes
U.S. Geological Survey 7.5-minute topographic quadrangle: Mount Tabor and Camas.

Data Source
Property boundary obtained from Multnomah County and well field boundary provided by Portland Water Bureau.

Legend

Columbia South Shore Well Well Field Boundary

Figure 1
Site Location

Portland Water Bureau Groundwater Sampling
Oregon Department of Environmental Quality
Portland, Oregon

0 8,000
Feet

MAUL FOSTER ALONGI
p. 971 544 2139 | www.maulfoster.com

Path: X:\0_MFA_Projects\M0785.36\001\Pro\M0785_36_001.aprx\Fig 1 Property Location
Print Date: 5/5/2025
Reviewed By:
Produced By: giaravata
Project: M0785.36.001

Figure 2
Columbia South Shore Well Field Wells (West)

Portland Water Bureau
Groundwater Well Sampling
Oregon Department of Environmental Quality
Portland, Oregon

Legend

Monitoring Well

TS-6
CRS-2
CRS-1s
CRS-1d
TG-12s
TG-12i
TG-12-d
TG-11
CU1-1
TG-9s
TG-9i
TG-9d
WWF-2
TG-7
PRMW-1
PRMW-2

NE Marine Dr
NE Airport Way
Columbia Slough
NE 102nd Ave
NE 122nd Ave
Parkrose
Argay
Argay Park
Columbia Slough Natural Area
Luuwit View
205
30

Fisher's Landing
Government Island State Recreation Area
SW 6th Ave
14
Wilkes
Russell
Glenfair

0 850
Feet

Data Sources
Basemap obtained from Esri.

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Project: M0785.36.001

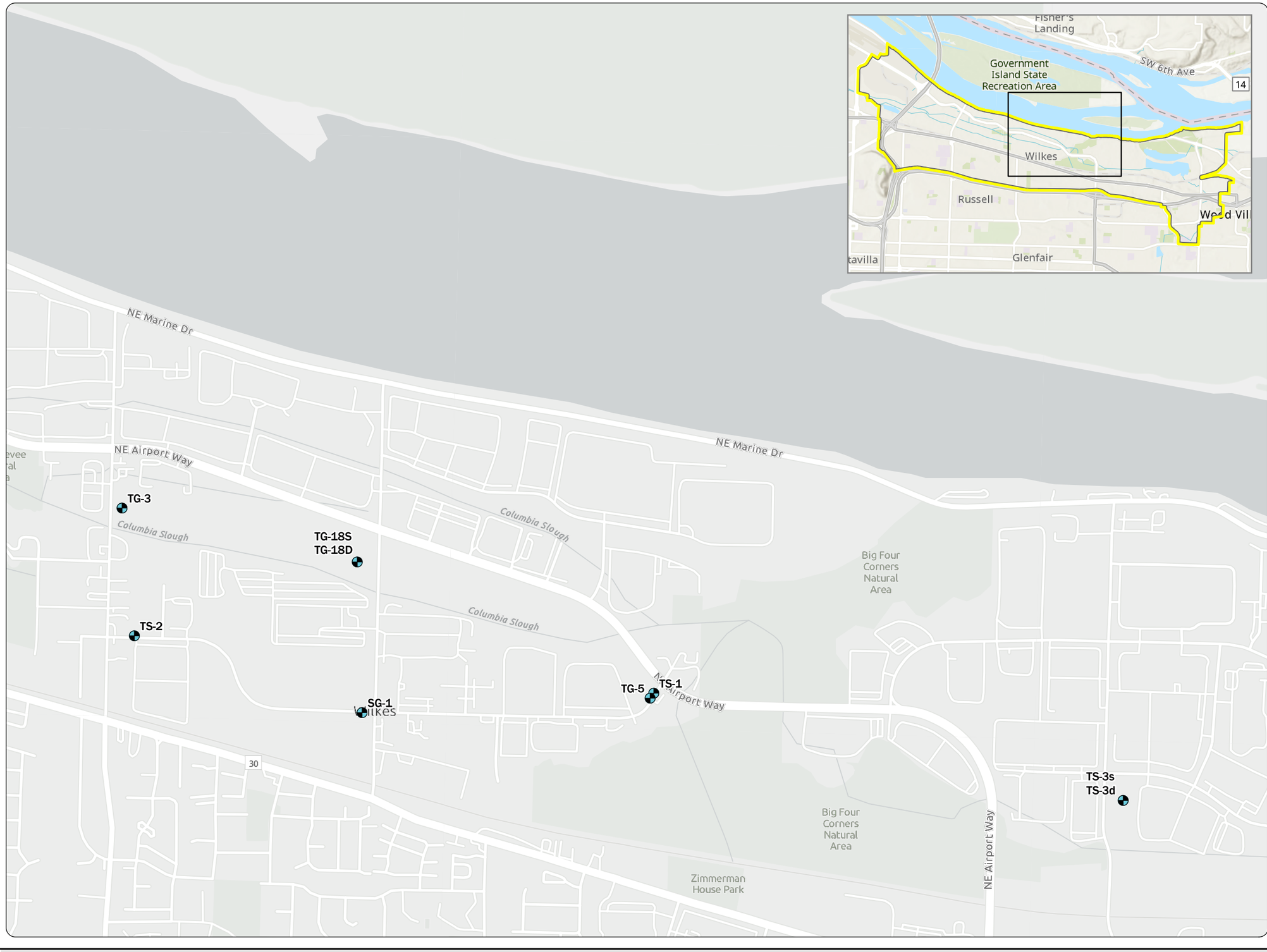

Figure 3
Columbia South Shore Well Field Wells (Middle)

Portland Water Bureau
Groundwater Well Sampling
Oregon Department of Environmental Quality
Portland, Oregon

Legend

- Monitoring Well

0 850
Feet

Data Sources
Basemap obtained from Esri.

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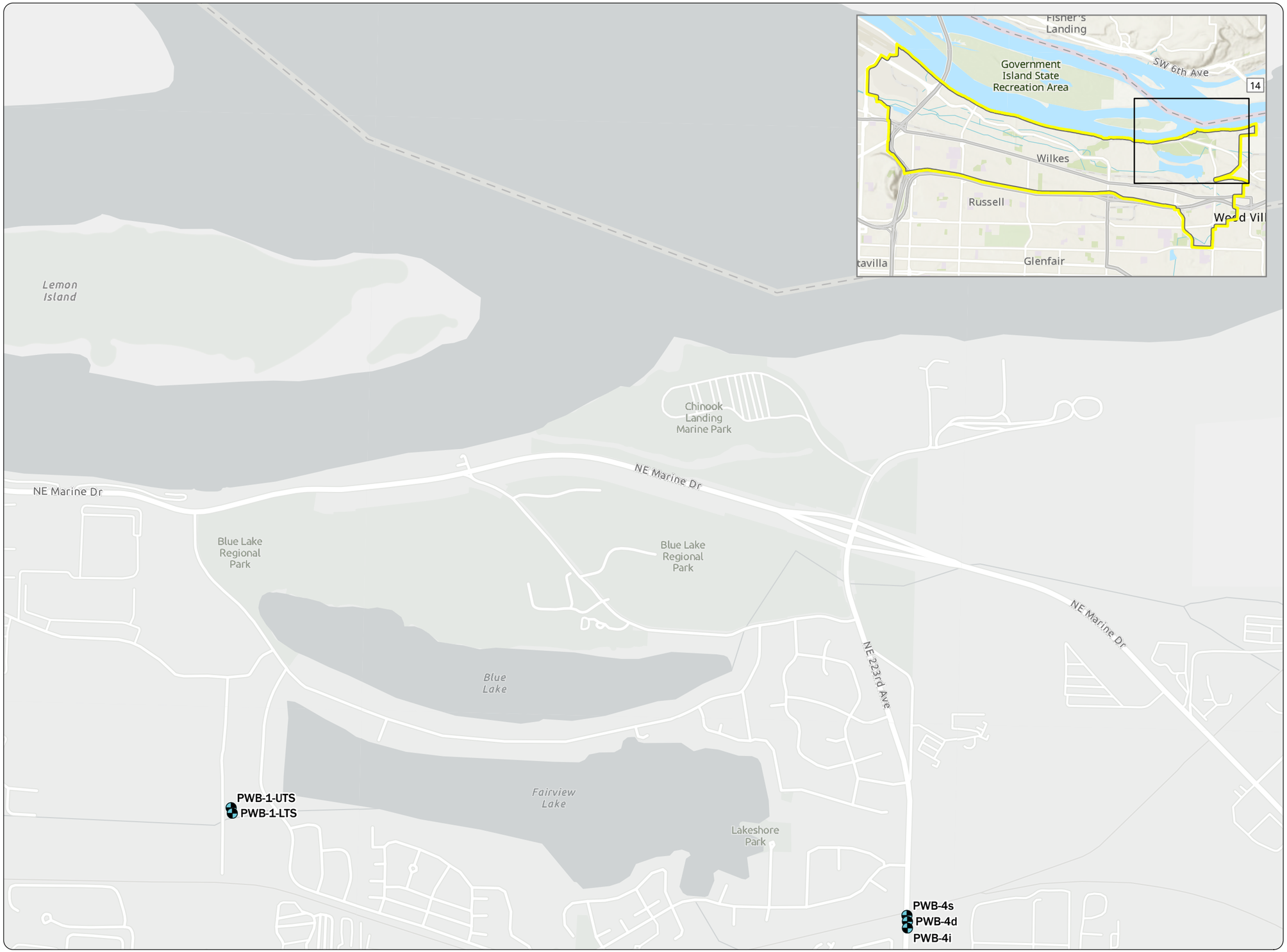
Figure 4
Columbia South Shore Well Field Wells (East)

Portland Water Bureau
Groundwater Well Sampling
Oregon Department of Environmental Quality
Portland, Oregon



Legend

- Monitoring Well

0 850
Feet

Data Sources
Basemap obtained from Esri.

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Print Date: 5/5/2025
Reviewed By:
Produced By: glaravata
Project: M0785.36.001

Tables

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Table 1
Summary of Groundwater Samples and Final Water Quality Parameters
Portland Water Bureau Groundwater Well Sampling
Oregon Department of Environmental Quality

Well ID	Sample ID	Sample Date	Initial Depth to Water (ft bgs)	Sample Depth (ft bgs)	Final Parameters					
					pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
					Standard Unit	°C	uS/cm	mg/L	mV	NTU
CU1-1	25154950	4/9/2025	9.07	281	7.82	14.2	243	0.38	-131.1	22.1
TS-6	25154951	4/9/2025	1.41	375	8.38	13.4	175.2	0.22	-108.5	10.4
PRMW-1	25154952	4/9/2025	67.39	95	6.64	13.9	214	7.43	57.6	0.71
TG-3	25154953	4/10/2025	2.55	140	6.76	13	212.9	5.06	92	20.1
PWB-4i	25154954	4/10/2025	12.59	125	11.26	13.2	349.8	5.1	21.9	52.2
PWB-4d	25154955	4/10/2025	14.13	200	11.53	13.6	665	4.44	-21.5	4.5
PWB-4s	25154956	4/10/2025	10.12	50	8.55	13.9	237.7	0.52	25.9	4.38
TG-11	25154957	4/10/2025	7.22	73	6.97	14.3	332.7	0.86	-104.1	2.02
TG-9s	25154958	4/10/2025	10.00	56	6.79	12.9	229	2.78	14.3	40.8
TS-1	25154960	4/11/2025	14.21	253	8.28	13.8	273	5.54	33	42.5
TG-5	25154961	4/11/2025	19.65	105	7.85	14	255.4	0.28	20.9	190
TS-2	25154962	4/11/2025	1.90	313	8.03	12.8	262.9	0.46	39.6	5.55
TG-9i	25164963	4/14/2025	9.91	112	7.59	13	388.6	0.28	125.1	0.57
TG-9i (duplicate)	25164964	4/14/2025								
TG-9d	25164965	4/14/2025	10.67	231	8.08	13.2	233.6	0.38	-31	1.86
PRMW-2	25164966	4/14/2025	110.14	134	6.6	14.8	210.2	8.02	52.2	0.39
TG-3s	25164967	4/14/2025	6.35	205	8.33	13.7	248.8	0.23	-52.9	2.34
TG-3d	25164968	4/14/2025	6.32	253	8.22	13.9	233.2	0.26	-62.3	13.2
TG-12s	25164969	4/14/2025	5.12	81	6.98	15	350.4	0.17	-120.5	0.72
TG-12i	25164970	4/14/2025	5.67	147	7.59	115.5	279	0.16	-83.2	8.84
TG-12d	25164971	4/14/2025	5.56	150	8.07	15.1	345.2	0.23	-134.9	4.59

Table 1
Summary of Groundwater Samples and Final Water Quality Parameters
Portland Water Bureau Groundwater Well Sampling
Oregon Department of Environmental Quality

Well ID	Sample ID	Sample Date	Initial Depth to Water (ft bgs)	Sample Depth (ft bgs)	Final Parameters					
					pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
					Standard Unit	°C	uS/cm	mg/L	mV	NTU
CRS-2	25164972	4/15/2025	7.34	240	7.63	13.3	321	0.39	-111.4	12
CRS-2 (duplicate)	25164973	4/15/2025								
CRS-1d	25164974	4/15/2025	6.13	220	6.59	15.7	105.5	2.48	-40.7	92.6
CRS-1s	25164975	4/15/2025	6.15	123	7.18	15.9	531.1	2.56	-106	28.5
TG-7	25164976	4/15/2025	11.77	160	9.36	13.8	295.5	0.2	-59.1	1.99
WWF-2	25164977	4/15/2025	7.63	25	6.67	13	244.1	7.75	14	1.79
SG-1	25164979	4/16/2025	9.78	416	8.24	12.4	251.7	0.53	-44.8	2.24
TG-18s	25164981	4/16/2025	5.95	50	6.53	13.9	195.2	6.51	36.5	1.54
TG-18d	25164982	4/16/2025	6.09	105	7.37	13.7	279.3	0.38	12.8	0.3
PWB-1-LTS	25164983	4/16/2025	4.00	121	8.72	14.5	290.6	0.25	-32.4	8.41
PWB-1-UTS	25164984	4/16/2025	4.05	74.5	9.1	14.8	278.5	1.29	-90	1.86

Notes

°C = degrees celsius

ft bgs = feet below ground surface.

mg/L = milligrams per liter.

mV = millivolt.

NTU = nephelometric turbidity unit.

uS/cm = microsiemens per centimeter.

Table 2
Summary of Quality Assurance and Quality Control Samples
Portland Water Bureau Groundwater Well Sampling
Oregon Department of Environmental Quality

Sample ID	Sample Date	Information
Trip Blanks		
25154959	4/10/2025	Trip Blank Shipment 1
25164985	4/14/2025	Trip Blank Shipment 2 (Cooler 1)
25164986	4/15/2025	Trip Blank Shipment 2 (Cooler 2)
Field Duplciate Samples		
25164964	4/14/2025	Duplicate of TG-9i (Sample ID 25164963)
25164973	4/15/2025	Duplicate of CRS-2 (Sample ID 25164972)
Equipment Blank		
25164978	4/15/2025	Equipment Blank 1
25164980	4/16/2025	Equipment Blank 2

Attachment A

Standard Operating Procedures

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Standard Operating Procedure

Decontamination of Field Equipment

SOP Number: 1
Date: 02/24/2025
Revision Number: 0.2

Scope and Application

This standard operating procedure (SOP) describes the decontamination procedure for field equipment that may come in contact with contaminated media and that Maul Foster & Alongi, Inc. (MFA) staff may reuse at multiple sample locations or sites. Decontamination is performed to reduce the potential for cross-contamination of samples that will be collected with multiuse equipment and that will undergo physical or chemical analyses. Other equipment that is multiuse—not used specifically for sample collection (e.g., water level meter, pump used for well development)—also requires decontamination. Finally, decontamination is necessary to minimize the potential for MFA staff's exposure to chemicals.

Typically, decontamination is not necessary for field equipment that is disposable and intended to be used only once (e.g., disposable bailer). Additionally, this SOP does not apply to equipment used by subcontractors, such as drilling equipment. However, MFA staff should confirm that subcontractors are implementing appropriate decontamination procedures to minimize the potential for cross-contamination of samples or MFA staff's exposure to chemicals.

Equipment and Materials Required

The following materials are necessary for this procedure:

- Nonphosphate detergent solution (e.g., Alconox, Liquinox)
- Distilled and potable water
- Personal protective equipment (as specified in the site-specific health and safety plan)
- Buckets to contain rinsate, brushes, paper towels

Depending on the site conditions and the types of contaminants that may be present, the use of other decontamination materials, such as deionized water, methanol, hexane, or isopropyl alcohol, may be necessary. The need for other materials should be determined prior to fieldwork. The decontamination procedures using other materials should be described in a site-specific sampling and analysis plan (SAP).

Methodology

When the site-specific SAP specifies additional or different requirements for decontamination, it takes precedence over this SOP. In the absence of a SAP, the following procedures shall be used.

General Sampling Procedure:

1. Rinse the equipment with potable water to remove visible soil, petroleum sheen, or contamination.

2. Scrub the equipment with a brush and solution of distilled water and nonphosphate detergent.

3. Rinse the equipment with distilled water.

4. Allow equipment to air dry or dry it with clean paper towels.

5. At all times, ensure that the decontaminated equipment is stored so as to prevent it from becoming contaminated while not in use. Depending on the size of the equipment, it can be wrapped with new aluminum foil or placed in a new plastic bag.

Rinsate Storage:

All fluids resulting from equipment decontamination shall initially be contained in a bucket and then transferred to a Department of Transportation-approved container (e.g., 55-gallon drum) stored on site at a location that does not interfere with on-site activities (e.g., vehicle traffic, pedestrian areas). Place a label on each container and include the following information:

- The date on which fluids were placed in the container
- Contents (e.g., “water from equipment decontamination”)
- Contact information, including MFA staff or client phone number

Note that labels on containers exposed to sunlight or precipitation are prone to fading. Use a waterproof, indelible ink pen (e.g., Sharpie®) whenever possible. In the field notebook, keep a detailed inventory of all containers, including the number of containers, the approximate quantity of liquids generated, and a description of the source of the fluids. Provide this information to the MFA project manager. For future reference, take photographs of (1) each drum label, (2) the drum(s), and (3) the drum storage vicinity on site.

Note that some clients and site owners have specific requirements for labeling and storage of containers. The requirements should be determined in advance of the fieldwork.

Standard Operating Procedure

Low-Flow Groundwater Sampling

SOP Number: 9
Date: 07/25/2023
Revision Number: 0.3

Scope and Application

This standard operating procedure (SOP) describes use of the low-flow sampling method for collection of reconnaissance groundwater samples from borings and groundwater samples from monitoring wells. The method uses low pumping rates during purging and sample collection to minimize water-level drawdown and hydraulic stress at the well-aquifer interface.

Equipment and Materials Required

The following materials are necessary for this procedure:

- Personal protective equipment (as specified in the health and safety plan)
- Water quality meter (e.g., Oakton, YSI Inc. multiparameter meter)
- Turbidity meter
- Water-level meter
- Peristaltic pump and tubing
- Laboratory-supplied sample containers
- Laboratory chain-of-custody form and cooler with ice
- Filter if dissolved analyses will be performed
- Well construction logs documenting the screen depth and interval for all wells to be sampled
- Equipment decontamination supplies if sampling equipment will be reused between sample locations (see SOP 1 for equipment decontamination procedures)
- 5-gallon buckets with lids
- Department of Transportation-approved storage containers (e.g., drums, totes)
- Groundwater field sampling datasheet and notebook

Methodology

When the project-specific sampling and analysis plan (SAP) provides additional or different requirements for low-flow groundwater sampling, it takes precedence over this SOP. In the absence of a SAP, the procedures in this SOP shall be used.

General Sampling Procedure:

Water Level Measurement

- Water-level measurement procedures are described in detail in SOP 13.

- Open the well cap to allow the water level to equilibrate (approximately ten minutes).
- Measure the water level in the well, using an electronic water-level meter to the nearest 0.01 foot to determine the depth to groundwater below the top of the well casing.
- If light nonaqueous-phase liquid (LNAPL)is present (typically indicated by a dark, oily sheen on the top of the water level meter), discuss with the MFA project manager how to proceed.

Purging

- If the water level is above the top of the well screen, place the end of the sample tubing in the middle of the well screen interval. If the water level is below the top of the screen, place the end of the sample tubing at the midpoint between the water level and the bottom of the well screen.
- Typical low-flow sampling pumping rates range from 0.1 to 0.5 liters per minute, depending on the hydrogeologic characteristics at the site. The objective of the rate selected is to minimize excessive drawdown (<0.3 feet) of the water level.
- Measure water quality parameters (dissolved oxygen, pH, electrical conductivity, turbidity, and temperature) using a flow-through cell connected to the discharge end of the peristaltic pump tubing. Purging will be considered complete when the water quality parameters stabilize per the following for three consecutive readings taken over 3-minute intervals (consistent with EPA guidance)[1]:

  Turbidity (10% for values greater than 5 NTU; if three Turbidity values are less than 5 NTU, consider the values as stabilized),
  Dissolved Oxygen (10% for values greater than 0.5 mg/L, if three Dissolved Oxygen values are less than 0.5 mg/L, consider the values as stabilized),
  Specific Conductance (3%),
  Temperature (3%),
  pH (± 0.1 unit),
  Oxidation/Reduction Potential (±10 millivolts).

- Document the purge procedures, including pumping rates, water quality parameter measurements, and the water level during purging, on the groundwater field sampling datasheet.
- Place purge water in Department of Transportation-approved containers (e.g., 55-gallon drum) stored on site. See SOP 1 for drum storage, labeling, and documentation procedures.

Sample Collection

- Following the purging process, collect groundwater samples in laboratory-supplied containers.
- Confirm the laboratory analytical methods and sample container requirement with the MFA project manager or project chemist. If analysis for gasoline-range petroleum hydrocarbons or volatile organic compounds (VOCs) is proposed, fill the sample containers for gasoline and VOC analysis before filling sample containers for other analytical methods. Sample containers for gasoline and VOC analysis shall be filled to capacity without overfilling and capped so that no headspace or air bubbles remain in the container.

[1] EPA. 2017. Low stress (low flow) purging and sampling procedure for the collection of groundwater samples from monitoring wells. September 19.

Low Yield (Alternate Method)

- If drawdown of the water table cannot be avoided by reducing the pumping rate, and the well goes dry during purging, discontinue pumping and water quality parameter measurements.
- Collect the groundwater sample after the water level above the well bottom recovers to 90 percent of the prepurge water level. For example, if the water level was 10 feet above the well bottom before purging, begin sampling when the water level has recovered to 9 feet or more above the well bottom.
- If the water column volume is insufficient to meet the sample volume requirement, allow the water level to again recover to 90 percent before continuing sampling. Repeat this procedure until all sample containers are filled.

Standard Operating Procedure

Monitoring Well—Water Elevation

SOP Number: 13
Date: 03/09/2021
Revision Number: 0.1

Scope and Application

This standard operating procedure (SOP) describes the methods for obtaining groundwater level measurements and light nonaqueous-phase liquid (LNAPL) measurements from monitoring wells. Measurement may be collected as an independent event or in conjunction with groundwater sampling or sampling of removed LNAPL.

Equipment and Materials Required

The following materials are necessary for this procedure:

- Personal protective equipment (as specified in the health and safety plan)
- Equipment decontamination supplies if equipment will be reused between well locations (see SOP 1 for equipment decontamination procedures)
- Field notebook
- Water-level meter or oil/water interface probe if water levels and LNAPL levels will be measured
- Bailers or tape/paste to confirm LNAPL detections if required; see SOP 10 for procedures for managing LNAPL when removing LNAPL from a well

Methodology

When the project-specific sampling and analysis plan (SAP) provides additional or different requirements for water-level and LNAPL measurements, it takes precedence over this SOP. In the absence of a SAP, the procedures in this SOP shall be used.

General Sampling Procedure:

Review well construction details and historical groundwater and LNAPL levels and thicknesses if available.

During groundwater sampling events, measurements should be collected before, during, and after purging and sampling. During purging and low-flow sampling, water-level measurements are conducted to ensure that drawdown is not occurring. Low-flow sampling methods are described in SOP 9. The following procedures should be followed when collecting groundwater-level and LNAPL measurements from wells.

Water Level Measurement

1. Test the water-level meter to ensure proper instrument response. This can be accomplished by immersing the probe tip in a small container of water.
2. Open the well cover and cap and allow the water level to equilibrate with atmospheric pressure for several minutes so that a static water level is attained. Audible air movement into or out of

the well upon loosening of the well cap is an indication that the water level is not in equilibrium with atmospheric pressure.

3. Locate the measurement reference point at the top of the well casing. Typically, this is a small notch in the casing or a point marked with a pen. If no measure point is present, measure the water level from the north side of the casing and note the result in the field notebook.
4. Lower the water-level meter probe into the well casing until the probe signal indicates that water has been contacted.
5. Observe the depth-to-water (DTW) reading from the measurement reference point at the top of the well casing to the nearest 0.01 foot. Over the course of about a minute, raise and re-lower the probe and observe the resulting DTW reading. If the reading remains unchanged to within 0.01 foot, this is an indication that the water level has equilibrated with atmospheric pressure; the reading can then be recorded in the field notebook as the static water level reading. If the reading changes, allow more time for the water level to become static.
6. If the work scope or SAP requires measurement of the depth-to-bottom (DTB), lower the probe to the bottom of the well and record the DTB reading from the reference point to the nearest 0.01 foot.
7. Remove the probe and decontaminate the probe and the portion of the probe tape inserted into the well casing.

Water Level and LNAPL Measurement

1. Repeat above steps 1 through 7.
2. Lower the interface probe into the well casing until the probe signal indicates that LNAPL has been contacted. Typically, the interface probe will signal by a repeating beep when LNAPL is present. A steady signal indicates that LNAPL is absent and that the probe is recording the DTW.
3. Observe the LNAPL reading as described in step 5 above until a static reading to the nearest 0.01 foot is achieved, and record the reading in the field notebook.
4. Lower the probe until a steady signal indicates that water has been contacted. Observe the water-level reading as described in step 5 above to confirm a static water level, and record the reading in the field notebook.
5. If LNAPL is detected in a well with no prior history of LNAPL presence, or the LNAPL thickness is greater than in prior observations, verify the presence and thickness using an alternative technique (e.g., bailer, tape, and water/petroleum colorimetric paste). See SOP 10 for procedures for managing LNAPL when removing LNAPL from a well.
6. Remove the interface probe and decontaminate the probe and the portion of the probe tape inserted into the well casing.

Standard Operating Procedure

Sample Collection for PFAS Analysis

SOP Number: 19
Date: 08/17/2023
Revision Number: 0.1

Scope and Application

This standard operating procedure (SOP) describes modifications to the methods used for obtaining soil, groundwater, stormwater, and sediment samples (SOPs 04, 09, 14, and 15, respectively) for chemical analysis of per- and polyfluoroalkyl substances (PFAS). The ubiquitous nature of PFAS and low screening/cleanup levels require special care to ensure that no cross-contamination from other sources occurs during sampling.

Equipment and Materials Required

Prior to conducting the sampling event, field equipment and supplies should be screened to identify any items that may pose a cross-contamination threat. Review safety data sheets, ingredients lists, or consult with the equipment manufacturer to ensure that the equipment and supplies do not contain PFAS.

Sampling equipment:

- Use high-density polyethylene (HDPE) and/or silicone tubing. Low-density polyethylene (LDPE) tubing should not be used. Tubing composed of or lined with polyvinylidene fluoride (PVDF), and polytetrafluoroethylene (PTFE or Teflon) should never be used.
- Ensure bladder pumps are PFAS-free. Many bladder pumps use PTFE bladders and valves that should be avoided.
- Ensure bailers and retrieval string are PFAS-free. Do not use bailers constructed from LDPE or fluorinated ethylene propylene (FEP). Undyed nylon is preferred for retrieval string.
- Ensure that submersible pumps are PFAS-free. The seals, pump body, and wire insulation may be composed of PTFE, PVDF, polychlorotrifluoroethylene (PCTFE), ethylene-tetrafluoroethylene (ETFE), or FEP.
- Ensure field notebooks, papers, clipboards, and writing utensils are PFAS-free. Waterproof paper, permanent markers, and plastic clipboards may contain PFAS. Regular/thick size markers (Sharpie or otherwise) should not be used. Fine and Ultra-Fine point Sharpie markers are acceptable so long as gloves are changed after their use.
- Work with subcontractors to ensure drilling equipment, core liners, well casings, and well screens are PFAS-free. Verify that the subcontractor decontaminates the drill casing prior to its initial use and following collection of each core using PFAS-free water in a location separate from the drilling location.
- Sample homogenization, if required, should be completed in a clean stainless-steel bowl. Resealable plastic bags should not be used in contact with the sample material.

Sample Containers and Reagents:

- Use PFAS-free sample bottles provided by the laboratory. Polypropylene or HDPE bottles with unlined caps are typically used. Do not use sample containers with Teflon lined lids.
- Use laboratory supplied, verified, deionized water when preparing field and equipment blanks.

Equipment Decontamination Supplies:

See SOP 01 for equipment decontamination procedures.

- Use laboratory supplied, PFAS-free deionized water for equipment decontamination.
- Ensure that the detergents or soaps used in decontamination do not contain fluoro-surfactants in the ingredients list. The commonly used detergents Alconox and Liquinox are acceptable for use[1] as they do not contain PFAS ingredients, nor are they exposed to PFAS during the manufacturing process.[2]
- Spray bottles used for equipment decontamination should be emptied before being stored, and new detergent and laboratory supplied, PFAS-free deionized water should be added at the start of the field event.
- Ensure that paper towels used during decontamination are PFAS-free.

Clothing and Personal Protective Equipment:

The safety of staff should never be compromised for the purpose of preventing PFAS cross-contamination. If PFAS-free alternatives to sun and biological protection or personal protective equipment (PPE) listed below are not available, use what is available and record the items used in the field notes.

- Use powderless nitrile gloves. Do not use latex gloves.
- Clothing should be well-laundered without the use of fabric softener. Do not wear new, unwashed clothing or clothing treated for water, stain, dirt, insect, or ultraviolet protection including coated Tyvek.
- Wear boots made from polyurethane or polyvinyl chloride (PVC). Avoid leather and treated fabrics.
- Rain gear, if worn, should be made with polyurethane, PVC, rubber, neoprene, or wax-coated fabric. Do not use Gore-Tex or Scotchgard rain gear.
- Review the ingredients lists for sunscreens, cosmetics, shampoo, insect repellents, and other personal care products to ensure that they do not contain PFAS. Do not apply sunscreens, insect repellents, or other personal care products near the sample collection area, or while wearing PPE that will be worn during sample collection.

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[1] Michigan Department of Environmental Quality. 2018. *General PFAS Sampling Guidance.* October 16.

[2] Alconox Inc. 2019. "Are there any PFAS, PFOA, or PFOS in Alconox Inc. Critical Cleaners?" TechNotes Critical Cleaning Advice from Alconox Inc. White Plains, NY. November 4. Accessed September 6, 2023. https://technotes.alconox.com/industry/environmental/pfoa-pfos-pfas-alconox-cleaners/.

Methodology

When the site-specific sampling and analysis plan (SAP) specifies additional or different requirements for soil or groundwater sampling, it takes precedence over this SOP. In the absence of a SAP, the procedures in this SOP shall be used.

Eating, staging, and sampling areas should be separated to help avoid PFAS cross-contamination. Due to the high risk of cross-contamination, visitors should not be allowed in the sampling area.

Laboratory Analytical Considerations:

- The sample must be submitted to the laboratory and be prepared within holding times described by the analytical method to be used.
- Samples must be maintained at less than 4° ± 2°Celsius and protected from light until they are delivered to the laboratory.

General Sampling Procedure:

Sample collection should be conducted, if possible, in sequence from locations suspected to be least contaminated to locations suspected to be most contaminated. Staff will follow the sample collection procedures described for soil, groundwater, stormwater, and sediment sampling described in SOPs 04, 09, 14, and 15 with the following modifications. Low-flow methods are preferred for groundwater sample collection; however, other approaches may be used when measures are taken to minimize turbidity in the samples as specified in a project specific SAP.

- Wash hands and put on clean powderless nitrile gloves before commencing field activities.
- Decontaminate any dedicated equipment that may come in contact with the sample medium following the procedures in SOP 01 using laboratory supplied PFAS-free deionized water and fluoro-surfactant free detergent/soap.
- Change gloves for new clean gloves immediately prior to sample collection or handling sample equipment. Change gloves for new clean gloves whenever materials other than the PFAS sample container or sampling equipment are touched (including if sample containers for other analyses are touched).
- To avoid cross-contamination from the waterproof paper label, do not apply sample label to the sample container until after the container is filled and sealed.
- Keep sample containers sealed at all times and only open them during sample collection.
- Never place the sample container lid on any surface unless it is PFAS-free. The cap or lid must never be placed directly on the ground or upside down where it could collect airborne particulate matter.
- When collecting soil and sediment samples, fill the containers for volatile organic compounds (VOCs) analysis (see SOP 05) prior to collecting the material for PFAS analysis to avoid volatilization losses.[3] Put on new clean gloves before collecting the PFAS sample to avoid cross-contamination from the PTFE lid on the volatile organic analysis (VOA) vials.

[3] Washington State Department of Ecology, Toxics Cleanup Program. 2023. *Guidance for Investigating and Remediating PFAS Contamination in Washington State.* Publication No. 22-09-058. Olympia, WA. June.

- Fill the groundwater and surface water sample containers for PFAS analysis prior to the containers for other analyses to avoid cross-contamination from the PTFE lids on other sample containers.
- Once the sample container is filled and sealed, apply the sample label and fill it in with the relevant sample information. Then place the sample into a resealable plastic bag (e.g., Ziploc) and store it on water ice in a cooler. Chemical ice packs should not be used to cool PFAS samples.
- Avoid storing samples collected for PFAS with other sample containers that may have PFAS-containing lids such as VOA vials. Consider storing and shipping PFAS samples in a dedicated cooler separate from other sample containers.
- Follow method specific sample preservation, thermal storage, and holding times.

Attachment B

Field Sampling Data Sheets

MAUL FOSTER ALONGI

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
CU1-1	Monitoring	Stick-up		2.0	276 to 286	281

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*
04/09/2025	9:00	286		9.07		276.93	45.14

0.75" = 0.023 gal/ft
1" = 0.041 gal/ft
1.5" = 0.092 gal/ft
2" = 0.163 gal/ft
3" = 0.367 gal/ft
4" = 0.653 gal/ft
6" = 1.469 gal/ft
8" = 2.611 gal/ft

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	9:10	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
9:16	0.5	0.4	10.93	7.49	14.3	246	1.10	17.2	9.5
9:19	0.7	0.4	11.15	7.58	14.2	247	0.73	-33.6	9.5
9:22	0.9	0.4	11.37	7.64	14.1	246	0.65	-56.6	12.0
9:25	1.1	0.4	11.57	7.70	14.2	245	0.52	-85.4	14.0
9:28	1.3	0.4	11.56	7.76	14.2	244	0.45	-104.4	18.1
9:31	1.8	0.4	11.59	7.78	14.2	244	0.43	-113.4	26.6
9:34	2.0	0.4	11.61	7.80	14.1	244	0.40	-121.2	32.6
9:37	2.3	0.4	11.64	7.81	14.1	243	0.38	-125.9	25.7
9:40	2.6	0.4	11.68	7.82	14.2	243	0.38	-131.1	22.1

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless.

General Comments

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25154950		
Sample Date	04/09/2025	Sample Time	9:40

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
TS-6	Monitoring	Stick-up		2.0	365 to 385	375

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)	
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*	
04/09/2025	13:27	417		1.41		415.59	67.74	

0.75" = 0.023 gal/ft
1" = 0.041 gal/ft
1.5" = 0.092 gal/ft
2" = 0.163 gal/ft
3" = 0.367 gal/ft
4" = 0.653 gal/ft
6" = 1.469 gal/ft
8" = 2.611 gal/ft

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	13:30	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
13:36	0.7	0.4	1.42	7.95	13.7	176.1	0.78	-13.4	6.55
13:39	1.1	0.4	1.42	8.31	13.6	175.4	0.33	-45.1	23.1
13:42	1.5	0.4	1.44	8.34	13.6	175.4	0.3	-54.1	26.9
13:45	1.7	0.4	1.58	8.35	14.5	175.4	0.28	-62.8	20.2
13:48	2	0.4	1.74	8.36	13.6	175.4	0.27	-74.4	17.1
13:51	2.35	0.4	1.9	8.36	13.5	175.4	0.25	-82.9	15.1
13:54	2.55	0.4	1.98	8.36	13.4	175.5	0.24	-92.3	14.1
13:57	2.9	0.4	2.06	8.37	13.4	175.5	0.23	-102.4	9.82
14:00	3.25	0.4	2.08	8.38	13.4	175.2	0.22	-108.5	10.4

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless.

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25154951		
Sample Date	4/9/2025	Sample Time	14:00

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

General Comments

Using PWB dedicated pump for ground water extraction. MFA PDX YSI number one to collect parameters.

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
PRMW-1	Monitoring	Flush-mount		2.0	85 to 105	95

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)	
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*	
04/09/2025	15:06	105		67.39		37.61	6.13	

0.75" = 0.023 gal/ft
1" = 0.041 gal/ft
1.5" = 0.092 gal/ft
2" = 0.163 gal/ft
3" = 0.367 gal/ft
4" = 0.653 gal/ft
6" = 1.469 gal/ft
8" = 2.611 gal/ft

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	15:30	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
15:36	0.2	0.3	67.39	6.77	14	219.5	8.04	76.4	5.92
15:39	0.35	0.3	67.18	6.68	13.8	217.7	7.47	71.3	2.4
15:42	0.5	0.3	67.25	6.67	13.7	216.5	7.72	66.8	1.56
15:45	0.75	0.3	67.28	6.67	13.6	215.5	7.38	58.4	0.51
15:48	1	0.3	67.35	6.65	13.9	214.7	7.74	57.8	0.42
15:51	1.2	0.3	67.36	6.64	13.9	214	7.43	57.6	0.71

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless

General Comments

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25154952		
Sample Date	04/09/2025	Sample Time	15:51

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
TG-3	Monitoring	Flush-mount		2.0	135 to 145	140

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*
04/10/2025	8:31	145		2.55		142.45	23.22

0.75" = 0.023 gal/ft
1" = 0.041 gal/ft
1.5" = 0.092 gal/ft
2" = 0.163 gal/ft
3" = 0.367 gal/ft
4" = 0.653 gal/ft
6" = 1.469 gal/ft
8" = 2.611 gal/ft

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	8:40	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
8:46	0.5	0.4	2.55	6.61	13	206.7	3.51	86.6	9.04
8:49	0.8	0.4	2.56	6.69	12.9	211.1	4.21	89.3	23.2
8:52	1.1	0.4	2.55	6.75	12.9	213	4.8	91.9	21.1
8:55	1.4	0.4	2.53	6.75	13	212.9	4.86	92	21.6
8:58	1.7	0.4	2.52	6.76	13	212.9	5.06	92	20.1

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless.

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25154953		
Sample Date	4/10/2025	Sample Time	8:58

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

General Comments

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
PWB-4i	Monitoring	Flush-mount		2.0	115 to 135	125

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)	
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*	*0.75" = 0.023 gal/ft* *1" = 0.041 gal/ft* *1.5" = 0.092 gal/ft* *2" = 0.163 gal/ft* *3" = 0.367 gal/ft* *4" = 0.653 gal/ft* *6" = 1.469 gal/ft* *8" = 2.611 gal/ft*
04/10/2025	10:15	135		12.59		122.41	19.95	

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	10:34	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
10:43	0.8	0.4	12.63	10.99	13.4	257.7	4.1	45.9	70.5
10:46	1	0.4	12.6	11.11	13.3	291.8	4.21	38.6	67
10:49	1.2	0.4	12.6	11.14	13.3	301.1	4.3	35.8	64.2
10:52	1.4	0.4	12.61	11.9	13.3	316.1	4.79	30.7	61.3
10:55	1.7	0.4	12.73	11.2	13.3	320.5	4.66	28.5	59.1
10:58	1.9	0.4	12.67	11.21	13.4	325.8	4.8	26.7	58.3
11:01	2.1	0.4	12.67	11.25	13.2	314.8	4.84	22.8	52.7
11:04	2.5	0.4	12.63	11.26	13.2	349.8	5.1	21.9	52.2

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Slightly turbid, brown.

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25154954		
Sample Date	4/10/2025	Sample Time	11:04

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

General Comments

Sample after 30 minutes purging without stabilization.

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
PWB-4d	Monitoring	Flush-mount		2.0	190 to 210	200

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)	
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*	*0.75" = 0.023 gal/ft* *1" = 0.041 gal/ft* *1.5" = 0.092 gal/ft* *2" = 0.163 gal/ft* *3" = 0.367 gal/ft* *4" = 0.653 gal/ft* *6" = 1.469 gal/ft* *8" = 2.611 gal/ft*
04/10/2025	11:36	210		14.13		195.87	31.93	

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	11:35	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
11:41	0.3	0.5	14.19	11.45	13.8	736	4.18	-2.1	15.8
11:44	0.7	0.5	14.19	11.48	13.9	718	4.3	-6.9	5.82
11:47	1.1	0.5	14.19	11.52	13.5	685	4.36	-14.9	5.33
11:50	1.5	0.5	14.19	11.54	13.5	676	4.48	-18.9	4.5
11:53	1.9	0.5	14.19	11.53	13.6	665	4.44	-21.5	4.5

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*	Clear, colorless

General Comments

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25154955		
Sample Date	4/10/2025	Sample Time	11:53

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
PWB-4s	Monitoring	Flush-mount		2.0	40 to 60	50

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)	
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*	
04/10/2025	13:05	60		10.12		49.88	8.13	

0.75" = 0.023 gal/ft
1" = 0.041 gal/ft
1.5" = 0.092 gal/ft
2" = 0.163 gal/ft
3" = 0.367 gal/ft
4" = 0.653 gal/ft
6" = 1.469 gal/ft
8" = 2.611 gal/ft

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	13:10	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
13:20	0.92	0.35	10.12	8.33	14	236.5	1.15	85.2	9.2
13:23	1.20	0.35	10.12	8.46	13.9	239	1.02	67.6	5.28
13:26	1.48	0.35	10.12	8.54	13.9	238.4	0.74	46.7	5.16
13:29	1.76	0.35	10.12	8.55	13.9	238.1	0.67	41.3	4.45
13:32	2.04	0.35	10.12	8.55	13.8	238.1	0.61	34.3	5.2
13:35	2.32	0.35	10.12	8.54	14	237.7	0.55	29.4	5.62
13:38	2.60	0.35	10.12	8.55	13.9	237.7	0.52	25.9	4.38

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless.

General Comments

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25154956		
Sample Date	4/10/2025	Sample Time	13:38

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
TG-11	Monitoring	Stick-up		2.0	68 to 78	73

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*
04/10/2025	14:20	80		7.22		72.78	11.86

0.75" = 0.023 gal/ft
1" = 0.041 gal/ft
1.5" = 0.092 gal/ft
2" = 0.163 gal/ft
3" = 0.367 gal/ft
4" = 0.653 gal/ft
6" = 1.469 gal/ft
8" = 2.611 gal/ft

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*							
Purge Start Time	14:40:00 PM	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*	

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
14:54	0.6	0.3	7.22	6.95	14.2	333	0.83	-105.7	4.0
14:57	0.9	0.3	7.22	6.94	14.3	332.6	0.84	-104	3.02
15:00	1.3	0.3	7.22	6.94	14.2	332.3	0.84	-104.3	2.82
15:03	1.7	0.3	7.22	6.97	14.3	332.7	0.86	-104.1	2.02

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear; colorless; no odor; no sheen.

General Comments

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25154957		
Sample Date	4/10/2025	Sample Time	1503

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
TG-9s	Monitoring	Stick-up		2.0	51 to 61	56

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*
04/10/2025	15:35	61		10.00		51.00	8.31

0.75" = 0.023 gal/ft
1" = 0.041 gal/ft
1.5" = 0.092 gal/ft
2" = 0.163 gal/ft
3" = 0.367 gal/ft
4" = 0.653 gal/ft
6" = 1.469 gal/ft
8" = 2.611 gal/ft

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	15:43	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
15:49	0.3	0.3	10.00	6.99	12.9	235	2.10	-5.5	151.0
15:52	0.5	0.3	10.00	6.97	12.9	234	1.77	-5.4	168.0
15:55	0.7	0.3	10.00	6.97	12.9	234	1.84	-2.6	169.0
15:58	1.2	0.3	10.00	6.94	12.9	233	1.74	-1.6	128.0
16:01	1.4	0.3	10.00	6.91	12.9	232	1.94	0.3	82.2
16:04	1.5	0.3	10.03	6.87	12.9	231	2.29	4.9	86.0
16:07	1.7	0.3	10.00	6.80	12.9	230	2.42	7.9	50.6
16:10	2.0	0.3	10.03	6.78	12.9	229	2.52	12.5	41.9
16:13	2.2	0.3	10.00	6.79	12.9	229	2.78	14.3	40.8

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless.

General Comments

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25154958		
Sample Date	04/10/2025	Sample Time	16:13

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
TS-1	Monitoring	Flush-mount		2.0	248 to 258	253

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)	
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*	*0.75" = 0.023 gal/ft* *1" = 0.041 gal/ft* *1.5" = 0.092 gal/ft* *2" = 0.163 gal/ft* *3" = 0.367 gal/ft* *4" = 0.653 gal/ft* *6" = 1.469 gal/ft* *8" = 2.611 gal/ft*
04/11/2025	9:45	258		14.21		243.79	39.74	

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	10:12	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
10:18	0.2	0.35	14.25	7.96	13.8	304.4	7.58	84.9	38.5
10:21	0.4	0.35	14.25	7.88	13.8	294.5	7.09	78.6	69.5
10:24	0.7	0.35	14.25	8.03	13.8	286.5	6.76	71.1	92.2
10:27	1	0.35	14.25	8.05	13.8	285.6	6.64	67.3	90.9
10:30	1.3	0.35	14.25	8.1	13.8	283.4	6.48	62.4	86
10:33	1.5	0.35	14.25	8.14	13.8	281.4	6.33	58.4	73.9
10:36	1.7	0.35	14.25	8.2	13.8	277.7	6	48	64.3
10:39	1.9	0.35	14.25	8.24	13.8	275.4	5.79	40.3	51.2
10:42	2.1	0.35	14.25	8.28	13.8	273	5.54	33	42.5

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless.

General Comments

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25155500		
Sample Date	4/11/2025	Sample Time	10:42

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
TG-5	Monitoring	Flush-mount		2.0	100-110	105

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*
04/11/2025	12:05	125		19.65		105.35	17.17

0.75" = 0.023 gal/ft
1" = 0.041 gal/ft
1.5" = 0.092 gal/ft
2" = 0.163 gal/ft
3" = 0.367 gal/ft
4" = 0.653 gal/ft
6" = 1.469 gal/ft
8" = 2.611 gal/ft

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	12:34	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
12:49	1.8	0.45	20.25	7.86	14.1	256.5	0.34	27.2	989
12:52	2	0.45	20.14	7.86	14.1	256	0.34	26.5	579
12:55	2.25	0.45	20.15	7.86	14.2	255.6	0.3	23.9	344
12:58	2.5	0.45	20.14	7.86	14.1	255.5	0.29	23.6	290
13:01	2.75	0.45	20.14	7.86	14.1	255.3	0.29	22.3	214
13:04	3.24	0.45	20.14	7.85	14	255.4	0.28	20.9	190

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Turbid

General Comments

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25155501		
Sample Date	4/11/2025	Sample Time	13:04

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
TS-2	Monitoring	Flush-mount		2.0	308 to 318	313

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)	
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*	*0.75" = 0.023 gal/ft* *1" = 0.041 gal/ft* *1.5" = 0.092 gal/ft* *2" = 0.163 gal/ft* *3" = 0.367 gal/ft* *4" = 0.653 gal/ft* *6" = 1.469 gal/ft* *8" = 2.611 gal/ft*
04/11/2025	14:50	318		1.90		316.10	51.52	

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	1452	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
15:01	1	0.4	1.95	6.43	13	338	3.61	84.2	58.3
15:04	1.32	0.4	1.91	7.61	12.9	270.4	0.7	57.8	17.3
15:07	1.64	0.4	1.91	7.75	12.9	267.3	0.64	53.9	12.4
15:10	1.96	0.4	1.9	7.83	12.8	265.9	0.58	51.2	9.35
15:13	2.28	0.4	1.9	7.9	12.8	264.3	0.55	48.6	8.38
15:16	2.6	0.4	1.9	7.95	12.8	263.7	0.53	45.5	6.81
15:19	2.92	0.4	1.9	8	12.8	263	0.48	42.5	5.36
15:22	3.24	0.4	1.9	8.03	12.8	262.9	0.46	39.6	5.55

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless

General Comments

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25155502		
Sample Date	4/11/2025	Sample Time	15:22

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
TG-9i	Monitoring	Flush-mount		2.0	107 to 117	112

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*
04/14/2025	9:15	117		9.91		107.09	17.46

0.75" = 0.023 gal/ft
1" = 0.041 gal/ft
1.5" = 0.092 gal/ft
2" = 0.163 gal/ft
3" = 0.367 gal/ft
4" = 0.653 gal/ft
6" = 1.469 gal/ft
8" = 2.611 gal/ft

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*							
Purge Start Time	9:25	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*	
Time	**Cumulative Purge Volume**	**Flowrate**	**Water Level**	**pH**	**Temperature**	**Conductivity**	**Dissolved Oxygen**	**ORP**	**Turbidity**
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
9:40	2	0.4	10.38	7.58	13.1	388.3	0.3	131.1	0.72
9:43	2.15	0.4	10.42	7.58	13	388	0.28	129.5	0.79
9:46	2.3	0.4	10.38	7.59	13	388.6	0.28	125.1	0.57

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless.

General Comments

Duplicate collected (25164964).

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25164963		
Sample Date	4/14/2025	Sample Time	9:46

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
TG-9d	Monitoring	Flush-mount		2.0	226 to 236	231

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)	
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*	
04/14/2025	9:20	236		10.67		225.33	36.73	

0.75" = 0.023 gal/ft
1" = 0.041 gal/ft
1.5" = 0.092 gal/ft
2" = 0.163 gal/ft
3" = 0.367 gal/ft
4" = 0.653 gal/ft
6" = 1.469 gal/ft
8" = 2.611 gal/ft

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	10:00	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
10:15	2	0.4	11.14	8.06	13.2	233.2	0.39	-23.4	2.01
10:18	2.15	0.4	11.15	8.07	13.2	233.4	0.4	-26.4	1.61
10:21	2.3	0.4	11.16	8.08	13.2	233.6	0.38	-31	1.86

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless.

General Comments

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25164965		
Sample Date	4/14/2025	Sample Time	10:21

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
PRMW-2	Monitoring	Flush-mount		2.0	124 to 144	134

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)	
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*	*0.75" = 0.023 gal/ft* *1" = 0.041 gal/ft* *1.5" = 0.092 gal/ft* *2" = 0.163 gal/ft* *3" = 0.367 gal/ft* *4" = 0.653 gal/ft* *6" = 1.469 gal/ft* *8" = 2.611 gal/ft*
4/14/2025	11:36	144		110.14		33.86	5.51918	

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	11:50	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
12:05	0.8	0.25	110.05	6.64	15	218	8.14	43.8	0.99
12:08	1	0.25	110.05	6.61	14.7	210.2	7.95	50.4	0.57
12:11	1.2	0.25	110.05	6.61	14.7	210.2	8.37	50.9	0.44
12:14	1.4	0.25	110.05	6.6	14.8	210.2	8.02	52.2	0.39

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless

General Comments

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25164966		
Sample Date	4/14/2025	Sample Time	12:14

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
TG-3s	Monitoring	Flush-mount		2.0	195 to 215	205

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*
04/14/2025	13:08	215		6.35		208.65	34.01

0.75" = 0.023 gal/ft
1" = 0.041 gal/ft
1.5" = 0.092 gal/ft
2" = 0.163 gal/ft
3" = 0.367 gal/ft
4" = 0.653 gal/ft
6" = 1.469 gal/ft
8" = 2.611 gal/ft

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	13:20	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
13:35	1.5	0.35	6.45	8.32	13.7	248.8	0.26	-45.3	18.5
13:38	1.75	0.35	6.45	8.32	13.8	248.5	0.26	-45.4	14.4
13:41	2	0.35	6.45	8.33	13.7	248.8	0.25	-46.3	7.53
13:44	2.2	0.35	6.46	8.33	13.7	249.1	0.24	-47.6	4.9
13:47	2.4	0.35	6.46	8.33	13.7	248.1	0.23	-51.3	3.01
13:50	2.6	0.35	6.46	8.33	13.7	248.8	0.23	-52.9	2.34

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless

General Comments

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25164967		
Sample Date	4/14/2025	Sample Time	13:50

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
TG-3d	Monitoring	Flush-mount		2.0	243 to 263	253

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*
04/14/2025	13:05	264		6.32		257.68	42.00

0.75" = 0.023 gal/ft
1" = 0.041 gal/ft
1.5" = 0.092 gal/ft
2" = 0.163 gal/ft
3" = 0.367 gal/ft
4" = 0.653 gal/ft
6" = 1.469 gal/ft
8" = 2.611 gal/ft

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	1358	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
14:13	2	0.3	6.52	8.26	14	233.8	0.29	-44.1	439
14:16	2.2	0.3	6.52	8.24	14	232.4	0.29	-47.3	137
14:19	2.4	0.3	6.53	8.22	13.9	233.2	0.28	-52.1	49
14:22	2.6	0.3	6.52	8.22	14	233	0.28	-55.5	34.6
14:25	2.8	0.3	6.52	8.22	14	233	0.25	-61.4	13
14:28	3	0.3	6.52	8.22	13.9	233.2	0.26	-62.3	13.2

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless

General Comments

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25164968		
Sample Date	4/14/2025	Sample Time	14:28

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
TG-12s	Monitoring	Flush-mount		2.0	76 to 86	81

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)	
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*	
04/14/2025	15:47	86		5.12		80.88	13.18	

0.75" = 0.023 gal/ft
1" = 0.041 gal/ft
1.5" = 0.092 gal/ft
2" = 0.163 gal/ft
3" = 0.367 gal/ft
4" = 0.653 gal/ft
6" = 1.469 gal/ft
8" = 2.611 gal/ft

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	15:55	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
16:10	2	0.45	5.12	6.98	15	350.6	0.23	-117.2	1.19
16:13	2.25	0.45	5.12	6.98	15	350.4	0.17	-119.7	0.93
16:16	2.5	0.45	5.12	6.98	15	350.4	0.17	-120.5	0.72

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25164969		
Sample Date	4/14/2025	Sample Time	16:16

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

General Comments

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
TG-12i	Monitoring	Flush-mount		2.0	142 to 152	147

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)	
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*	
04/14/2025	15:50	152		5.67		146.33	23.85	

0.75" = 0.023 gal/ft
1" = 0.041 gal/ft
1.5" = 0.092 gal/ft
2" = 0.163 gal/ft
3" = 0.367 gal/ft
4" = 0.653 gal/ft
6" = 1.469 gal/ft
8" = 2.611 gal/ft

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	16:20	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
16:35	1	0.3	6.13	7.57	15.7	278.8	0.2	-80.2	11.7
16:38	1.2	0.3	6.14	7.58	15.7	277.9	0.18	-80.7	15.8
16:41	1.35	0.3	6.12	7.58	15.6	279	0.18	-81	12.9
16:44	1.5	0.3	6.12	7.59	15.6	279.1	0.18	-82.6	15
16:47	1.6	0.3	6.12	7.59	15.6	279.1	0.18	-82.8	12.6
16:50	1.75	0.3	6.12	7.59	115.5	279	0.16	-83.2	8.84

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless

General Comments

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25164970		
Sample Date	4/14/2025	Sample Time	16:50

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
TG-12d	Monitoring	Flush-mount		2.0	95 to 205	150

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*
04/14/2025	16:58	207		5.56		201.44	32.83

0.75" = 0.023 gal/ft
1" = 0.041 gal/ft
1.5" = 0.092 gal/ft
2" = 0.163 gal/ft
3" = 0.367 gal/ft
4" = 0.653 gal/ft
6" = 1.469 gal/ft
8" = 2.611 gal/ft

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*							
Purge Start Time	17:00	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*	
Time	**Cumulative Purge Volume**	**Flowrate**	**Water Level**	**pH**	**Temperature**	**Conductivity**	**Dissolved Oxygen**	**ORP**	**Turbidity**
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
17:15	2	0.4	5.58	8.04	15.2	345.5	0.25	-121.2	5.21
17:18	2.2	0.4	5.58	8.06	15.1	346.6	0.25	-127.7	5.1
17:21	2.4	0.4	5.58	8.07	15.1	345.3	0.24	-131.8	5.02
17:24	2.6	0.4	5.58	8.07	15.1	345.2	0.23	-134.9	4.59

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless

General Comments

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25164971		
Sample Date	4/14/2025	Sample Time	17:24
Container Type	**Preservative**	**Filtered (Y/N)**	**No. Containers**
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
CRS-2	Monitoring	Flush-mount		2.0	230 to 250	240

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)	
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*	*0.75" = 0.023 gal/ft* *1" = 0.041 gal/ft* *1.5" = 0.092 gal/ft* *2" = 0.163 gal/ft* *3" = 0.367 gal/ft* *4" = 0.653 gal/ft* *6" = 1.469 gal/ft* *8" = 2.611 gal/ft*
04/15/2025	9:00	275		7.34		267.66	43.63	

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	9:05	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
9:20	1.2	0.4	7.44	7.59	13.3	321	1.65	-90.2	134.0
9:23	1.4	0.4	7.45	7.59	13.3	321	1.60	-90.2	51.8
9:26	1.6	0.4	7.44	7.60	13.3	320	0.98	-92.2	110.0
9:29	1.8	0.4	7.44	7.61	13.3	320	0.62	-98.5	32.0
9:32	2.0	0.4	7.44	7.62	13.3	321	0.40	-109.9	13.9
9:35	2.2	0.4	7.44	7.63	13.3	321	0.39	-111.4	12.0

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear , colorless.

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25164972		
Sample Date	04/15/2025	Sample Time	9:35

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

General Comments

Black particulates on first flush. Collected Duplicate sample (25164973).

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
CRS-1d	Monitoring	Flush-mount		1.5	210 to 230	220

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)	
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*	
04/15/2025	12:30	230		6.13		223.87	20.60	

0.75" = 0.023 gal/ft
1" = 0.041 gal/ft
1.5" = 0.092 gal/ft
2" = 0.163 gal/ft
3" = 0.367 gal/ft
4" = 0.653 gal/ft
6" = 1.469 gal/ft
8" = 2.611 gal/ft

Water Quality Data

Purge Method	Inertia Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	12:50	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
13:05	1.5	0.3	6.18	6.59	16	105.6	2.77	-44	91.6
13:08	1.7	0.3	6.18	6.59	15.9	106.4	2.68	-43.2	91.7
13:11	1.9	0.3	6.18	6.59	15.9	106.5	2.66	-42.2	92.6
13:14	2.1	0.3	6.18	6.6	15.9	105.2	2.67	-41.9	94.2
13:17	2.3	0.3	6.18	6.59	15.8	105.5	2.57	-41.1	94.9
13:20	2.5	0.3	6.18	6.59	15.7	105.5	2.48	-40.7	92.6

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Slightly turbid, brown.

Sample Information

Sampling Method	Inertia Pump		
Sample Name	25164974		
Sample Date	4/15/2025	Sample Time	13:20

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	4
		Total No. Containers:	7

General Comments

Sampling with Waterra. Parameters collected with YSI-in-cup method.

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
CRS-1s	Monitoring	Flush-mount		1.5	113 to 133	123

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)	
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*	*0.75" = 0.023 gal/ft* *1" = 0.041 gal/ft* *1.5" = 0.092 gal/ft* *2" = 0.163 gal/ft* *3" = 0.367 gal/ft* *4" = 0.653 gal/ft* *6" = 1.469 gal/ft* *8" = 2.611 gal/ft*
04/15/2025	12:27	133		6.15		126.85	11.67	

Water Quality Data

Purge Method	Inertia Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	13:45	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
14:00	1.8	0.4	6.33	6.98	16.4	286.9	3.23	-58.6	119
14:03	2	0.4	6.33	7.01	16.3	318.4	3.23	-60.5	89
14:06	2.2	0.4	6.33	7.06	16.4	365.4	3	-67.8	72.6
14:09	2.4	0.4	6.3	7.09	16.4	402.3	2.81	-72.4	58.8
14:12	2.6	0.4	6.33	7.12	16.3	440.3	2.71	-79.9	53.8
14:15	3	0.4	6.331	7.15	16	508.7	2.77	-96.2	50.3
14:18	3.2	0.4	6.33	7.17	16	527.7	2.74	-101.4	41.4
14:21	3.5	0.4	6.33	7.18	15.9	532.7	2.54	-105.5	32.6
14:24	3.7	0.4	6.33	7.18	15.9	531.1	2.56	-106	28.5

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*	Slightly turbid, colorless.

Sample Information

Sampling Method	Inertia Pump		
Sample Name	25164975		
Sample Date	04/15/2025	Sample Time	14:24

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	4
		Total No. Containers:	7

General Comments

Sampling with Waterra. Parameters collected with YSI-in-cup method.

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
TG-7	Monitoring	Flush-mount		2.0	155 to 165	160

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*
04/15/2025	15:25	165		11.77		153.23	24.98

0.75" = 0.023 gal/ft
1" = 0.041 gal/ft
1.5" = 0.092 gal/ft
2" = 0.163 gal/ft
3" = 0.367 gal/ft
4" = 0.653 gal/ft
6" = 1.469 gal/ft
8" = 2.611 gal/ft

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*							
Purge Start Time	15:37	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*	
Time	**Cumulative Purge Volume**	**Flowrate**	**Water Level**	**pH**	**Temperature**	**Conductivity**	**Dissolved Oxygen**	**ORP**	**Turbidity**
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
15:53	1.5	0.35	12	10.63	13.9	336.9	0.28	-78.6	4.71
15:56	1.75	0.35	12.04	9.78	13.9	295.6	0.24	-64.9	2.38
15:59	2	0.35	12.04	9.44	13.8	295.6	0.21	-59.7	2.66
16:02	2.25	0.35	12.05	9.36	13.8	295.5	0.2	-59.1	1.99

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25164976		
Sample Date	4/15/2025	Sample Time	16:02
Container Type	**Preservative**	**Filtered (Y/N)**	**No. Containers**
VOA	HCl	N	3
Amber glass			0
Poly	None	N	4
		Total No. Containers:	7

General Comments

Heavy mineralization present on dedicated pump intake.

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
WWF-2	Monitoring	Flush-mount		2.0	15 to 35	25

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)	
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*	*0.75" = 0.023 gal/ft* *1" = 0.041 gal/ft* *1.5" = 0.092 gal/ft* *2" = 0.163 gal/ft* *3" = 0.367 gal/ft* *4" = 0.653 gal/ft* *6" = 1.469 gal/ft* *8" = 2.611 gal/ft*
04/15/2025	17:40	35		7.63		27.37	4.46	

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	17:47	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*		*uS/cm*	*mg/L*	*mV*	*NTU*
18:02	1.8	0.4	7.65	6.7	13	244.5	7.93	9.4	1.19
18:05	2	0.4	7.68	6.69	13	244.6	7.85	12.1	1.71
18:08	2.2	0.4	7.66	6.67	13	244.1	7.75	14	1.79

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless

General Comments

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25164977		
Sample Date	4/15/2025	Sample Time	18:08

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
SG-1	Monitoring	Flush-mount		2.0	411 to 421	416

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*
04/16/2025	9:10	421		9.78		411.22	67.03

0.75" = 0.023 gal/ft
1" = 0.041 gal/ft
1.5" = 0.092 gal/ft
2" = 0.163 gal/ft
3" = 0.367 gal/ft
4" = 0.653 gal/ft
6" = 1.469 gal/ft
8" = 2.611 gal/ft

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*							
Purge Start Time	9:40	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*	
Time	**Cumulative Purge Volume**	**Flowrate**	**Water Level**	**pH**	**Temperature**	**Conductivity**	**Dissolved Oxygen**	**ORP**	**Turbidity**
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
9:55	1.5	0.3	10.56	8.18	12.4	252.4	0.71	-30.8	2.84
9:58	1.7	0.3	10.6	8.2	12.3	251.8	0.59	-39.4	2.18
10:01	1.9	0.3	10.64	8.24	12.4	251.8	0.54	-42.4	1.62
10:04	2.1	0.3	10.66	8.24	12.4	251.7	0.53	-44.8	2.24

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless.

General Comments

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25164979		
Sample Date	4/16/2025	Sample Time	10:04
Container Type	**Preservative**	**Filtered (Y/N)**	**No. Containers**
VOA	HCl	N	3
Amber glass			0
Poly	None	N	4
		Total No. Containers:	7

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
TG-18s	Monitoring	Flush-mount		2.0	45 to 55	50

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)	
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*	
04/16/2025	11:29	55		5.95		49.05	8.00	

0.75" = 0.023 gal/ft
1" = 0.041 gal/ft
1.5" = 0.092 gal/ft
2" = 0.163 gal/ft
3" = 0.367 gal/ft
4" = 0.653 gal/ft
6" = 1.469 gal/ft
8" = 2.611 gal/ft

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	12:05	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
12:23	1.75	0.25	6.02	6.55	13.9	195.2	6.7	34.1	3.42
12:26	2	0.25	6.02	6.53	13.8	195.4	6.43	35.8	1.62
12:29	2.25	0.25	6.02	6.53	13.9	195.2	6.51	36.5	1.54

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless

General Comments

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25164981		
Sample Date	4/16/2025	Sample Time	12:29

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	2
		Total No. Containers:	5

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
TG-18d	Monitoring	Flush-mount		2.0	100 to 110	105

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)	
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*	
04/16/2025	11:25	112		6.09		105.91	17.26	

0.75" = 0.023 gal/ft
1" = 0.041 gal/ft
1.5" = 0.092 gal/ft
2" = 0.163 gal/ft
3" = 0.367 gal/ft
4" = 0.653 gal/ft
6" = 1.469 gal/ft
8" = 2.611 gal/ft

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	12:38	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
12:53	2	0.3	6.39	7.36	13.7	279.4	0.4	19.5	0.45
12:56	2.2	0.3	6.39	7.37	13.7	279.4	0.38	16.2	0.42
12:59	2.4	0.3	6.39	7.37	13.7	279.3	0.38	12.8	0.3

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless

General Comments

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25164982		
Sample Date	4/16/2025	Sample Time	12:59

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	4
		Total No. Containers:	7

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
PWB-1-LTS	Monitoring	Flush-mount		2.0	110 to 132	121

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)	
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*	
04/16/2025	14:16	133		4.00		129.00	21.03	

0.75" = 0.023 gal/ft
1" = 0.041 gal/ft
1.5" = 0.092 gal/ft
2" = 0.163 gal/ft
3" = 0.367 gal/ft
4" = 0.653 gal/ft
6" = 1.469 gal/ft
8" = 2.611 gal/ft

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	14:16	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
14:31	1.4	0.35	4.15	8.74	14.5	290.4	0.28	-24.4	8.56
14:34	1.7	0.35	4.15	8.73	14.5	290.3	0.26	-30.4	8.64
14:37	1.9	0.35	4.18	8.72	14.5	290.6	0.25	-32.4	8.41

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless

General Comments

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25164983		
Sample Date	4/16/2025	Sample Time	14:37

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	4
		Total No. Containers:	7

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)
SFP-215A	DEQ-PWB	Columbia South Shore	April 2025	Y. Perez/C. Anderson

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)
PWB-1-UTS	Monitoring	Flush-mount		2.0	63 to 86	74.5

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)	
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*	*0.75" = 0.023 gal/ft* *1" = 0.041 gal/ft* *1.5" = 0.092 gal/ft* *2" = 0.163 gal/ft* *3" = 0.367 gal/ft* *4" = 0.653 gal/ft* *6" = 1.469 gal/ft* *8" = 2.611 gal/ft*
04/16/2025	14:50	86		4.05		81.95	13.36	

Water Quality Data

Purge Method	Bladder Pump	*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time	14:51	*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*
15:06	2.4	0.45	—	9.21	14.8	279.6	1.71	-69.5	3.33
15:09	2.6	0.45	—	9.18	14.9	277.7	1.25	-83.9	1.62
15:12	2.8	0.45	—	9.11	14.9	278.4	1.28	-88	1.67
15:15	4	0.45	—	9.1	14.8	278.5	1.29	-90	1.86

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*: Clear, colorless

General Comments

No water levels during sampling due to wasps.

Sample Information

Sampling Method	Bladder Pump		
Sample Name	25164984		
Sample Date	4/16/2025	Sample Time	15:15

Container Type	Preservative	Filtered (Y/N)	No. Containers
VOA	HCl	N	3
Amber glass			0
Poly	None	N	4
		Total No. Containers:	7