PORTLAND BUREAU OF TRANSPORTATION

DESIGN EXCEPTION

DESIGN EXCEPTION NUMBER

PROJECT (PERMIT) NAME	PROJECT (PERMIT) NO.
E11640 SW 61st Culvert Replacement	UP-2026-000368
REQUESTED BY (NAME AND TITLE):	**REQUEST DATE**
Chris Lastomirsky, Project Manager	2/26/26

Design Exceptions

- ☐ Design Speed
- ☐ Lane Width
- ☐ Shoulder Width/Shy Distance
- ☐ Bridge Width
- ☐ Bridge Rail
- ☐ Vertical Clearance
- ☐ Structural Capacity
- ☐ Grade
- ☐ Horizontal Alignment
- ☐ Vertical Alignment
- ☐ Stopping Sight Distance
- ☐ Clear Zone
- ☐ Pavement Cross Slope
- ☐ Pavement Design Width
- ☐ Bike Lane Width
- ☐ Bike/Multi-Use Path
- ☐ Width ADA Standards
- ☐ Marked Crosswalk
- ☐ Detectable Tactile Color
- ☐ Sidewalk Width
- ☐ Parking Width
- ☐ Diagonal Parking
- ☐ Street Lighting
- ☐ Traffic Signal
- ☐ Warrant Utility
- ■ (Other)

DESIGN EXCEPTION DESCRIPTION (CITE THE **STANDARD, GUIDELINE, OR POLICY** THAT WILL NOT BE MET):

Pedestrian Fencing (ODOT Std. Dwg. BR246) installed on reinforced concrete headwalls do not meet clear zone guidance published in the AASHTO Roadside Design Guide.

PROJECT DESCRIPTION:

This project will replace an undersized culvert as part of the Urgent Capacity Shell. Due to the deep channel and downstream erosion, a headwall is required to protect the asset. The headwalls will have Pedestrian Fencing BR246 attached to protect the public from falls.

LOCATION OF DESIGN FEATURE (STREET,CROSS STREET, STATIONING AND OFFSET):

SW 61st adjacent to 11008 SW 61st Ave.

REASON(S) FOR DESIGN EXCEPTION:

Pedestrian Fencing (ODOT Std. Dwg. BR246) is required by PBOT Bridges & Structures to mitigate the fall hazard created by the proposed culvert headwall. Existing conditions warrant pedestrian fencing, but it has not been installed previously. The headwall and fencing cannot be located outside the clear zone due to stability impacts on existing private structures and private sewers. Per PBOT traffic engineering, PBOT typically relies upon the clear zone guidance published in the Roadside Design Guide to help inform design decisions when installing fixed objects along a roadside. The recommended clear zone is determined using the design speed and design volume of the roadway. The subject segment of SW 61st Ave has a posted speed limit of 25 mph (reduced from 30 mph in 2025) and an average daily traffic volume of approximately 2,200 vehicles per available traffic data collected in 2025. Therefore, the recommended clear zone in this area is between 12 and 16 feet per the AASHTO Roadside Design Guide. The proposed pedestrian fencing falls within this range.

MITIGATION OPTIONS AND ASSOCIATED COSTS:

Breakaway rail posts were considered, but could not be sourced for this application (do not exist).

COMPATIBILITY WITH ADJACENT STREET SECTIONS:

The proposed design is compatible with adjacent street sections which include the following existing obstructions within the same clear zone envelope: mailboxes, trees, utility poles, shrubs, concrete block planters, drainage ditches, regulatory sign posts, etc.

PROBABLE TIME BEFORE RECONSTRUCTION OF STREET (IF NOT CONSTRUCTED AS PART OF THESE IMPROVEMENTS):

Unknown

RECOMMENDATION:

Approve the installation of the pedestrian fencing within the clear zone, with added delineation. Delineate the upstream ends of the pedestrian fencing using Type 3 object markers (MUTCD sign code: OM-3R, PBOT sign code: W2360).

Please include supporting documentation (plan sections, cross sections, alignment sheets & details)

PREPARED BY (Check all boxes that apply)

EOR PE Stamp & Seal

☒ PROJECT MANAGER Chris Lastomirsky	ADDRESS 1120 SW 5th, Portland Oregon
☒ ENGINEER OF RECORD Cameron Glasgow	
COMPANY NAME City of Portland	EMAIL ADDRESS Cameron.Glasgow@portlandoregon.gov

DO NOT WRITE BELOW THIS LINE - PBOT USE ONLY

CONCURRENCE:

☒ Subject Matter Expert support memo (email) attached, if not provide explanation:

SECTION MANAGER, DATE

DIVISION MANAGER, DATE

APPROVALS:

☐ YES ☐ NO DP&T GROUP MANAGER, DATE

☐ YES ☐ NO CITY TRAFFIC ENGINEER, DATE

☒ YES ☐ NO Wendy Cawley CITY ENGINEER, Wendy Cawley 3/23/2026 DATE

REASON FOR NOT APPROVING

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APPENDIX

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Geotechnical Report

CITY OF PORTLAND
ENVIRONMENTAL SERVICES

Materials Testing Laboratory ▪ 1405 N River Street, Bldg 117, Portland, Oregon 97227 ▪ Dawn Uchiyama, Director

March 14, 2024

Chris Lastomirsky
City of Portland
Bureau of Environmental Services
1120 SW Fifth Avenue
Portland, OR 97204-1792

Geotechnical Report
SW 61st Culvert Replacement
Portland, Oregon
BES Project E11640

INTRODUCTION

This report presents the results of the geotechnical investigation completed by the Materials Testing Laboratory (MTL) for the SW 61st Culvert Replacement Project. The existing culvert, a 24-inch diameter corrugated metal pipe (CMP) is hydraulically undersized, leading to flooding of adjacent properties. The project includes: (i) installation of a new 30-inch diameter reinforced concrete pipe (RCP) to increase capacity, (ii) protection of existing retaining wall, and (iii) installation of new inlet and outfall structures. The project area is shown on the site plan, Figure 1.

The purpose of this geotechnical study is to explore subsurface conditions along the proposed culvert replacement and provide recommendations for use in the design and construction of the new pipe. Our scope of work includes a review of pertinent historical records (reports, and geologic and groundwater maps), site reconnaissance, subsurface explorations, laboratory testing, and engineering assessment.

GEOLOGICAL SETTING

According to a geologic map (O-12-02) published by the Oregon Department of Geology and Mineral Industries (DOGAMI) (Ma et al., 2012), the surficial geologic unit in the project area is mapped as basalt of Mount Sylvania, Qbsy (Ma et al., 2012), a member of the Boring Volcanic Field. The Boring Volcanic Field is the name given to numerous small volcanic eruptions and associated basalt flows in the Portland area between 120 thousand to 2.4 million years ago (Ma et al., 2012). The composition of these deposits varies considerably across the Portland Area, depending on elevation and the distance to major drainage channels.

The geologic unit is described by Ma et al., 2012, as follows:

> **Qbsy-I,** *basalt of Mount Sylvania and loess (Pleistocene)* — Basalt or basaltic andesite tephra and lava flows making up the roughly conical Mount Sylvania.

Based on our exploration, the near surface basalt in the project site appears to have decomposed to a clayey soil.

The U.S. Geological Survey (USGS) has mapped the depth to groundwater within the proposed project site at a depth of greater than 60 below ground surface (bgs) (Snyder, 2008).

FIELD EXPLORATIONS AND TESTING

Our field explorations were performed cooperatively with the Coordinated Site Analysis (CSA) group, who will provide the environmental-related findings in a separate report. The field exploration consisted of one soil boring, Boring B-1, drilled near the proposed culvert replacement alignment. The boring was drilled on January 31, 2025, to a depth of 36.5 feet below ground surface. The approximate location of the boring is shown on Figure 1.

A description of drilling methods and copy of the boring log are provided in Appendix A. Laboratory tests were performed on selected soil samples and the test results are included in Appendix B and shown on the boring log.

SITE CONDITIONS

Surface Conditions

The project site is located in a residential neighborhood of SW Portland along the 1100 block of SW 61st Avenue. SW 61st Avenue is a paved two-lane local roadway, with no curbs, paved shoulders, or sidewalks. Shallow ditches line both sides of the roadway with small diameter pipes conveying stormwater from the ditches to the main drainage channel where the existing culvert runs beneath the roadway.

The existing culvert is a 47-foot-long concrete sewer pipe (CSP) that crosses SW 61st Ave from east to west at a slight diagonal angle to the roadway. The pipe invert elevation drops about 3.5 feet from inlet to outlet with at an approximate pipe depth of 9 to 10 feet bgs. The culvert transports stormwater along an existing drainage channel that flows along private property from 11008 SW 61st Ave to the east to 10945 and 11009 SW 61st Ave to the west. The drainage channel along the private properties is conveyed through pipes that are privately maintained. Between the private conveyance pipes and the culvert are short, 5 to 10 feet long, stretches of open ditches. These channel ditches are approximately 5 to 6 feet deep and are sloped at an approximate 1H:1V angle from the ground surface except on the southern side of the downstream channel where an existing

cement block and railroad tie retaining wall supports a near vertical face. This existing retaining wall extends along the public-right-of-way onto the private property at 11009 SW 61st Ave.

Subsurface Conditions
The soil conditions encountered in the project consist of the following units:

- **Pavement:** Boring B-1 encountered about 8 inches of asphalt cement over about 4 inches of aggregate base rock.

- **Residual Soil**
  A lean clay residual soil was encountered below the road pavement extending down to a depth of 26 feet bgs. The soils classified as a Lean Clay (CL) with trace amounts of fine sand from 10 to 20 feet bgs. From 20 to 26 feet bgs, the coarse-grained soil content increased, and the soil classified as a Sandy Lean Clay with Gravel (CL). The lean clay soils were medium to highly plastic with a medium stiff to stiff consistency. Moisture contents ranged from 20.1 to 30.8 percent, liquid limits ranged from 37 to 48, and plasticity limits ranged from 21 to 24.

- **Decomposed Basalt**
  A sandy elastic silt soil was encountered below the lean clay soils at a depth of 26 feet bgs extending to the termination depth of the boring at 36.5 feet bgs. These soils showed a high degree of iron staining and mottling indicative of a basalt that had decomposed through chemical altering to a soil. The soils were a soft in consistency and saturated with a moisture content of 70.9 percent suggesting a perched water table may have formed in the layer due to deeper, more competent basalt preventing water flow. A liquid limit of 65 and a plastic limit of 40 was measured for the soil.

The proposed pipe will likely be founded within the Residual Soil deposits.

Groundwater
Groundwater was encountered at a depth of 29 feet bgs. The groundwater is mostly likely a perched condition associated with deeper, more competent basalt limiting the infiltration of groundwater. Groundwater levels at the site are anticipated to fluctuate throughout the year, rising during extended periods of wet weather.

CONCLUSIONS AND RECOMMENDATIONS

Based on our geotechnical investigation, the following subsurface conditions could impact construction:

- Adjacent nearby utilities, property lines, or existing retaining walls within the influence zone of the proposed excavations may limit a contractor's means or methods.

- An existing cement block and railroad tie retaining wall at the culvert outlet will need to be supported or removed during construction.

- Soft or wet fine-grained soils may be encountered during excavation, requiring stabilization of the subgrade below the culvert or retaining walls.

Shoring and Excavation

Construction site safety is the responsibility of the Contractor, who is solely responsible for the means, methods, and sequencing of construction operations. Project plans indicate that the project excavations could range from about 6 to 7 feet in depth for installation of the culvert and 9 to 10 feet in depth for installation of the inlet and outlet structures. As indicated above, the cement block and railroad tie retaining wall in the downstream channel will need to be supported or removed during construction.

The design of temporary shoring systems is the responsibility of the Contractor, subject to review and approval by the City of Portland. At a minimum, all excavations must comply with current OR-OSHA excavation standards. For the preliminary design of shoring systems and excavation methods we have classified the soil types we expect to encounter according to OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, and recommend the following soil parameters for the selection and design of shoring:

Soil Parameters for Shoring

Soil	Soil Type	Phi Angle (deg.) Max/Min	Unit Weight (pcf) Max/Min
Fine-grained soils (Clay and Silt)	Type C	30/28	110/105

Most excavations in the project area will encounter Type C soils. Shoring for excavations in Type C soils should be selected and installed using methods to prevent running soils or sloughing.

The soils within the proposed excavation zones may vary significantly across the project area. Our preliminary soil classification is based on the materials encountered in a borehole that was located outside of the proposed trench line. The Contractor should employ a competent person to evaluate subsurface conditions and apply the appropriate shoring system for the conditions encountered.

During open-cut trench excavation, trench widening could occur. Trench geometry and width affect the loading on the newly installed pipe. If trench widths exceed the design trench width for a given pipe diameter (i.e. neat line pay width), the Contractor should consult the pipe manufacturer to confirm that the design Factor of Safety can still be achieved. If the safe trench width is exceeded, the Contractor should provide a construction method that will achieve the design Factor of Safety.

Subsurface utilities within the zone of influence of the proposed trench excavation and soils supporting adjacent utilities within the zone of influence should be braced to prevent lateral movement or utility damage. The zone of influence is defined as a soil wedge extending upward from the bottom corner of the excavation at a gradient of 1.5H:1V. Trench sidewall support may require slide-rail shoring, hydraulic shoring, or backfilling of trench shields. Contractors should follow the most recent version of the City of Portland Standard Construction Specifications (SCS).

Finish slopes should have final grades of 2H:1V or flatter.

Dewatering

Groundwater was encountered in the project borings at a depth of 29 ft bgs. Project excavations are not anticipated to extend to this depth; however, perched groundwater or groundwater seepage may be encountered at shallower depths during excavations. The design of the dewatering system is the responsibility of the Contractor, subject to the approval of the City of Portland. We anticipate that the seepage amounts will be small and can be controlled with pumping from strategically located sumps during excavation.

Culvert Recommendations

We understand that the replacement culvert will likely consist of a 30-inch diameter RCP at a similar depth and alignment to the existing culvert but with a slightly shallower slope. The invert elevation of the culvert is anticipated at an elevation between 372.5 and 374.5 feet (City of Portland datum), approximately 5 to 7 feet below existing ground surface, and will likely encounter medium stiff clays. If unsuitable soils are encountered, such as wet or soft soils, the culvert should be stabilized as recommended by the geotechnical engineer with a method such as over-excavation and replacement with stabilization rock fill.

The culvert and pipe bedding materials and backfill around the culvert should consist of compacted base aggregate that meets the requirements of the City of Portland SCS. The backfill should be compacted in maximum 12-inch-thick lifts to 95% of maximum density as determined by standard proctor (ASTM D 698). Only hand operated compaction equipment should be used within 4 feet of the culvert. If the culvert manufacture provides more stringent culvert backfill material and compaction requirements, the manufacturer's installation requirements should be followed.

Retaining Wall Recommendations

We understand that a cast-in-place cantilevered retaining walls are proposed to support grade near the outlet of the proposed culvert. For unrestrained site retaining walls, we recommend using an active pressure of 34 pounds per cubic foot (pcf) equivalent fluid pressure for design. The seismic lateral force on yielding walls subject to active pressures can be calculated based on a dynamic force of $12H^2$ pounds per lineal foot of wall, as calculated using the Mononobe-Okabe method, where H is the height of the wall measured from the base in feet. The dynamic force should be applied as a distributed load with the centroid located at 0.5H from the base of the wall.

The required minimum excavation depth to subgrade for the base of the wall is 12 inches below final grade at the front toe of the wall allow room for wall embedment and the underlying levelling pad. The base of the wall should be underlain by a minimum 6-inch-thick levelling pad composed of crushed rock granular fill, and the bottom gravity block should be embedded at least 12 inches below the adjacent finished grade. As indicated previously, after excavation to the required elevations and prior to placing the levelling pad, the exposed wall subgrade should be inspected by a geotechnical engineer for suitability.

We recommend the soil parameters presented in Table 1 for retaining wall analysis.

Table 1. Recommended Soil Parameters for Retaining Wall Design

Soil Type	Unit Weight (pcf)[1]	Cohesion (psf)[2]	Friction Angle (degrees)
Retained Material– Native Soils	105	0	28
Foundation soil –Granular Fill	130	0	35

1. Pounds per cubic foot
2. Pounds per square foot

The recommended allowable bearing capacity of the soils is 2,000 psf with the understanding that it is supported on a 6-inch-thick layer of compacted granular fill. The friction coefficient for wall base resting on granular fill is 0.40.

A shear key may be used to provide additional sliding resistance to the retaining wall. We recommend using a passive pressure of 300 pcf equivalent fluid pressure for the key design. The base of the retaining wall should not be included in the passive resistance unless a permanent pavement is installed in front of the wall to prevent scour of the toe soils.

Surcharges behind the walls within a horizontal distance from the back of the wall equal to twice the height of the wall, such as retained slopes, or roadway should be accounted for in the wall design. We can provide additional information for appropriate wall surcharges if necessary.

A drainage system should be installed behind the walls to prevent buildup of hydrostatic pressures. The drainage system should consist of a minimum 2-foot-thick section of free-draining granular fill behind the entire height of the wall. A minimum 4-inch diameter perforated drainpipe should be placed behind the wall. The pipe should be wrapped in a geotextile fabric. The drainage pipe should be routed with adequate slope to an appropriate location away from the base of the wall and should not be tied directly into the stormwater drain system.

Walls typically experience movement up to 1 percent of the wall height immediately after installation, as the wall rotates and develops lateral earth pressures. We recommend

postponing construction of flatwork located adjacent to the retaining wall, at least four weeks after backfilling the wall.

Permanent Slopes
For re-grading of channel slopes, final slopes composed of compacted granular fill should be no steeper than 2H:1V (horizontal:vertical). If steeper permanent slopes are required, we recommend a further evaluation of the geometry and soil conditions to determine whether a reinforced slope (such as geotextile wrapped wall) a buttress (with large angular rock), or a retaining wall can be used to increase stability of the slopes.

Subgrade Evaluation
After site preparation and excavation for the proposed structures, the exposed subgrade should be evaluated by the project geotechnical engineer. Areas that are deemed unsuitable for subgrade such as soft soils should be removed and replaced with compacted structural fill under the direction of the geotechnical engineer. Subgrade should consist of firm native soils or compacted structural fill as approved by the project geotechnical engineer during construction.

STRUCTURAL FILL

General
Structural fill areas include fill placed beneath culverts, inlet/outlet inserts, and retaining walls. Materials used for structural fill, and placement and compaction of fill, should meet the appropriate specifications provided in the latest edition of the City of Portland SCS.

On-site soils (for fill)
Based on our explorations, excavated soils will consist primarily of variable materials including silt and clays. The moisture content of the fine-grained soils will likely be wet of optimum. Generally, under these conditions, soils will be difficult to adequately compact on-site and place as structural fill. If the soils cannot be properly moisture conditioned (dried), we recommend using imported structural fill. Organic soils should not be re-used as structural fill. Furthermore, construction debris, and other deleterious materials should be removed prior to re-using on-site soils for backfills.

Imported Granular Material
Imported granular material used as structural fill should meet the specifications provided in SCS Section 00330.14 (Selected Granular Backfill) or 00330.15 (Selected Stone Backfill), with the exception that the material should have less than 7 percent by dry weight passing a U.S. Standard No 200 Sieve and have at least two mechanically fractured faces. Imported granular material should be placed in lifts no greater than 12 inches thick and compacted to 95 percent of the maximum dry density as determined by ASTM D 698.

Stabilization Material
Stabilization material used for stabilizing trenches should meet the specifications provided in SCS 00405.11 Trench Foundation Stabilization Material. The material should have at least two mechanically fractured faces. Stabilization material should be placed in lifts between 12 inches thick and compacted to a well-keyed, firm condition.

Drain Rock
Drain rock placed in drainage zones should consist of angular, granular material that meets the requirements of the SCS Section 00430.11 (Granular Drain Backfill Material). Drain rock should be compacted to a well-keyed condition. The drain rock should be wrapped in a Type 1 drainage geotextile that meets the specifications provided in SCS Table 02320-1 (Geotextile Property Values). The geotextile should be installed in accordance with SCS 00350 (Geosynthetic Installation).

Aggregate Base
The aggregate base beneath pavements should consist of ¾- or 1 ½ - inch minus material and meet the requirements in SCS 00641 (Aggregate Subbase, Base, and Shoulders). The aggregate should have less than 5 percent by dry weight passing the U.S. Standard No. 200 sieve. The aggregate should be compacted to 95% of the maximum dry density as determined by ASTM D698.

CONSTRUCTION MONITORING

We recommend that we be present on-site during excavation to evaluate the suitability of subgrade soils for the culvert and retaining walls. On-site observations may also aid in recognizing and reconciling other unanticipated soil or groundwater conditions and to verify that design recommendations are appropriate and properly implemented during construction.

The MTL should review the Contractor's submittals including for shoring and dewatering to confirm they are compatible with site conditions. The MTL should also test backfill compaction to determine that work is proceeding in accordance with the plans and specifications.

CLOSURE

The MTL should review the final project plans/specifications and the Contractor's proposed excavation and shoring plan to evaluate if they are compatible with site conditions. The MTL should test backfill compaction.

We appreciate the opportunity to participate in this project. Please contact us if you have questions about this report.

Respectfully,

Jed Stoken, P.E.
Geotechnical Engineer

Viola Lai, P.E., G.E.
Supervising Engineer

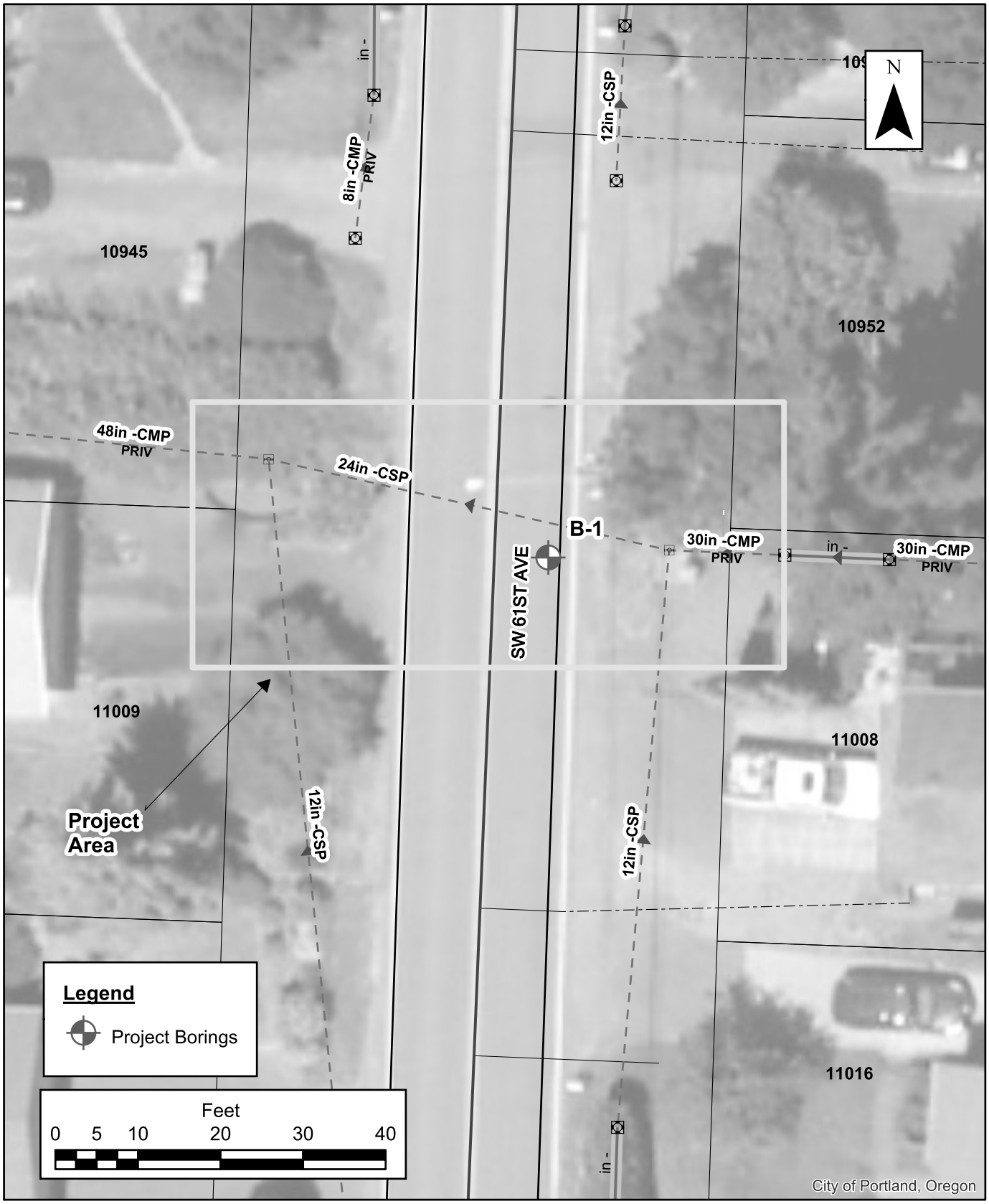
Attachments:

Figure 1	Site Plan with Project Boring
Appendix A	Field Explorations
Appendix B	Laboratory Testing

REFERENCES

Ma, L., Madin, I.P., Duplantis, S. and Williams, K, 2012, *Lidar-Based Surficial Geologic Map and Database of the Greater Portland Area, Clackamas, Columbia, Marion, Multnomah, Washington, and Yamhill Counties, Oregon, and Clark County Washington*, Oregon Department of Geology and Mineral Industries, Open-file Report 0-12-02.

Snyder, D.T, 2008, *Estimated Depth to Ground Water and Configuration of the Water Table in the Portland, Oregon Area*. U.S. Geological Survey, Scientific Investigations Report.



CITY OF PORTLAND
ENVIRONMENTAL SERVICES
MATERIALS TESTING LABORATORY

SW 61st Culvert Replacement
Portland, OR
Site Plan with Project Boring

Figure
1

JOB NUMBER
E11640

DATE
02/27/2025

APPENDIX A: FIELD EXPLORATIONS

APPENDIX A: FIELD EXPLORATIONS

The field investigation consisted of drilling one boring, Boring B-1, on January 31, 2025, to a depth of 36.5 feet bgs. The exploration log is included in this appendix. The boring location is shown in the Site Plan, Figure 1. The location of the exploration was estimated by measuring the distance from existing features and should be considered approximate.

The boring was drilled using a truck mounted CME 75 drill rig operated by Western States Soil Conservation, Inc. The drill rig used hollow stem auger techniques to drill the boring. Soil samples were collected at 2.5-foot intervals in the upper 10 feet of the boring and 5-foot intervals thereafter by the Standard Penetration Test (SPT) method in general accordance with ASTM D1586. Two sampler types were used for the SPTs, a 2-inch outside diameter, 1-3/8-inch inside diameter split spoon sampler and a 3-inch outside diameter, 2-1/2-inch inside diameter modified California sampler. Both samplers were driven 18 inches (1.5 feet) into soil with a 140-pound auto-trip hammer with a free-fall of 30 inches. The number of blows required to drive the sampler the last 12 inches (1 foot) into the soil is shown on the exploration log.

A MTL geotechnical engineer logged the boring and obtained samples for visual classification and laboratory testing. Soils encountered in the exploration were field classified in accordance with ASTM D2488*, Standard Practice for Description and Identification of Soils* (Visual-Manual Method). A log of the exploration with soil classifications and sample depths is presented on Figure A-1. Soil names, symbols and terms used to describe soil relative density and consistency used in preparing the boring log are explained on Figure A-2.

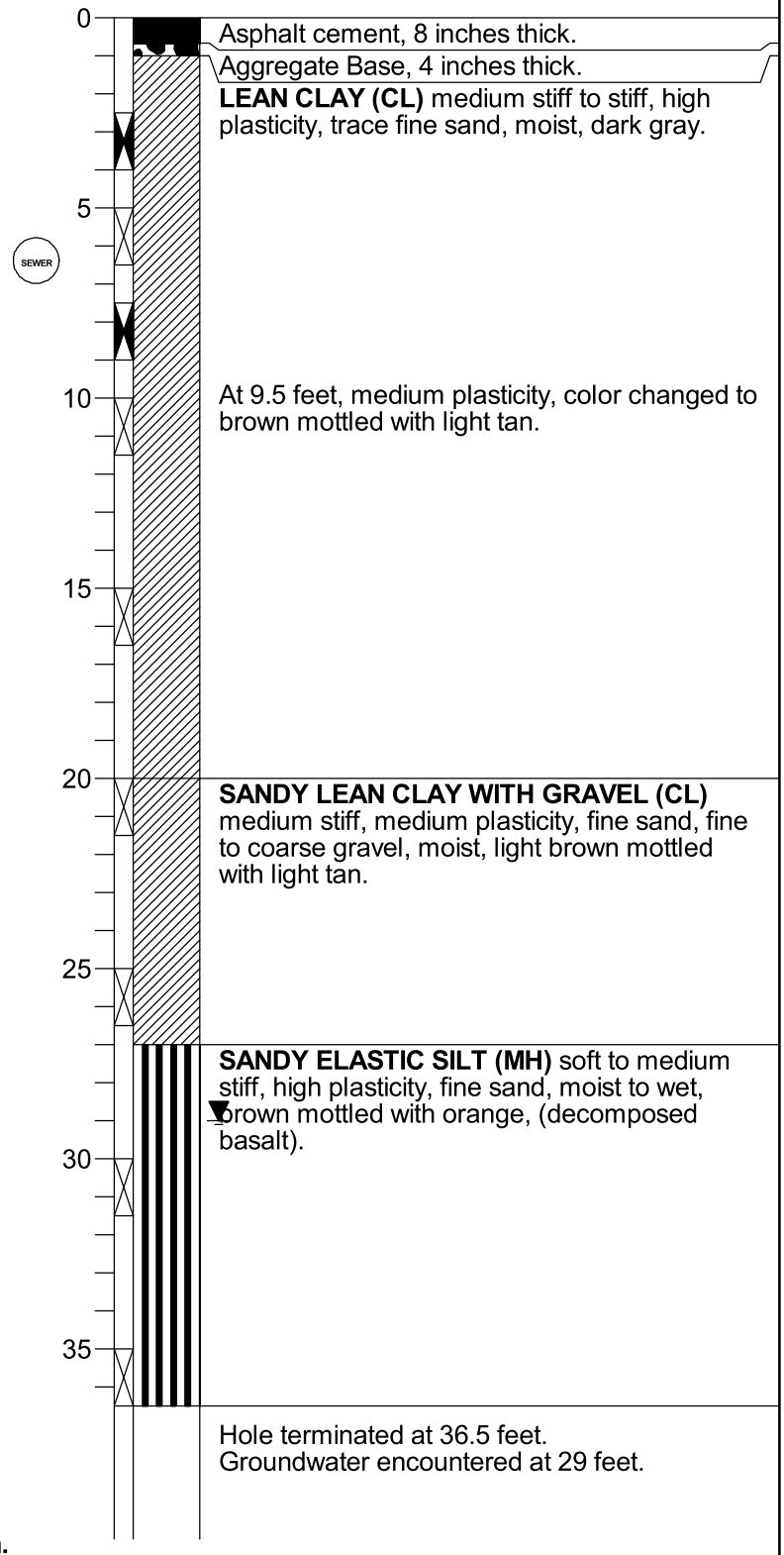
MTL Map I.D. 15809

LOG OF B-1

Equipment **CME75**

Elevation **381 Feet**** Date **1/31/25**

Laboratory Test Results or Remarks	Sample No.	Blows/6"	N Value (Uncorrected)	Content(%) Moisture
	1	2-2-3	5	
P200%= 96.0, LL= 48, PL=24	2	1-3-3	6	30.8
	3	3-5-6	11	
P200%=98.0, LL=37, PL=21	4	2-3-3	6	26.3
	5	2-4-5	9	
P200%=58.3, LL=38, PL=21	6	3-12-38	50	20.1
	7	3-3-5	8	
P200%=52.5, LL=65, PL=40	8	2-0-2	2	70.9
	9	0-2-4	6	



0 — Asphalt cement, 8 inches thick.
Aggregate Base, 4 inches thick.
LEAN CLAY (CL) medium stiff to stiff, high plasticity, trace fine sand, moist, dark gray.

At 9.5 feet, medium plasticity, color changed to brown mottled with light tan.

20 — **SANDY LEAN CLAY WITH GRAVEL (CL)** medium stiff, medium plasticity, fine sand, fine to coarse gravel, moist, light brown mottled with light tan.

25 — **SANDY ELASTIC SILT (MH)** soft to medium stiff, high plasticity, fine sand, moist to wet, brown mottled with orange, (decomposed basalt).

30

35 — Hole terminated at 36.5 feet.
Groundwater encountered at 29 feet.

**Elevation based on project survey. COP Datum.

2016 LOG WITH BLOW CTS & SEWER BES E11640 SW 61ST CULVERT REPLACEMENT.GPJ 3/14/25

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ENVIRONMENTAL SERVICES
MATERIALS TESTING LABORATORY

SW 61st Culvert Replacement
Portland, OR
Eastbound lane of SW 61st Avenue

FIGURE
A-1

JOB NUMBER	LOGGED BY	REVIEWED BY	DATE PRINTED
E11640	**J. Stoken**	**V. Lai**	**3/11/2025**

SOIL CLASSIFICATION CHART

based on ASTM D2487 and D2488

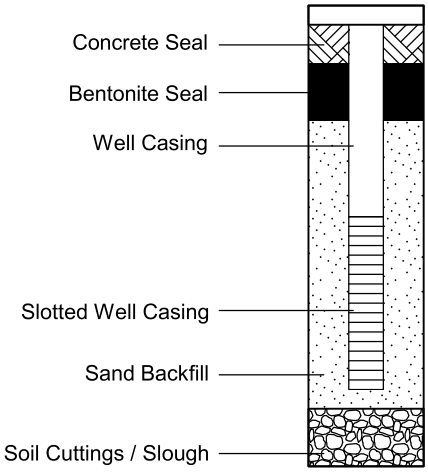
MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVEL
				GP	POORLY-GRADED GRAVEL
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVEL
				GC	CLAYEY GRAVEL
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SAND
				SP	POORLY-GRADED SAND
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SAND
				SC	CLAYEY SANDS
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILT
				CL	LEAN CLAY
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	ELASTIC SILT
				CH	FAT CLAY
				OH	ORGANIC SILT OR CLAY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOIL

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

SAMPLER TYPE LEGEND

- 2" O.D. Split Spoon Sampler
- 3" O.D. Modified California Sampler
- GeoProbe Push
- Grab Sample
- Shelby Tube
- Approximate Sewer Pipe Invert Depth
- Groundwater Level (ATD = At Time of Drilling)
- Groundwater Level and Date

WELL INSTALLATION DETAILS



APPARENT/RELATIVE DENSITY OR CONSISTENCY VERSUS SPT BLOW COUNTS

COHESIONLESS SOILS		COHESIVE SOILS	
APPARENT DENSITY	SPT N-VALUE (# BLOWS/FT)	CONSISTENCY	SPT N-VALUE (# BLOWS/FT)
VERY LOOSE	< 4	VERY SOFT	< 2
LOOSE	4 - 10	SOFT	2 - 4
MEDIUM DENSE	10 - 30	MEDIUM STIFF	4 - 8
DENSE	30 - 50	STIFF	8 - 15
VERY DENSE	> 50	VERY STIFF	15 - 30
		HARD	> 30

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SW 61st Culvert Replacement
Portland, OR
Terms & Symbols Used on Boring Logs

FIGURE
A-2

JOB NUMBER
E11640

DATE
3/11/2025

APPENDIX B: LABORATORY TESTING

APPENDIX B: LABORATORY TESTING

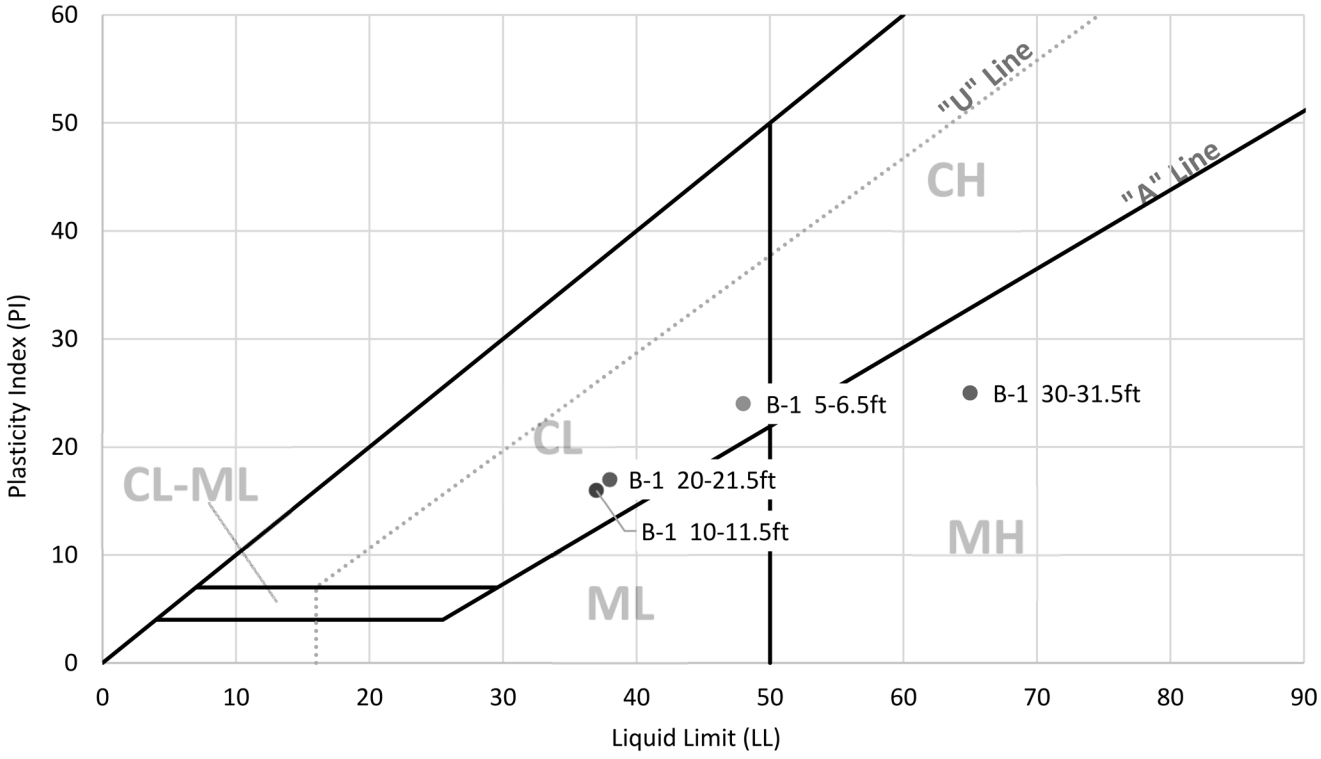
Samples were reexamined in the laboratory to confirm field classifications and to select representative samples for testing. Laboratory tests were conducted on selected soil samples collected from the soil borings to assist in the characterization of certain physical properties of the on-site soils. The laboratory tests included moisture content, grain size analysis, and Atterberg limits. Samples tested are noted on the boring log in Appendix A. Tabulated testing summaries and copies of the testing reports for the grain size analysis are included in this Appendix.

Summary of Laboratory Data

3/10/2025

E11640 SW 61st Culvert Replacement

Sample Location		Moisture Content (%)	Dry Density (PCF)	Sieve			Atterberg Limits		
Boring	Depth (ft)			Gravel (%)	Sand (%)	P200 (%)	Liquid Limit	Plastic Limit	Plasticity Index
B-1	5-6.5	30.8				96.0	48	24	24
B-1	10-11.5	26.3				95.0	37	21	16
B-1	20-21.5	20.1				58.3	38	21	17
B-1	30-31.5	70.9				52.5	65	40	25



Passing No 200 in Soils

ASTM D1140

Report #: MF0042-000001-00

City of Portland Materials Testing Lab
1405 N River St
Portland, OR 97227
Phone: 503-823-2340

Client:

Bureau of Environmental Services
1120 SW 5TH AVE. RM. 1000
PORTLAND, OR 97204

Project:

E11640 (E11640.W40)
SW 61st Culvert Replacement
1108 SW 61st Ave
Portland, OR

General Information

Sample Number:	781	**Sample Date:**	02/04/2025
Sample From:	Boring	**Sampling Method:**	Auger Boring ASTM D1452
Boring Number:	B-1	**Depth (ft):**	5-6.5
Technician:	Zoie Yetley		

Test Results

Mass of Test Sample Meet Minimum Requirement:	Yes
Test Specimen Contain More Than One Sample Type (layered):	No
Percent of Water Content (Method B):	30.8
Preparation Method:	Method A - Non-Cohesive Soils
Length of Time Sample Soaked (minutes):	1435 (23.92 hours)
Total Dry Sample Mass (grams):	204.6
Material Finer Than 75 µm (No. 200) Sieve (%):	96.0

Test Completed Date:	02/10/2025	**Test Completed By:**	Sheri Dauphinais

Reviewed By: Andrew Weiher
Date: 02/10/2025

Passing No 200 in Soils

ASTM D1140

Report #: MF0042-000002-00

City of Portland Materials Testing Lab
1405 N River St
Portland, OR 97227
Phone: 503-823-2340

Client:

Bureau of Environmental Services
1120 SW 5TH AVE. RM. 1000
PORTLAND, OR 97204

Project:

E11640 (E11640.W40)
SW 61st Culvert Replacement
1108 SW 61st Ave
Portland, OR

General Information

Sample Number:	782	**Sample Date:**	02/04/2025
Sample From:	Boring	**Sampling Method:**	Auger Boring ASTM D1452
Boring Number:	B-1	**Depth (ft):**	10-11.5
Technician:	Zoie Yetley		

Test Results

Mass of Test Sample Meet Minimum Requirement:	Yes
Test Specimen Contain More Than One Sample Type (layered):	No
Percent of Water Content (Method B):	26.3
Preparation Method:	Method B - Cohesive Soils
Length of Time Sample Soaked (minutes):	1427 (23.78 hours)
Total Dry Sample Mass (grams):	209.4
Material Finer Than 75 µm (No. 200) Sieve (%):	95.0

Test Completed Date:	02/10/2025	**Test Completed By:**	Sheri Dauphinais

Reviewed By: Andrew Weiher
Date: 02/10/2025

Passing No 200 in Soils

ASTM D1140

Report #: MF0042-000003-00

City of Portland Materials Testing Lab
1405 N River St
Portland, OR 97227
Phone: 503-823-2340

Client:

Bureau of Environmental Services
1120 SW 5TH AVE. RM. 1000
PORTLAND, OR 97204

Project:

E11640 (E11640.W40)
SW 61st Culvert Replacement
1108 SW 61st Ave
Portland, OR

General Information

Sample Number:	784	**Sample Date:**	02/04/2025
Sample From:	Boring	**Sampling Method:**	Auger Boring ASTM D1452
Boring Number:	B-1	**Depth (ft):**	20-21.5
Technician:	Zoie Yetley		

Test Results

Mass of Test Sample Meet Minimum Requirement:	Yes
Test Specimen Contain More Than One Sample Type (layered):	No
Percent of Water Content (Method B):	20.1
Preparation Method:	Method A - Non-Cohesive Soils
Length of Time Sample Soaked (minutes):	1443 (24.05 hours)
Total Dry Sample Mass (grams):	254.2
Material Finer Than 75 µm (No. 200) Sieve (%):	58.3

Test Completed Date:	02/10/2025	**Test Completed By:**	Sheri Dauphinais

Reviewed By: Andrew Weiher
Date: 02/10/2025

Passing No 200 in Soils

ASTM D1140

Report #: MF0042-000004-00

City of Portland Materials Testing Lab
1405 N River St
Portland, OR 97227
Phone: 503-823-2340

Client:

Bureau of Environmental Services
1120 SW 5TH AVE. RM. 1000
PORTLAND, OR 97204

Project:

E11640 (E11640.W40)
SW 61st Culvert Replacement
1108 SW 61st Ave
Portland, OR

General Information

Sample Number:	786	**Sample Date:**	02/04/2025
Sample From:	Boring	**Sampling Method:**	Auger Boring ASTM D1452
Boring Number:	B-1	**Depth (ft):**	30-31.5
Technician:	Zoie Yetley		

Test Results

Mass of Test Sample Meet Minimum Requirement:	Yes
Test Specimen Contain More Than One Sample Type (layered):	No
Percent of Water Content (Method B):	70.9
Preparation Method:	Method B - Cohesive Soils
Length of Time Sample Soaked (minutes):	262 (4.37 hours)
Total Dry Sample Mass (grams):	179.2
Material Finer Than 75 µm (No. 200) Sieve (%):	52.5

Test Completed Date:	02/10/2025	**Test Completed By:**	Andrew Weiher

Reviewed By: Andrew Weiher
Date: 02/10/2025

Atterberg Plasticity Index of Soil

ASTM D4318

Report #: MF0046-000001-00

City of Portland Materials Testing Lab
1405 N River St
Portland, OR 97227
Phone: 503-823-2340

Client:

Bureau of Environmental Services
1120 SW 5TH AVE. RM. 1000
PORTLAND, OR 97204

Project:

E11640 (E11640.W40)
SW 61st Culvert Replacement
1108 SW 61st Ave
Portland, OR

Sample Number:	782	**Sample Date:**	02/04/2025
Sample From:	Boring	**Sampling Method:**	Auger Boring ASTM D1452
Boring Number:	B-1	**Depth (ft):**	10-11.5
Technician:	Zoie Yetley		

Max Grain Size (mm): 2.00

As-Received % Moisture: 26.0

Removed #40 Larger Particles: Combination of hand and washing.

% Retain on No. 40 Sieve: 0.8

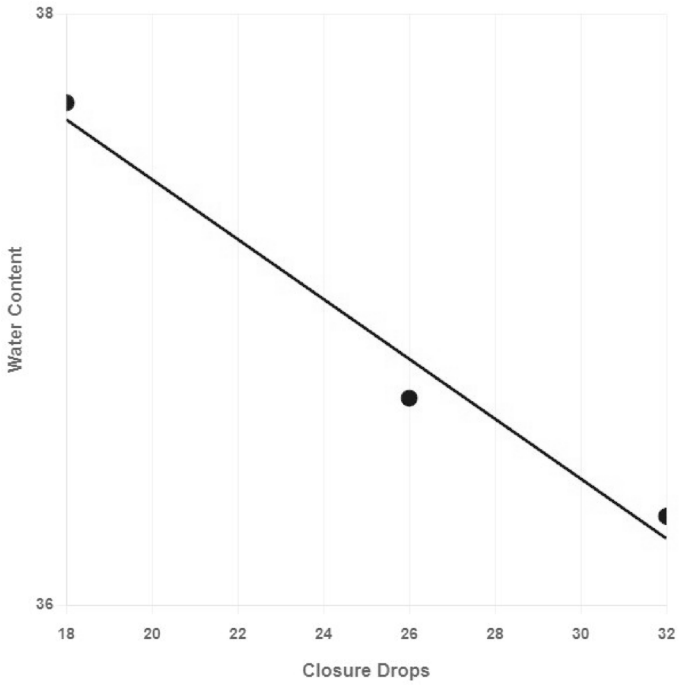
Prepared Sample: Wet

Grooving Tool: Metal

Liquid Limit Method: Method A (Multipoint)

Plastic Limit Procedure: Hand-Rolled

Closure Drops	Water Content
18	37.7
26	36.7
32	36.3



Water Content at 25 Drops: 36.9

Liquid Limit (Method A): **37**

Trial 1 Plastic Limit: 20 **Trial 2 Plastic Limit:** 21 **Average Plastic Limit:** **21**

Plasticity Index: **16**

Test Completed Date: 02/24/2025 **Lab Technician:** Sheri Dauphinais

Atterberg Plasticity Index of Soil

ASTM D4318

Report #: MF0046-000001-00

City of Portland Materials Testing Lab
1405 N River St
Portland, OR 97227
Phone: 503-823-2340

Client:

Bureau of Environmental Services
1120 SW 5TH AVE. RM. 1000
PORTLAND, OR 97204

Project:

E11640 (E11640.W40)
SW 61st Culvert Replacement
1108 SW 61st Ave
Portland, OR

Reviewed By: Andrew Weiher
Date: 02/24/2025

Atterberg Plasticity Index of Soil

ASTM D4318

Report #: MF0046-000002-00

City of Portland Materials Testing Lab
1405 N River St
Portland, OR 97227
Phone: 503-823-2340

Client:

Bureau of Environmental Services
1120 SW 5TH AVE. RM. 1000
PORTLAND, OR 97204

Project:

E11640 (E11640.W40)
SW 61st Culvert Replacement
1108 SW 61st Ave
Portland, OR

Sample Number:	784	**Sample Date:**	02/04/2025
Sample From:	Boring	**Sampling Method:**	Auger Boring ASTM D1452
Boring Number:	B-1	**Depth (ft):**	20-21.5
Technician:	Zoie Yetley		

Max Grain Size (mm): 9.50

As-Received % Moisture: 20.0

Removed #40 Larger Particles: Combination of hand and washing.

% Retain on No. 40 Sieve: 8.5

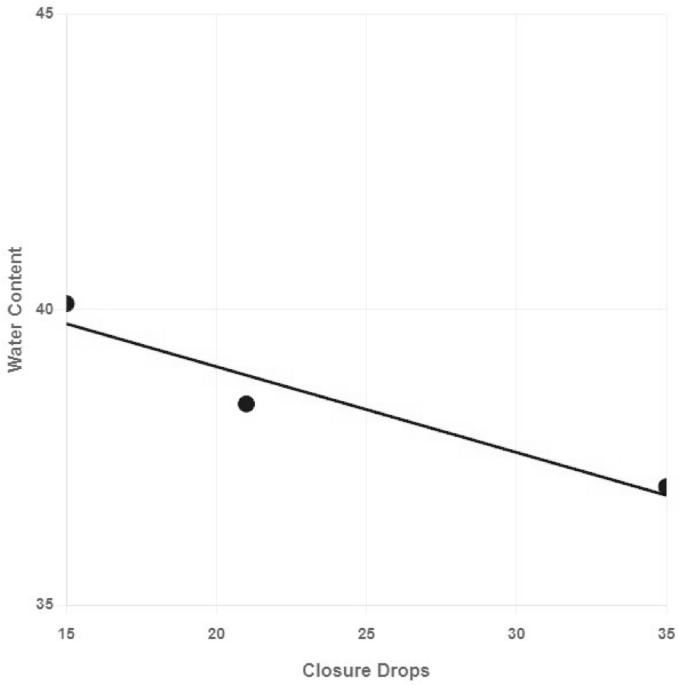
Prepared Sample: Wet

Grooving Tool: Metal

Liquid Limit Method: Method A (Multipoint)

Plastic Limit Procedure: Hand-Rolled

Closure Drops	Water Content
15	40.1
21	38.4
35	37.0



Water Content at 25 Drops: 38.3

Liquid Limit (Method A): **38**

Trial 1 Plastic Limit: 21 **Trial 2 Plastic Limit:** 21 **Average Plastic Limit:** **21**

Plasticity Index: **17**

Test Completed Date: 02/26/2025 **Lab Technician:** Sheri Dauphinais

Atterberg Plasticity Index of Soil

ASTM D4318

Report #: MF0046-000002-00

City of Portland Materials Testing Lab
1405 N River St
Portland, OR 97227
Phone: 503-823-2340

Client:

Bureau of Environmental Services
1120 SW 5TH AVE. RM. 1000
PORTLAND, OR 97204

Project:

E11640 (E11640.W40)
SW 61st Culvert Replacement
1108 SW 61st Ave
Portland, OR

Reviewed By: Viola Lai
Date: 02/27/2025

Atterberg Plasticity Index of Soil

ASTM D4318

Report #: MF0046-000003-00

City of Portland Materials Testing Lab
1405 N River St
Portland, OR 97227
Phone: 503-823-2340

Client:

Bureau of Environmental Services
1120 SW 5TH AVE. RM. 1000
PORTLAND, OR 97204

Project:

E11640 (E11640.W40)
SW 61st Culvert Replacement
1108 SW 61st Ave
Portland, OR

Sample Number:	786	**Sample Date:**	02/04/2025
Sample From:	Boring	**Sampling Method:**	Auger Boring ASTM D1452
Boring Number:	B-1	**Depth (ft):**	30-31.5
Technician:	Zoie Yetley		

Max Grain Size (mm): 2.00

As-Received % Moisture: 71.0

Removed #40 Larger Particles: Combination of hand and washing.

% Retain on No. 40 Sieve: 4.0

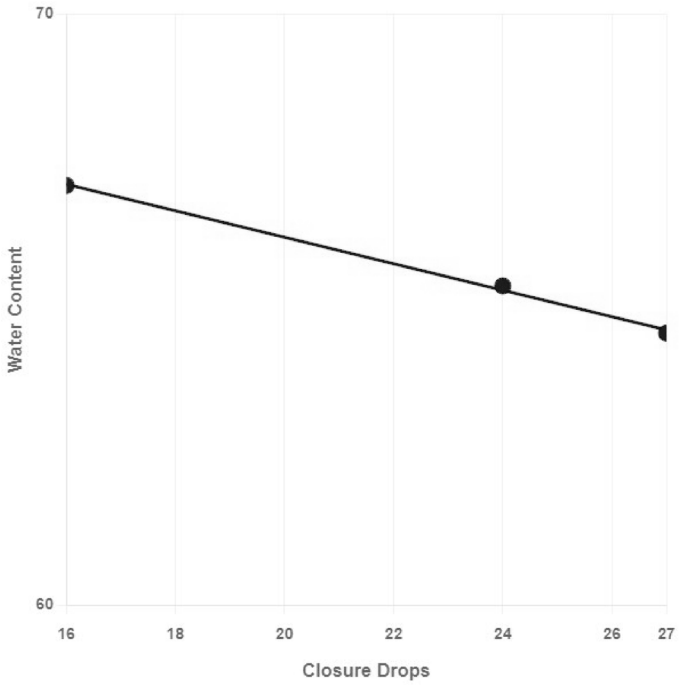
Prepared Sample: Wet

Grooving Tool: Metal

Liquid Limit Method: Method A (Multipoint)

Plastic Limit Procedure: Hand-Rolled

Closure Drops	Water Content
27	64.6
24	65.4
16	67.1



Water Content at 25 Drops: 65.1

Liquid Limit (Method A): **65**

Trial 1 Plastic Limit: 39 **Trial 2 Plastic Limit:** 40 **Average Plastic Limit:** **40**

Plasticity Index: **25**

Test Completed Date: 02/26/2025 **Lab Technician:** Sheri Dauphinais

Atterberg Plasticity Index of Soil

ASTM D4318

Report #: MF0046-000003-00

City of Portland Materials Testing Lab
1405 N River St
Portland, OR 97227
Phone: 503-823-2340

Client:

Bureau of Environmental Services
1120 SW 5TH AVE. RM. 1000
PORTLAND, OR 97204

Project:

E11640 (E11640.W40)
SW 61st Culvert Replacement
1108 SW 61st Ave
Portland, OR

Reviewed By: Viola Lai
Date: 02/27/2025

Atterberg Plasticity Index of Soil

ASTM D4318

Report #: MF0046-000004-00

City of Portland Materials Testing Lab
1405 N River St
Portland, OR 97227
Phone: 503-823-2340

Client:

Bureau of Environmental Services
1120 SW 5TH AVE. RM. 1000
PORTLAND, OR 97204

Project:

E11640 (E11640.W40)
SW 61st Culvert Replacement
1108 SW 61st Ave
Portland, OR

Sample Number:	781	**Sample Date:**	02/04/2025
Sample From:	Boring	**Sampling Method:**	Auger Boring ASTM D1452
Boring Number:	B-1	**Depth (ft):**	5-6.5
Technician:	Zoie Yetley		

Max Grain Size (mm): 2.00

As-Received % Moisture: 31.0

Removed #40 Larger Particles: Combination of hand and washing.

% Retain on No. 40 Sieve: 0.1

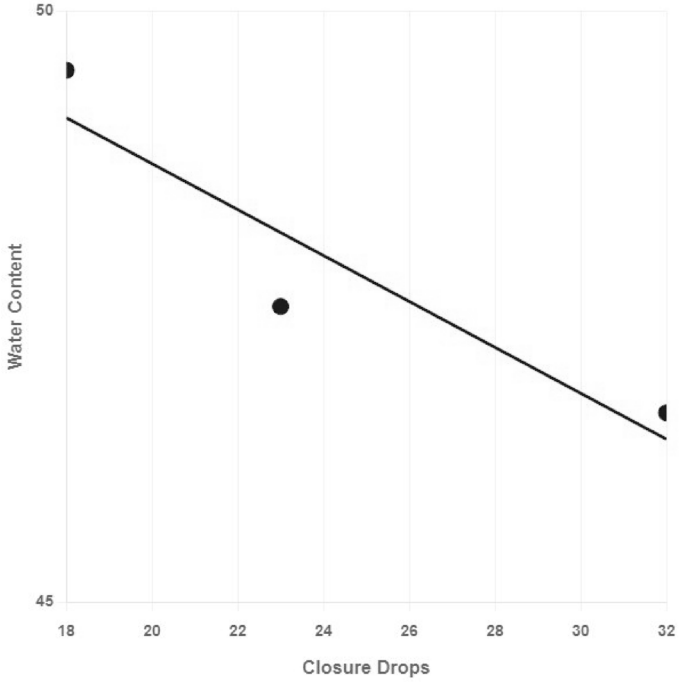
Prepared Sample: Wet

Grooving Tool: Metal

Liquid Limit Method: Method A (Multipoint)

Plastic Limit Procedure: Hand-Rolled

Closure Drops	Water Content
32	46.6
23	47.5
18	49.5



Water Content at 25 Drops: 47.7

Liquid Limit (Method A): **48**

Trial 1 Plastic Limit: 23 **Trial 2 Plastic Limit:** 24 **Average Plastic Limit:** **24**

Plasticity Index: **24**

Test Completed Date: 02/27/2025 **Lab Technician:** Sheri Dauphinais

Atterberg Plasticity Index of Soil

ASTM D4318

Report #: MF0046-000004-00

City of Portland Materials Testing Lab
1405 N River St
Portland, OR 97227
Phone: 503-823-2340

Client:

Bureau of Environmental Services
1120 SW 5TH AVE. RM. 1000
PORTLAND, OR 97204

Project:

E11640 (E11640.W40)
SW 61st Culvert Replacement
1108 SW 61st Ave
Portland, OR

Reviewed By: Viola Lai
Date: 02/28/2025

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Level 2
Environmental Report

MEMORANDUM

Date: February 20, 2025

To: Chris Lastomirsky - BES Surface Water Restoration

From: Keir Allison-Bourne - BES CSA Program

CC: Brian Marcum, P.E. – BES CSA Program

RE: E11640 **–** SW 61st Culvert Replacement - Level 2 ESA

1. BACKGROUND AND PURPOSE

The City of Portland's Bureau of Environmental Services (BES), Coordinated Site Assessment (CSA) program was requested to conduct a Level 2 Environmental Site Assessment (ESA) for the SW 61st Culvert Replacement project; BES Project E11640. The project's objective is to increase the capacity of the culvert crossing (BES Asset ID: ADJ218-ADJ217) by replacing the 24" culvert on SW 61st with a 30" culvert due to it causing private property flooding.

The primary purpose of this environmental assessment is to evaluate planned excavation spoils in the project area for potential contamination. The results are used to characterize soil for disposal purposes and to evaluate soil for worker exposure with respect to Oregon Department of Environmental Quality (DEQ), Clean Fill Screening Levels (CFSLs), and Risk-Based Concentrations (RBCs) for construction and excavation workers.

The Level 1 ESA for this project (dated December 18th, 2024) was reviewed to identify historical features of concern, recognized environmental conditions, and to determine appropriate sample procedures, health and safety measures, chemical testing methods, and quality assurance/quality control procedures.

2. SAMPLE COLLECTION

On January 31, 2025, CSA program staff collected a total of two soil samples from one soil boring within the project area. The soil samples were labeled B-1-1 and B-1-2. Sample B-1-1 was advanced to a depth of 2.5 to 4 feet below ground surface (bgs) and sample B-1-2 was advanced to a depth of 7.5 to 9 feet bgs. The sample location is shown on **Figure 1**.

Soil samples were collected using a truck-mounted hollow stem auger drilling rig with a Modified California split-spoon sampler. Each sample was composited in a decontaminated stainless-steel bowl and packed into 4-oz. amber glass jars with Teflon-lined lids. Field sampling personnel donned new Nitrile gloves to collect each sample. Sample jars were labeled, packed into chilled coolers, and transported under chain-of-custody protocol to the City of Portland Water Pollution Control Laboratory (WPCL) for analysis. Sampling was conducted concurrent

with a geotechnical investigation conducted by the BES Material Testing Laboratory (MTL). MTL's findings including soil boring logs are presented under separate cover.

3. LABORATORY ANALYSIS

Samples were analyzed for the following compounds by the laboratory methods specified:

- Total Metals (Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and Silver) by Environmental Protection Agency (EPA) Method 6020.
- Hydrocarbon Identification by NWTPH-HCID.
- Polycyclic Aromatic Hydrocarbons (PAHs) by EPA Method 8270-SIM.

4. ANALYTICAL RESULTS

Soil sample results were screened against the DEQ CSFLs for uplands in the Portland Basin (DEQ 2019) and the DEQ RBCs for the soil ingestion, dermal contact, and inhalation exposure pathway for the construction and excavation workers (DEQ 2023). Results are discussed in the following sections. Analytical results were evaluated against DEQ screening criteria and are presented in **Table 1** and **Table 2**. The laboratory reports are provided in **Attachment A.**

TOTAL METALS

Detected metals in samples B-1-1 and B-1-2 were below applicable CSFLs and detections were below RBCs for the construction worker receptor scenario.

HYDROCARBON IDENTIFICATION

Sample B-1-1 had a detection of lube oil below CSFLs and applicable RBCs. No other samples for this project had detections of above their respective laboratory method reporting limits (MRLs).

POLYCYCLIC AROMATIC HYDROCARBONS

Sample B-1-1 had detections of PAHs below CSFLs and applicable RBCs.

5. SUMMARY

Based on the results of this Level 2 ESA, the CSA program has the following recommendations:

SOIL DISPOSAL

No detections were above CSFLs. Soil excavated for this project can be considered clean fill.

WORKER HEALTH AND SAFETY

No detections were above RBCs. The contractor should evaluate the results and take them into consideration when preparing the Site-Specific Safety and Health Plan.

UNANTICIPATED CONTAMINATED MEDIA

If any unanticipated contaminated media (identified by odor, sheen, or other field test) or undocumented fill (containing construction or household debris) is encountered during field activities, please contact the CSA program immediately and follow City of Portland Standard Construction Specification 00291.45. Any material removed from the site having a chemical odor, staining, or sheen will require disposal at an approved landfill.

6. LIMITATIONS

The purpose of this investigation is to report the findings of sampling and analysis. The samples collected only indicate the presence or absence of contaminants in the samples collected. Contamination may exist in areas not sampled. The focus of the investigation is on hazardous substances likely associated with the historical activities conducted within the subject site. In this context, the term hazardous substance includes the chemicals listed as hazardous substances in the Code of Federal Regulations, Oregon Administrative Rules, and petroleum products. This survey is in effect as of February 20, 2025.

7. REFERENCES

DEQ. June 2023. *Risk-Based Concentrations for Individual Chemicals*.

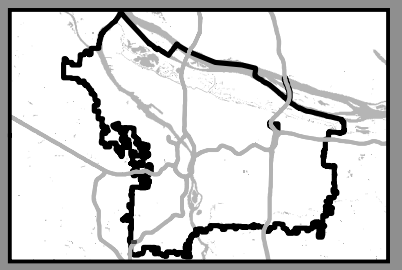
DEQ. February 2019. *Internal Management Directive: Clean Fill Determinations*.

DEQ. March 2013. *Development of Oregon Background Metals Concentrations in Soil.*

Enclosures

Figure 1	Soil Boring Location
Table 1	Total Metals and Hydrocarbons Analytical Results
Table 2	Polycyclic Aromatic Hydrocarbons Analytical Results
Attachment A	Laboratory Analytical Reports

FIGURES



E11640 - SW 61st Ave Culvert Replacement

Figure 1. Soil Boring

Map Created by: Keir Allison-Bourne
February 20, 2025

Soil Boring
Project Boundary
Culvert Outlets
Culvert

N

0 5 10 20 30
Feet

5

Map Produced in ArcMap

TABLES

Table 1. Total Metals and Hydrocarbons Analytical Results

Field Sample ID	Depth Interval (feet bgs)	Lab Sample ID	Collection Date	Total Petroleum Hydrocarbons (TPH) (mg/kg)			Total Metals (mg/kg)							
				Diesel	Lube Oil	Gasoline	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
B-1-1	2.5 - 4	W25B014-01	1/31/2025 9:00	ND	**190**	ND	**1.57**	**159**	**0.083**	**31.2**	**9.13**	**0.0163**	ND	ND
B-1-2	7.5 - 9	W25B014-02	1/31/2025 9:10	ND	ND	ND	**3.7**	**142**	ND	**34.8**	**7.17**	**0.0126**	ND	ND
DEQ Clean Fill Screening Values														
DEQ Clean Fill Screening Values				1100	2800	31	8.8	790	0.63	76	28	0.23	0.71	0.82
DEQ Risk Based Concentrations														
Construction Worker - ingestion, contact, and inhalation				4600	11000	9700	15	69,000	350	530,000	800	110	N/A	1800
Excavation Worker - ingestion, contact, and inhalation				>MAX	>MAX	>MAX	420	>MAX	9700	N/A	800	2900	N/A	49000

Notes:

DEQ = Oregon Department of Environmental Quality

mg/kg = milligrams per kilogram

ND = not detected (method reporting limit)

NA = not available or not applicable

feet bgs = feet below ground surface

>MAX = The constituent RBC for this pathway is calclulated as greater than 1,000,000 mg/kg or 1,000,000 mg/L.

--- = Sample was not analyzed for this constituent.

Bold values = detected concentrations

Red Text = concentrations detected above DEQs Clean Fill Screening Level

Table 2. Summary of Polycyclic Aromatic Hydrocarbons (PAHs) Analytical Results

Field Sample ID	Depth Interval (feet bgs)	Lab Sample ID	Collection Date	Polycyclic Aromatic Hydrocarbons (ug/kg dry)															
				Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
B-1-1	2.5-4'	W25B014-01	1/31/2025 9:00	ND	ND	ND	ND	ND	ND	**33**	ND	ND	ND	ND	ND	ND	ND	ND	**21**
DEQ Clean Fill Screening Values (ug/kg)																			
DEQ Clean Fill Screening Values				250	120,000	6,800	730	110	1100	25000	11000	3100	110	10000	3700	1100	7.7	5500	10000
DEQ Risk Based Concentrations (ug/kg)																			
Construction Worker - ingestion, contact, and inhalation				2.10E+07	NA	1.10E+08	1.70E+05	1.70E+04	1.70E+05	NA	1.70E+06	1.70E+07	1.70E+04	1.00E+07	1.40E+07	NA	5.80E+05	NA	7.50E+06
Excavation Worker - ingestion, contact, and inhalation				5.90E+08	NA	>MAX	4.80E+06	4.90E+05	4.90E+06	NA	4.90E+07	4.90E+08	4.90E+05	2.80E+08	3.90E+08	NA	1.60E+07	NA	2.10E+08

Notes:

DEQ = Oregon Department of Environmental Quality

ug/kg = micrograms per kilogram

ND = not detected (method reporting limit)

NA = not available or not applicable

feet bgs = feet below ground surface

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

--- = Sample was not analyzed for this constituent.

Bold values = detected concentrations

Red Text = concentrations detected above DEQs Clean Fill Screening Level

ATTACHMENT A

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

LABORATORY ANALYSIS REPORT

Project:	**SW 61st Culvert Replacement**	Client:	Coordinated Site Analysis
Work Order:	**W25B014**	Project Mgr:	John O'Donovan
Received:	1/31/25 14:00		
Submitted By:	CSA		

Sample	Laboratory ID	Matrix	Type	Sample Collection Date Start	End	Qualifier
B-1-1 (2.5-4)	W25B014-01	Soil	Composite	01/31/25 09:00	01/31/25 09:00	
B-1-2 (7.5-9)	W25B014-02	Soil	Composite	01/31/25 09:10	01/31/25 09:10	

General Chemistry

Total Solids

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
B-1-1 (2.5-4) : W25B014-01									
Total solids	**80.2**	% W/W	0.02		B25B063	02/05/25	02/06/25	SM 2540G	
B-1-2 (7.5-9) : W25B014-02									
Total solids	**77.8**	% W/W	0.02		B25B063	02/05/25	02/06/25	SM 2540G	

Total Metals

Total Metals by ICPMS

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
B-1-1 (2.5-4) : W25B014-01									
Arsenic	**1.57**	mg/kg dry	0.073	20	B25B047	02/04/25	02/05/25	EPA 6020	
Barium	**159**	mg/kg dry	1.46	20	B25B047	02/04/25	02/05/25	EPA 6020	
Cadmium	**0.083**	mg/kg dry	0.073	20	B25B047	02/04/25	02/05/25	EPA 6020	
Chromium	**31.2**	mg/kg dry	0.583	20	B25B047	02/04/25	02/05/25	EPA 6020	
Lead	**9.13**	mg/kg dry	0.292	20	B25B047	02/04/25	02/05/25	EPA 6020	
Mercury	**0.0163**	mg/kg dry	0.0109	20	B25B047	02/04/25	02/05/25	EPA 6020	
Selenium	ND	mg/kg dry	1.46	20	B25B047	02/04/25	02/05/25	EPA 6020	
Silver	ND	mg/kg dry	0.073	20	B25B047	02/04/25	02/05/25	EPA 6020	
B-1-2 (7.5-9) : W25B014-02									
Arsenic	**3.70**	mg/kg dry	0.074	20	B25B047	02/04/25	02/05/25	EPA 6020	
Barium	**142**	mg/kg dry	1.48	20	B25B047	02/04/25	02/05/25	EPA 6020	
Cadmium	ND	mg/kg dry	0.074	20	B25B047	02/04/25	02/05/25	EPA 6020	
Chromium	**34.8**	mg/kg dry	0.591	20	B25B047	02/04/25	02/05/25	EPA 6020	
Lead	**7.17**	mg/kg dry	0.295	20	B25B047	02/04/25	02/05/25	EPA 6020	
Mercury	**0.0126**	mg/kg dry	0.0111	20	B25B047	02/04/25	02/05/25	EPA 6020	
Selenium	ND	mg/kg dry	1.48	20	B25B047	02/04/25	02/05/25	EPA 6020	
Silver	ND	mg/kg dry	0.074	20	B25B047	02/04/25	02/05/25	EPA 6020	

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Water Pollution Control Laboratory
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ORELAP Certification ID 4023

Project:	**SW 61st Culvert Replacement**	Client:	Coordinated Site Analysis
Work Order:	**W25B014**	Received:	01/31/25 14:00

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Fuels									
Diesel/Oil Hydrocarbons by GC-FID									
B-1-1 (2.5-4) : W25B014-01									F7
Diesel	ND	mg/kg dry	27	1	B25B104	02/06/25	02/07/25	NWTPH-Dx	
Lube oil	**190**	mg/kg dry	53	1	B25B104	02/06/25	02/07/25	NWTPH-Dx	
Surrogate	***Result***		***Expected***	***%Rec***	***Limits(%)***				
o-Terphenyl	*21.8*	mg/kg dry	*21.3*	*102%*	*50-150*	*B25B104*	*02/06/25*	*02/07/25*	*NWTPH-Dx*
Hydrocarbon Scan by GC-FID									
B-1-1 (2.5-4) : W25B014-01									
Gasoline	ND	mg/kg dry	21	1	B25B040	02/04/25	02/04/25	NWTPH-HCID	
Diesel	ND	mg/kg dry	53	1	B25B040	02/04/25	02/04/25	NWTPH-HCID	
Lube oil	**DET**	mg/kg dry	106	1	B25B040	02/04/25	02/04/25	NWTPH-HCID	
Surrogate	***Result***		***Expected***	***%Rec***	***Limits(%)***				
o-Terphenyl	*11.3*	mg/kg dry	*10.6*	*107%*	*50-150*	*B25B040*	*02/04/25*	*02/04/25*	*NWTPH-HCID*
B-1-2 (7.5-9) : W25B014-02									
Gasoline	ND	mg/kg dry	21	1	B25B040	02/04/25	02/04/25	NWTPH-HCID	
Diesel	ND	mg/kg dry	54	1	B25B040	02/04/25	02/04/25	NWTPH-HCID	
Lube oil	ND	mg/kg dry	107	1	B25B040	02/04/25	02/04/25	NWTPH-HCID	
Surrogate	***Result***		***Expected***	***%Rec***	***Limits(%)***				
o-Terphenyl	*10.8*	mg/kg dry	*10.7*	*100%*	*50-150*	*B25B040*	*02/04/25*	*02/04/25*	*NWTPH-HCID*
Semivolatile Organics - SIM									
Polynuclear Aromatic Hydrocarbons by GCMS-SIM									
B-1-1 (2.5-4) : W25B014-01									
Acenaphthene	ND	ug/kg dry	43	20	B25B104	02/06/25	02/12/25	EPA 8270-SIM	
Acenaphthylene	ND	ug/kg dry	43	20	B25B104	02/06/25	02/12/25	EPA 8270-SIM	
Anthracene	ND	ug/kg dry	43	20	B25B104	02/06/25	02/12/25	EPA 8270-SIM	
Benzo(a)anthracene	ND	ug/kg dry	21	20	B25B104	02/06/25	02/12/25	EPA 8270-SIM	
Benzo(a)pyrene	ND	ug/kg dry	21	20	B25B104	02/06/25	02/12/25	EPA 8270-SIM	
Benzo(b)fluoranthene	ND	ug/kg dry	21	20	B25B104	02/06/25	02/12/25	EPA 8270-SIM	
Benzo(g,h,i)perylene	**33**	ug/kg dry	21	20	B25B104	02/06/25	02/12/25	EPA 8270-SIM	
Benzo(k)fluoranthene	ND	ug/kg dry	21	20	B25B104	02/06/25	02/12/25	EPA 8270-SIM	
Chrysene	ND	ug/kg dry	21	20	B25B104	02/06/25	02/12/25	EPA 8270-SIM	
Dibenzo(a,h)anthracene	ND	ug/kg dry	21	20	B25B104	02/06/25	02/12/25	EPA 8270-SIM	
Fluoranthene	ND	ug/kg dry	21	20	B25B104	02/06/25	02/12/25	EPA 8270-SIM	
Fluorene	ND	ug/kg dry	43	20	B25B104	02/06/25	02/12/25	EPA 8270-SIM	
Indeno(1,2,3-cd)pyrene	ND	ug/kg dry	21	20	B25B104	02/06/25	02/12/25	EPA 8270-SIM	
Naphthalene	ND	ug/kg dry	85	20	B25B104	02/06/25	02/12/25	EPA 8270-SIM	
Phenanthrene	ND	ug/kg dry	43	20	B25B104	02/06/25	02/12/25	EPA 8270-SIM	
Pyrene	**21**	ug/kg dry	21	20	B25B104	02/06/25	02/12/25	EPA 8270-SIM	
Surrogate	***Result***		***Expected***	***%Rec***	***Limits(%)***				
2-Methylnaphthalene-d10	*98*	ug/kg dry	*107*	*92%*	*31-129*	*B25B104*	*02/06/25*	*02/12/25*	*EPA 8270-SIM*
Fluoranthene-d10	*100*	ug/kg dry	*107*	*97%*	*63-132*	*B25B104*	*02/06/25*	*02/12/25*	*EPA 8270-SIM*

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Project:	**SW 61st Culvert Replacement**	Client:	Coordinated Site Analysis
Work Order:	**W25B014**	Received:	01/31/25 14:00

Quality Control Report

General Chemistry - QC

Analyte	Result	Units	MRL	Spike Level	Source Result	%Rec *(Limits)*	RPD *(Limit)*	Prepared: Analyzed	Qualifier
Total Solids - Batch B25B063									
Blank (B25B063-BLK1)									
Total solids	ND	% W/W	0.02					02/05/25 :02/06/25	
Duplicate (B25B063-DUP1)			**Source: W25B013-01**						
Total solids	**81.7**	% W/W	0.02		82.3		0.8 (5)	02/05/25 :02/06/25	
Duplicate (B25B063-DUP2)			**Source: W25B015-04**						
Total solids	**76.8**	% W/W	0.02		77.1		0.4 (5)	02/05/25 :02/06/25	

Total Metals - QC

Analyte	Result	Units	MRL	Spike Level	Source Result	%Rec *(Limits)*	RPD *(Limit)*	Prepared: Analyzed	Qualifier
Total Metals by ICPMS - Batch B25B047									
Blank (B25B047-BLK1)									
Arsenic	ND	mg/kg wet	0.025					02/04/25 :02/05/25	
Barium	ND	mg/kg wet	0.500					02/04/25 :02/05/25	
Cadmium	ND	mg/kg wet	0.025					02/04/25 :02/05/25	
Chromium	ND	mg/kg wet	0.200					02/04/25 :02/05/25	
Lead	ND	mg/kg wet	0.100					02/04/25 :02/05/25	
Mercury	ND	mg/kg wet	0.00375					02/04/25 :02/05/25	
Selenium	ND	mg/kg wet	0.500					02/04/25 :02/05/25	
Silver	ND	mg/kg wet	0.025					02/04/25 :02/05/25	
Standard Reference Material (B25B047-SRM1)									
Arsenic	**187**	mg/kg wet	1.06	202		93% *(75-125)*		02/04/25 :02/05/25	
Barium	**568**	mg/kg wet	21.2	665		85% *(75-125)*		02/04/25 :02/05/25	
Cadmium	**237**	mg/kg wet	1.06	267		89% *(75-125)*		02/04/25 :02/05/25	
Chromium	**139**	mg/kg wet	8.47	159		88% *(75-125)*		02/04/25 :02/05/25	
Lead	**119**	mg/kg wet	4.24	132		90% *(75-125)*		02/04/25 :02/05/25	
Mercury	**4.14**	mg/kg wet	0.159	4.99		83% *(75-125)*		02/04/25 :02/05/25	
Selenium	**224**	mg/kg wet	21.2	261		86% *(75-125)*		02/04/25 :02/05/25	
Silver	**44.3**	mg/kg wet	1.06	48.2		92% *(75-125)*		02/04/25 :02/05/25	
Duplicate (B25B047-DUP1)			**Source: W25B014-02**						
Arsenic	**3.74**	mg/kg dry	0.074		3.70		1 (20)	02/04/25 :02/05/25	
Barium	**144**	mg/kg dry	1.49		142		0.8 (20)	02/04/25 :02/05/25	
Cadmium	ND	mg/kg dry	0.074		ND		(20)	02/04/25 :02/05/25	
Chromium	**34.5**	mg/kg dry	0.594		34.8		0.9 (20)	02/04/25 :02/05/25	

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Project:	**SW 61st Culvert Replacement**	Client:	Coordinated Site Analysis
Work Order:	**W25B014**	Received:	01/31/25 14:00

Total Metals - QC

Analyte	Result	Units	MRL	Spike Level	Source Result	%Rec *(Limits)*	RPD *(Limit)*	Prepared: Analyzed	Qualifier
Total Metals by ICPMS - Batch B25B047									
Duplicate (B25B047-DUP1)			**Source: W25B014-02**						
Lead	**7.24**	mg/kg dry	0.297		7.17		1 (20)	02/04/25 :02/05/25	
Mercury	**0.0125**	mg/kg dry	0.0111		0.0126		0.7 (20)	02/04/25 :02/05/25	
Selenium	ND	mg/kg dry	1.49		ND		(20)	02/04/25 :02/05/25	
Silver	ND	mg/kg dry	0.074		ND		(20)	02/04/25 :02/05/25	
Matrix Spike (B25B047-MS1)			**Source: W25B014-02**						
Arsenic	**16.9**	mg/kg dry	0.185	14.8	3.70	89% *(75-125)*		02/04/25 :02/05/25	
Barium	**357**	mg/kg dry	3.69	222	142	97% *(75-125)*		02/04/25 :02/05/25	
Cadmium	**14.2**	mg/kg dry	0.185	14.8	ND	96% *(75-125)*		02/04/25 :02/05/25	
Chromium	**74.4**	mg/kg dry	1.48	44.3	34.8	89% *(75-125)*		02/04/25 :02/05/25	
Lead	**75.6**	mg/kg dry	0.739	73.9	7.17	93% *(75-125)*		02/04/25 :02/05/25	
Mercury	**0.738**	mg/kg dry	0.0277	0.739	ND	100% *(75-125)*		02/04/25 :02/05/25	
Selenium	**65.9**	mg/kg dry	3.69	73.9	ND	89% *(75-125)*		02/04/25 :02/05/25	
Silver	**14.3**	mg/kg dry	0.185	14.8	ND	97% *(75-125)*		02/04/25 :02/05/25	

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Project:	**SW 61st Culvert Replacement**	Client:	Coordinated Site Analysis
Work Order:	**W25B014**	Received:	01/31/25 14:00

Fuels - QC

Analyte	Result	Units	MRL	Spike Level	Source Result	%Rec *(Limits)*	RPD *(Limit)*	Prepared: Analyzed	Qualifier
Diesel/Oil Hydrocarbons by GC-FID - Batch B25B104									
Blank (B25B104-BLK2)									F7
Diesel	ND	mg/kg wet	25					02/06/25 :02/07/25	
Lube oil	ND	mg/kg wet	50					02/06/25 :02/07/25	
Surrogate									
o-Terphenyl	*21.9*	mg/kg wet		*20.0*		110% *(50-150)*		02/06/25 :02/07/25	
LCS (B25B104-BS2)									F7
Diesel	**238**	mg/kg wet	25	250		95% *(50-150)*		02/06/25 :02/07/25	
Lube oil	**218**	mg/kg wet	50	250		87% *(50-150)*		02/06/25 :02/07/25	
Surrogate									
o-Terphenyl	*25.2*	mg/kg wet		*20.0*		126% *(50-150)*		02/06/25 :02/07/25	
Duplicate (B25B104-DUP2)			**Source: W25A228-14**						F7
Diesel	**47.4**	mg/kg dry	23		63.6		29 (50)	02/06/25 :02/07/25	F13
Lube oil	**50.3**	mg/kg dry	45		119		81 (50)	02/06/25 :02/07/25	M1
Surrogate									
o-Terphenyl	*18.9*	mg/kg dry		*18.1*		104% *(50-150)*		02/06/25 :02/07/25	
Duplicate (B25B104-DUP3)			**Source: W25B067-05**						F7
Diesel	ND	mg/kg dry	250		ND		(50)	02/06/25 :02/07/25	
Lube oil	**1010**	mg/kg dry	490		870		15 (50)	02/06/25 :02/07/25	
Surrogate									
o-Terphenyl	*24.7*	mg/kg dry		*19.8*		125% *(50-150)*		02/06/25 :02/07/25	
Hydrocarbon Scan by GC-FID - Batch B25B040									
Blank (B25B040-BLK1)									
Gasoline	ND	mg/kg wet	17					02/04/25 :02/04/25	
Diesel	ND	mg/kg wet	42					02/04/25 :02/04/25	
Lube oil	ND	mg/kg wet	83					02/04/25 :02/04/25	
Surrogate									
o-Terphenyl	*8.74*	mg/kg wet		*8.33*		105% *(50-150)*		02/04/25 :02/04/25	
Duplicate (B25B040-DUP1)			**Source: W25B013-01**						
Gasoline	ND	mg/kg dry	21		ND			02/04/25 :02/04/25	
Diesel	ND	mg/kg dry	51		ND			02/04/25 :02/04/25	
Lube oil	ND	mg/kg dry	103		ND			02/04/25 :02/04/25	
Surrogate									
o-Terphenyl	*10.7*	mg/kg dry		*10.3*		104% *(50-150)*		02/04/25 :02/04/25	
Duplicate (B25B040-DUP2)			**Source: W25B017-01**						
Gasoline	ND	mg/kg dry	21		ND			02/04/25 :02/04/25	
Diesel	ND	mg/kg dry	54		ND			02/04/25 :02/04/25	
Lube oil	ND	mg/kg dry	107		ND			02/04/25 :02/04/25	
Surrogate									
o-Terphenyl	*11.5*	mg/kg dry		*10.7*		107% *(50-150)*		02/04/25 :02/04/25	

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Project:	**SW 61st Culvert Replacement**	Client:	Coordinated Site Analysis
Work Order:	**W25B014**	Received:	01/31/25 14:00

Semivolatile Organics - SIM - QC

Analyte	Result	Units	MRL	Spike Level	Source Result	%Rec *(Limits)*	RPD *(Limit)*	Prepared: Analyzed	Qualifier
Polynuclear Aromatic Hydrocarbons by GCMS-SIM - Batch B25B104									
Blank (B25B104-BLK1)									
Acenaphthene	ND	ug/kg wet	20					02/06/25 :02/12/25	
Acenaphthylene	ND	ug/kg wet	20					02/06/25 :02/12/25	
Anthracene	ND	ug/kg wet	20					02/06/25 :02/12/25	
Benzo(a)anthracene	ND	ug/kg wet	10					02/06/25 :02/12/25	
Benzo(a)pyrene	ND	ug/kg wet	10					02/06/25 :02/12/25	
Benzo(b)fluoranthene	ND	ug/kg wet	10					02/06/25 :02/12/25	
Benzo(g,h,i)perylene	ND	ug/kg wet	10					02/06/25 :02/12/25	
Benzo(k)fluoranthene	ND	ug/kg wet	10					02/06/25 :02/12/25	
Chrysene	ND	ug/kg wet	10					02/06/25 :02/12/25	
Dibenzo(a,h)anthracene	ND	ug/kg wet	10					02/06/25 :02/12/25	
Fluoranthene	ND	ug/kg wet	10					02/06/25 :02/12/25	
Fluorene	ND	ug/kg wet	20					02/06/25 :02/12/25	
Indeno(1,2,3-cd)pyrene	ND	ug/kg wet	10					02/06/25 :02/12/25	
Naphthalene	ND	ug/kg wet	40					02/06/25 :02/12/25	
Phenanthrene	ND	ug/kg wet	20					02/06/25 :02/12/25	
Pyrene	ND	ug/kg wet	10					02/06/25 :02/12/25	
Surrogate									
2-Methylnaphthalene-d10	*75*	ug/kg wet		*100*		75% *(31-129)*		02/06/25 :02/12/25	
Fluoranthene-d10	*96*	ug/kg wet		*100*		96% *(63-132)*		02/06/25 :02/12/25	
LCS (B25B104-BS1)									
Acenaphthene	**47.2**	ug/kg wet	20	50.0		94% *(49-122)*		02/06/25 :02/12/25	
Acenaphthylene	**50.4**	ug/kg wet	20	50.0		101% *(51-123)*		02/06/25 :02/12/25	
Anthracene	**47.6**	ug/kg wet	20	50.0		95% *(62-115)*		02/06/25 :02/12/25	
Benzo(a)anthracene	**47.6**	ug/kg wet	10	50.0		95% *(63-112)*		02/06/25 :02/12/25	
Benzo(a)pyrene	**47.6**	ug/kg wet	10	50.0		95% *(62-117)*		02/06/25 :02/12/25	
Benzo(b)fluoranthene	**46.8**	ug/kg wet	10	50.0		94% *(53-117)*		02/06/25 :02/12/25	
Benzo(g,h,i)perylene	**43.6**	ug/kg wet	10	50.0		87% *(42-128)*		02/06/25 :02/12/25	
Benzo(k)fluoranthene	**47.2**	ug/kg wet	10	50.0		94% *(53-124)*		02/06/25 :02/12/25	
Chrysene	**47.6**	ug/kg wet	10	50.0		95% *(63-119)*		02/06/25 :02/12/25	
Dibenzo(a,h)anthracene	**43.6**	ug/kg wet	10	50.0		87% *(44-129)*		02/06/25 :02/12/25	
Fluoranthene	**50.0**	ug/kg wet	10	50.0		100% *(63-115)*		02/06/25 :02/12/25	
Fluorene	**46.0**	ug/kg wet	20	50.0		92% *(58-113)*		02/06/25 :02/12/25	
Indeno(1,2,3-cd)pyrene	**44.8**	ug/kg wet	10	50.0		90% *(46-127)*		02/06/25 :02/12/25	
Naphthalene	**51.6**	ug/kg wet	40	50.0		103% *(37-118)*		02/06/25 :02/12/25	
Phenanthrene	**48.8**	ug/kg wet	20	50.0		98% *(49-119)*		02/06/25 :02/12/25	
Pyrene	**51.2**	ug/kg wet	10	50.0		102% *(63-117)*		02/06/25 :02/12/25	
Surrogate									
2-Methylnaphthalene-d10	*89*	ug/kg wet		*100*		89% *(31-129)*		02/06/25 :02/12/25	
Fluoranthene-d10	*110*	ug/kg wet		*100*		112% *(63-132)*		02/06/25 :02/12/25	
Duplicate (B25B104-DUP1)					**Source: W25A228-14**				

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Project:	**SW 61st Culvert Replacement**	Client:	Coordinated Site Analysis
Work Order:	**W25B014**	Received:	01/31/25 14:00

Semivolatile Organics - SIM - QC

Analyte	Result	Units	MRL	Spike Level	Source Result	%Rec *(Limits)*	RPD *(Limit)*	Prepared: Analyzed	Qualifier
Polynuclear Aromatic Hydrocarbons by GCMS-SIM - Batch B25B104									
Duplicate (B25B104-DUP1)			**Source: W25A228-14**						
Acenaphthene	ND	ug/kg dry	18		ND		(30)	02/06/25 :02/12/25	
Acenaphthylene	ND	ug/kg dry	18		ND		(30)	02/06/25 :02/12/25	
Anthracene	ND	ug/kg dry	18		19.6		(30)	02/06/25 :02/12/25	
Benzo(a)anthracene	**68.9**	ug/kg dry	9.1		96.2		33 (30)	02/06/25 :02/12/25	M3
Benzo(a)pyrene	**64.5**	ug/kg dry	9.1		83.5		26 (30)	02/06/25 :02/12/25	
Benzo(b)fluoranthene	**68.5**	ug/kg dry	9.1		129		61 (30)	02/06/25 :02/12/25	M3
Benzo(g,h,i)perylene	**46.7**	ug/kg dry	9.1		71.5		42 (30)	02/06/25 :02/12/25	M3
Benzo(k)fluoranthene	**19.6**	ug/kg dry	9.1		34.1		54 (30)	02/06/25 :02/12/25	M3
Chrysene	**86.2**	ug/kg dry	9.1		151		55 (30)	02/06/25 :02/12/25	M3
Dibenzo(a,h)anthracene	**12.7**	ug/kg dry	9.1		19.6		43 (30)	02/06/25 :02/12/25	M3
Fluoranthene	**92.0**	ug/kg dry	9.1		163		55 (30)	02/06/25 :02/12/25	M3
Fluorene	ND	ug/kg dry	18		ND		(30)	02/06/25 :02/12/25	
Indeno(1,2,3-cd)pyrene	**38.8**	ug/kg dry	9.1		62.8		47 (30)	02/06/25 :02/12/25	M3
Naphthalene	ND	ug/kg dry	36		ND		(30)	02/06/25 :02/12/25	
Phenanthrene	**101**	ug/kg dry	18		196		63 (30)	02/06/25 :02/12/25	M3
Pyrene	**186**	ug/kg dry	9.1		289		43 (30)	02/06/25 :02/12/25	M3
Surrogate									
2-Methylnaphthalene-d10	*80*	ug/kg dry		*90.6*		88% *(31-129)*		02/06/25 :02/12/25	
Fluoranthene-d10	*87*	ug/kg dry		*90.6*		96% *(63-132)*		02/06/25 :02/12/25	
Matrix Spike (B25B104-MS1)			**Source: W25A228-14**						
Acenaphthene	**163**	ug/kg dry	18	179	ND	91% *(49-122)*		02/06/25 :02/12/25	
Acenaphthylene	**178**	ug/kg dry	18	179	ND	99% *(51-123)*		02/06/25 :02/12/25	
Anthracene	**173**	ug/kg dry	18	179	19.6	86% *(62-115)*		02/06/25 :02/12/25	
Benzo(a)anthracene	**202**	ug/kg dry	8.9	179	96.2	59% *(63-112)*		02/06/25 :02/12/25	M3
Benzo(a)pyrene	**202**	ug/kg dry	8.9	179	83.5	66% *(62-117)*		02/06/25 :02/12/25	
Benzo(b)fluoranthene	**194**	ug/kg dry	8.9	179	129	37% *(53-117)*		02/06/25 :02/12/25	M3
Benzo(g,h,i)perylene	**177**	ug/kg dry	8.9	179	71.5	59% *(42-128)*		02/06/25 :02/12/25	
Benzo(k)fluoranthene	**179**	ug/kg dry	8.9	179	34.1	81% *(53-124)*		02/06/25 :02/12/25	
Chrysene	**206**	ug/kg dry	8.9	179	151	31% *(63-119)*		02/06/25 :02/12/25	M3
Dibenzo(a,h)anthracene	**153**	ug/kg dry	8.9	179	19.6	74% *(44-129)*		02/06/25 :02/12/25	
Fluoranthene	**215**	ug/kg dry	8.9	179	163	29% *(63-115)*		02/06/25 :02/12/25	M3
Fluorene	**166**	ug/kg dry	18	179	ND	93% *(58-113)*		02/06/25 :02/12/25	
Indeno(1,2,3-cd)pyrene	**182**	ug/kg dry	8.9	179	62.8	67% *(46-127)*		02/06/25 :02/12/25	
Naphthalene	**172**	ug/kg dry	36	179	ND	96% *(37-118)*		02/06/25 :02/12/25	
Phenanthrene	**225**	ug/kg dry	18	179	196	17% *(49-119)*		02/06/25 :02/12/25	M3
Pyrene	**261**	ug/kg dry	8.9	179	289	-15% *(63-117)*		02/06/25 :02/12/25	M3
Surrogate									
2-Methylnaphthalene-d10	*89*	ug/kg dry		*89.4*		99% *(31-129)*		02/06/25 :02/12/25	
Fluoranthene-d10	*87*	ug/kg dry		*89.4*		97% *(63-132)*		02/06/25 :02/12/25	

Reported: 02/20/25 05:35

Jennifer Shackelford

Jennifer Shackelford, Laboratory Manager

The results in this report apply only to the samples analyzed. Qualifiers and case narrative comments are essential to interpretation of the analytical results. Report reproductions and/or data summaries without qualifiers and comments are incomplete.

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

Project:	**SW 61st Culvert Replacement**	Client:	Coordinated Site Analysis
Work Order:	**W25B014**	Received:	01/31/25 14:00

Qualifiers

F13	Detected pattern does not resemble the reported fuel product.
F7	This sample underwent silica gel clean-up.
M1	Matrix duplicate precision measurement indicates non-homogeneous sample matrix. Sample result should be considered an estimate.
M3	Inconsistent results for matrix QC (duplicates and/or matrix spikes) indicate non-homogeneous sample matrix. Sample results should be considered estimates.

Definitions

DET	Analyte Detected	ND	Analyte Not Detected at or above the reporting limit
MRL	Method Reporting Limit	MDL	Method Detection Limit
NR	Not Reportable	dry	Sample results reported on a dry weight basis
% Rec.	Percent Recovery	RPD	Relative Percent Difference
*	This analyte is not certified under NELAP		

Reported: 02/20/25 05:35

Jennifer Shackelford

Jennifer Shackelford, Laboratory Manager

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Date: 1/31/25

Water Pollution Control Laboratory
6543 N. Burlington Ave.
Portland, Oregon 97203-4552
Sample Custodian: (503) 823-5696
General Lab: (503) 823-5681

City of Portland Chain-of-Custody

Bureau of Environmental Services

Lab Work Order #: W25B014

Collected By: KAB + JY

Contact Info:

Client Name: **Coordinated Site Analysis**

Project Name: **SW 61st Culvert Replacement**

Project Number (if applicable): **E11640**

CSA Contact Name: **Brian Marcum / Keir Allison-Bourne**

Requested Analyses

Follow-up Tests:
- [x] Run TCLP metals if limit exceeded
- [ ] Run NWTPH-Dx and NWTPH-Gx if detects on NWTPH-HCID
- [x] Run PAHs if detects on NWTPH-Dx
- [x] Run VOCs if detects on NWTPH-Gx

Turn-Around-Time Request:
Need by Date: _____
- [x] Standard (10 business days)
- [ ] Rush (5 business days)
- [ ] Other: _____

Lab Number	Sample Name	Sample Date	Sample Time	Sample Type	Sample Matrix	NWTPH-HCID	NWTPH-Dx	NWTPH-Gx	PCB Aroclors (low-level)	PAHs	Priority Pollutant 13 Metals	RCRA 8 Metals	Total Metals (As, Cd, Cr, Cu, Pb, Hg, Zn)	Total Metals (Cd, Cr, Pb)	VOCs	TOC	HOLD	# of Containers	Remarks
01	B-1-1 (2.5-4)	1/31/25	9:00	C	SL	X						X						3	
02	B-1-2 (7.5-9)	1/31/25	9:10	C	SL	X						X						3	

Relinquished By:	Received By:	Relinquished By:	Received By:
Signature:	Signature:	Signature:	Signature:
Date: 1/31/25	Date: 1/31/25	Date:	Date:
Printed Name: Keir Allison-Bourne	Printed Name: MacKenzie Firl	Printed Name:	Printed Name:
Time: 14:00	Time: 1400	Time:	Time:

CSA Standard WPCL COC

WPCL Cooler Receipt Form

Work Order Number: W25B014 **Cooler Receipt Form Filled Out By:** MZ/MC

Project: CSA – SW 61st Culvert

Received on ice: YES NO (circle one) *[If directly from field, indicate here:____]*

Sample(s) Received From: CBWTP fridge____ Client ✓ Courier____ SR fridge ____

Temperature (°C): 7

	Yes	No	N/A
Is the COC present and signed?	✓		
Are sample bottles intact?	✓		
Do the COC and sample labels match?	✓		
Are the appropriate containers used?	✓		
Are samples appropriately preserved?			✓
Are VOA vials completely filled (zero Headspace)?			✓
Are alkalinity bottles completely filled (zero Headspace)? Note if filled in lab.			✓
Are samples received within holding times (except for pH and residual chlorine)?	✓		

Pres. #	Preservative	LIMS ID	Standard Preservation Amounts
1	HNO_3 (1:1) to pH <2		0.5mL/250mL; 1.0mL/500mL; 4-5 drops/50mL centrifuge tube
2	H_2SO_4 (18N) to pH <2		0.4mL/250mL; 0.8mL/500mL ; 1.6mL/1000mL
3	HCl (1:1) to pH <2		2.0mL/500mL; 4.0mL/1000mL
4	HCl (1:1) to pH 2-3		For TOC: 2-5 drops/250mL
5	NaOH to pH >12		4-10 pellets/500mL; 4 mL 10N/1000mL
	pH test strip (0-2.5 & 0-14)	Lot # HC331173 & HC439975	
	Res Cl test strip	Lot # 3250A 2023/06	
	Lead Acetate test paper	Lot # S60125	

Date	Time	Analyst	Sample LIMS ID	Bottle ID	Pres. #	Comments

Comments:_____