# DATA GAPS INVESTIGATION REPORT

ROSLYN NO. 4 MINE
205 E DAKOTA AVENUE
ROSLYN, WASHINGTON 98941

*Prepared for*
**FORTERRA ROSLYN LLC**
*June 14, 2023*
*Project No. M1122.05.003*

*Prepared by*
*Maul Foster & Alongi, Inc.*
*109 E 13th Street, Vancouver, WA 98660*

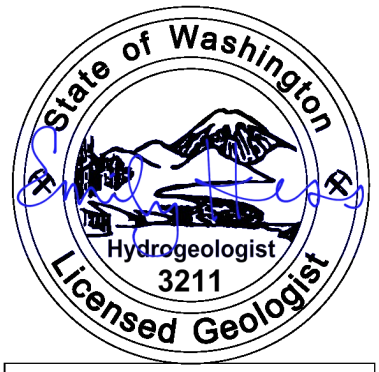
MAUL
FOSTER
ALONGI

# DATA GAPS INVESTIGATION REPORT

ROSLYN NO. 4 MINE
205 E DAKOTA AVENUE
ROSLYN, WASHINGTON 98941

*The material and data in this report were prepared under the supervision and direction of the undersigned.*

MAUL FOSTER & ALONGI, INC.




06-14-2023

*Emily Hess, LHG*
*Project Hydrogeologist*

*Phil Wiescher, PhD*
*Principal Environmental Scientist*

# CONTENTS

TABLES AND ILLUSTRATIONS V

ACRONYMS AND ABBREVIATIONS VI

1 INTRODUCTION 1
1.1 REGULATORY FRAMEWORK 1
1.2 PURPOSE AND OBJECTIVES 1

2 BACKGROUND AND PHYSICAL SETTING 2
2.1 PROPERTY DESCRIPTION 2
2.2 PROPERTY HISTORY 2
2.3 GEOLOGY AND HYDROGEOLOGY 2
2.4 PREVIOUS ENVIRONMENTAL INVESTIGATION 3

3 AREAS OF CONCERN 6

4 CONCEPTUAL SITE MODEL 7
4.1 POTENTIAL RECEPTORS 8
4.2 POTENTIALLY COMPLETE EXPOSURE ROUTES 8
4.3 CRYSTAL CREEK 8

5 FIELD AND ANALYTICAL METHODS 9
5.1 SOIL SAMPLING 10
5.2 GROUNDWATER SAMPLING 11
5.3 INVESTIGATION-DERIVED WASTE 11
5.4 ARCHAEOLOGICAL MONITORING 12

6 ANALYTICAL RESULTS 12
6.1 SOIL 13
6.2 GROUNDWATER 14

7 CONCLUSIONS AND RECOMMENDATIONS 15

LIMITATIONS

REFERENCES

TABLES

FIGURES

APPENDIX A
PHOTOGRAPH LOG

APPENDIX B
GEOLOGIC BORING LOGS

APPENDIX C
FIELD SAMPLING DATA SHEETS

APPENDIX D
ARCHAEOLOGICAL MONITORING REPORT

# CONTENTS (CONTINUED)

APPENDIX E
DATA VALIDATION MEMORANDUM

APPENDIX F
LABORATORY ANALYTICAL REPORTS

# TABLES AND ILLUSTRATIONS

FOLLOWING REPORT:

TABLES

6-1 SUMMARY OF SOIL ANALYTICAL RESULTS

6-2 SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

FIGURES

1-1 PROPERTY LOCATION

2-1 PROPERTY FEATURES OF INTEREST

2-2 PREVIOUS SOIL SAMPLE LOCATIONS AND MTCA EXCEEDANCES

2-3 PREVIOUS GROUNDWATER SAMPLE LOCATIONS AND MTCA EXCEEDANCES

4-1 PRELIMINARY CONCEPTUAL SITE MODEL

5-1 SOIL SAMPLE LOCATIONS AND MTCA EXCEEDANCES FOR WESTERN PORTION OF PROPERTY

5-2 SOIL SAMPLE LOCATIONS AND MTCA EXCEEDANCES FOR CENTRAL PORTION OF PROPERTY

5-3 GROUNDWATER SAMPLE LOCATIONS AND MTCA EXCEEDANCES

5-4 SOIL SAMPLE LOCATIONS AND MTCA EXCEEDANCES

# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| bgs | below ground surface |
| COPC | chemical of potential concern |
| CSM | conceptual site model |
| CUL | cleanup level |
| Ecology | Washington State Department of Ecology |
| EPA | U.S. Environmental Protection Agency |
| ESA | environmental site assessment |
| FBI | Friedman & Bruya, Inc. |
| FCB | fecal coliform bacteria |
| Forterra | Forterra Roslyn LLC |
| HC | Hart Crowser, Inc. |
| ICE | Icicle Creek Engineers, Inc. |
| MFA | Maul Foster & Alongi, Inc. |
| mg/kg | milligrams per kilogram |
| MTCA | Model Toxics Control Act |
| NTU | nephelometric turbidity units |
| PAH | polycyclic aromatic hydrocarbon |
| PCB | polychlorinated biphenyl |
| the Property | Roslyn No. 4 Mine |
| TCLP | toxicity characteristic leaching procedure |
| TMDL | Total Maximum Daily Load |
| TPH | total petroleum hydrocarbons |
| ug/L | micrograms per liter |
| WAC | Washington Administrative Code |

# 1 INTRODUCTION

Maul Foster & Alongi, Inc. (MFA), has prepared this data gaps investigation report for Forterra Roslyn LLC (Forterra) to characterize potential environmental impacts at the Roslyn No. 4 Mine (the Property; see Figure 1-1), located at 205 E Dakota Avenue in Roslyn, Washington. Forterra is the owner of the Property.

The Property is currently vacant but was formerly used for a variety of operations, including a coal mine; a foundry that remained active through the mid-1970s; a powerhouse with large transformers; and a small building foundation that was reportedly used as a pad by the townspeople of Roslyn to change oil and conduct vehicle maintenance. The coal mine (referred to as the No. 4 Mine), was active from the 1880s until about 1909, when it was shut down following an explosion.

A draft data gaps investigation report was provided to Ecology for their review (MFA 2023b); this data gaps investigation report incorporates comments received from Ecology (Ecology 2023).

## 1.1 Regulatory Framework

This report has been prepared in accordance with grant agreement No. OTGP-2023-FortNW-00018, with an effective date of December 15, 2022, between the Washington State Department of Ecology (Ecology) and Forterra. The grant supports Forterra's environmental site assessment, analysis of cleanup alternatives, and site planning for redevelopment to transform the Property for attainable housing and community benefit.

Investigation activities were conducted in general accordance with guidance put forth in the Model Toxics Control Act (MTCA) (Washington Administrative Code [WAC] 173-340) and with MFA's Ecology-approved data gaps investigation work plan (2023a).

The Property is listed in Ecology's cleanup site database as cleanup site ID 15545 and facility site ID 66921.

## 1.2 Purpose and Objectives

The purpose of the investigation was to characterize environmental conditions and generate data sufficient for evaluating the nature and extent of impacts and developing potential cleanup actions. The investigation scope of work was developed to achieve the following specific project objectives:

- Develop a preliminary conceptual site model (CSM) for the Property.
- Investigate hazardous substances in environmental media to identify nature and extent of contamination above MTCA cleanup levels (CULs).

- Evaluate the potential risks to current and reasonably likely future human and ecological receptors.
- Generate sufficient data to evaluate the potential cleanup options for impacted environmental media on the Property.

# 2 BACKGROUND AND PHYSICAL SETTING

The Property background and physical setting information summarized below has been obtained from site visits, an environmental file review, and previous property investigations.

## 2.1 Property Description

The Property consists of one 30.4-acre parcel (Kittitas County parcel 456234) and is currently vacant and undeveloped (see Figures 1-1 and 2-1). Remnant foundations of former structures, including a foundation used for auto maintenance, former pump house, and an unidentified brick structure were observed during the site reconnaissance in 2020.

The Property is generally flat with a slight increase in slope to the north. A former tailings pile on the southeast portion of the Property is the topographic high.

## 2.2 Property History

An underground coal mine, the No. 4 Mine, was active at the Property from the 1880s until about 1909 when the mine was shut down following a mine explosion. The No. 4 Mine shaft was backfilled at this time and was again backfilled approximately 50 years later after settlement in the mine shaft presented a safety hazard. Historic structures on the Property included a powerhouse, wash house, two barns, two warehouses, a foundry, the tipple and entrance shaft for the No. 4 Mine, the tipple for the No. 6 and No. 8 Mines, and several small buildings. The powerhouse and foundry were fueled by coal and coke. Large electrical transformers were formerly located northeast of the powerhouse between the 1960s and 1980s, until a new power substation was constructed off-property in the town of Roslyn. Although the mine was no longer active after the 1909 explosion, the foundry remained operational through the mid-1970s to service the remaining mines in Roslyn that operated through the mid-1960s. All remaining structures on the Property were removed in the 1980s.

## 2.3 Geology and Hydrogeology

Based on surrounding area topography and local discharge points, the direction of groundwater flow is generally to the south, toward Crystal Creek. A tributary of Crystal Creek is present on the western and southwestern portions of the Property.

According to the 2000 U.S. Geological Survey Geologic Map of the Snoqualmie Pass Quadrangle, Washington, the Property is predominantly underlain by unconsolidated deposits consisting of dense,

glacially overridden material of alternating till (very dense sand and gravel), outwash (dense sand and gravel), and lacustrine (hard silt and sand) deposits.

During Phase II environmental site assessment (ESA) activities conducted at the Property in 2007, soil types encountered were predominantly fill consisting of silty sands with sparse gravel and coal fragments associated with historical mining activities (HC 2007). Groundwater was encountered at depths ranging from 4.59 to 11.9 feet below ground surface (bgs). During the data gaps investigation in April 2023, soil types encountered were predominantly silty sands and sandy silts to the maximum depth explored, 19.5 feet bgs. Groundwater was encountered in temporary wells at depths ranging from 2.70 to 3.40 feet bgs.

## 2.4 Previous Environmental Investigation

Several environmental assessments have been completed at the Property by different parties. These include the following:

- Multiple Phase I and Phase II ESAs completed between 2004 and 2007 by Hart Crowser, Inc. (HC) (HC 2004, 2006, 2007).
- Follow-up investigation in 2020 by Icicle Creek Engineers, Inc. (ICE) (ICE 2020).
- Phase I ESA completed in 2020 by MFA (MFA 2020).

A memorandum prepared by MFA (2022) provided an overview of the Property's history and environmental conditions based on prior assessment activities. These documents are briefly summarized below. Prior soil sample locations are shown on Figure 2-2 and prior groundwater sample locations are shown on Figure 2-3.

### 2004 HC Environmental Assessment

In 2004, HC completed a Phase I ESA and limited Phase II ESA that included soil sampling and analysis (HC 2004). HC evaluated historical uses of the Property and identified four areas of potential concern:

- Former foundry area and associated slag pile
- Building foundation area used for vehicle maintenance
- Power transformers
- Mine tailings pile and surface mine rock fill on the Property

Phase II ESA sampling included the following:

- Nine hand auger borings (HB-1 through HB-9) up to 1 foot bgs
- Grab sampling of the slag and tailings piles

Soil samples from HB-1, -3, -5, -6, and -8 were submitted for laboratory analysis for one or more of the following:

- Diesel- and heavy-oil-range total petroleum hydrocarbons (TPH)
- Polycyclic aromatic hydrocarbons (PAHs)
- Polychlorinated biphenyls (PCBs)
- Total metals (lead, chromium, cadmium, copper, nickel, arsenic, zinc, and mercury)

TPH, PAHs, PCBs, and mercury were not detected in soil. Concentrations of lead, nickel, chromium, copper, and zinc were below applicable MTCA Method A or Method B CULs in four soil samples and a slag sample. One soil sample (HB-1), collected near the bottom of the foundation used for vehicle maintenance, had a concentration of cadmium (2.7 milligrams per kilogram [mg/kg]) that slightly exceeded the MTCA Method A CUL (2 mg/kg). Soil sample HB-3, collected near the former foundry, had a concentration of lead (620 mg/kg) that exceeded the MTCA Method A CUL (250 mg/kg).

## Summary of 2006 HC Environmental Assessment

Additional environmental assessment conducted by HC in 2006 included completion of 14 test pits (TP-1 through TP-14) up to 10 feet bgs to assess the following:

- Former foundry area and associated slag pile
- Building foundation area used for vehicle maintenance
- Former area of the powerhouse and transformers
- Mine tailings pile (no samples submitted for chemical analysis)

Samples were analyzed for one or more of the following:

- Gasoline-range TPH
- Diesel- and heavy-oil-range TPH
- PAHs and PCBs
- Volatile organic compounds
- Total metals

Results of laboratory testing included the following:

- Gasoline-range TPH, diesel-range TPH, PCBs, and volatile organic compounds were not detected in any of the soil samples submitted for these analyses.
- Heavy oil-range TPH was detected at 2,100 mg/kg (MTCA Method A CUL 2,000 mg/kg) in a sample from near the former powerhouse.
- PAHs were detected in one soil sample from the transformer area at concentrations below their respective MTCA CULs.
- MTCA Method A CULs for arsenic, cadmium, mercury, and lead were exceeded in five soil samples.

## Summary of 2007 HC Environmental Assessment

HC performed additional assessment in 2007 to evaluate the following:

- Former foundry area and associated slag pile
- Building foundation area used for vehicle maintenance
- Former area of transformers and the powerhouse
- Wetland area

Specifically, HC did the following:

- Collected near-surface soil samples HC-SS-1 through HC-SS-15 from 0.5 feet bgs
- Collected soil samples from four push probes (HC-SB-5 through HC-SB-8) to 8 feet bgs
- Collected soil samples at HC-WS-1 through HC-WS-3 from the wetland area
- Completed four miniwells (HC-MW-1 through HC-MW-4) and collected samples of seasonally perched groundwater

Selected soil, sediment, and groundwater samples were analyzed for one or more of the following:

- Diesel- and heavy-oil-range TPH
- Total metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc)

Concentrations of TPH were below MTCA CULs. MTCA CUL exceedances for metals in soil samples included cadmium, arsenic, and mercury.

The depth of groundwater encountered at the miniwells in August 2007 varied between 4.59 and 11.9 feet bgs. The groundwater samples collected from miniwells were analyzed for total metals. Following development and purging, a sample was collected from each well and analyzed for total metals. There reportedly was insufficient groundwater in the wells to collect a field-filtered sample for dissolved metal analysis. According to HC, this perched groundwater is only observed seasonally. This shallow perched water is not a potential source of drinking water and likely dries up in the summer months.

Three of the perched groundwater samples had concentrations of total metals, specifically lead, chromium, or arsenic, that exceeded MTCA Method A CULs. Field notes from HC indicate the turbidity of these samples was elevated (350 to 400 nephelometric turbidity units [NTUs]) and sediment in the samples likely contributed to the CUL exceedances for metals.

## Summary of 2020 ICE Investigation

In 2020, ICE conducted additional soil sampling in the vicinity of the mine tailings pile (TP-96 through TP-103) and slag pile (TP-104, TP-105, and TP-106). ICE also reviewed the HC ESAs conducted in 2004, 2006, and 2007 and found no significant changes in surface site conditions had occurred since that time. In summary:

- Concentrations of diesel- and heavy-oil-range TPHs and metals in the vicinity of the mine tailings pile were below their respective MTCA Method A CULs.
- Concentrations of cadmium and arsenic in the vicinity of the slag pile were above their respective MTCA Method A CULs, while lead, chromium, copper, nickel, mercury, and zinc concentrations were below their respective MTCA Method A CULs.

### Summary of 2020 MFA Phase I ESA

In 2020, MFA conducted a Phase I ESA. MFA's findings were consistent with previous investigations summarized above.

# 3 AREAS OF CONCERN

This section discusses known and suspected areas of contamination at the Property, based on identified features of interest associated with historical operations, areas of contamination identified during previous sampling activities, and the nature and extent of chemicals of potential concern (COPCs).

Features of interest have been identified based on activities, conveyances, and physical features associated with former operations that may have resulted in a release of hazardous substances to environmental media at the Property (see Figure 2-1). See Figure 2-2 for soil conditions and Figure 2-3 for groundwater conditions.

**Vehicle maintenance area.** Soil samples (HB-1, TP-8, HC-SS-14, and HC-SS-15) collected near the building foundation where vehicle maintenance activities were conducted had concentrations of cadmium, arsenic, and mercury exceeding their respective MTCA Method A CULs. Petroleum hydrocarbons were not detected in the soil samples.

**Former foundry.** Concentrations of arsenic and lead in soil samples (HB-3, HC-SS-12) in the vicinity of the former foundry exceeded their respective MTCA Method A CULs.

**Slag pile.** Concentrations of arsenic, lead, mercury, and cadmium in soil samples (TP-1, TP-2, TP-104, and TP-105) in the vicinity of the slag pile area exceeded their respective MTCA Method A CULs.

**Wetland area.** The concentration of arsenic in a soil sample (HC-WS-2) collected in the vicinity of the wetland area exceeded the MTCA Method A CUL.

**Former powerhouse.** Soil samples (TP-13, HC-SS-1, and HC-SS-3) collected in the vicinity of the former powerhouse had concentrations of oil-range TPH, arsenic, and mercury that exceeded their respective MTCA Method A CULs.

**Former transformers.** Soil samples (TP-12, HC-SS-5) collected in the vicinity of the former power transformers had concentrations of mercury exceeding the MTCA Method A CUL.

**Perched groundwater.** The depth of groundwater encountered at the miniwells in August 2007 varied between 4.59 and 11.9 feet bgs. Groundwater samples were collected from miniwells that went dry during development and purging. Turbid groundwater samples were analyzed for total metals and three of the samples had concentrations of lead, chromium, and arsenic that exceeded their respective MTCA Method A CULs. There is no indication that these wells installed in 2007 have been decommissioned; however, they were not observed during site activities conducted in 2020 by ICE or MFA.

# 4 CONCEPTUAL SITE MODEL

A preliminary CSM was developed to describe release mechanisms, environmental transport processes, exposure routes, and receptors for sources of contamination identified on the Property (see Figure 4-1). The primary purpose of a CSM is to identify potential pathways by which human and ecological receptors could be exposed to site-related chemicals. A complete exposure pathway consists of four necessary elements: (1) a source and mechanism of chemical release to the environment; (2) an environmental transport medium for a released chemical; (3) a point of potential contact with the impacted medium (referred to as the exposure point); and (4) an exposure route (e.g., soil ingestion) at the exposure point. The preliminary CSM is based on information collected during previous investigations (HC 2004, 2006, 2007; ICE 2020), and MFA's understanding of the proposed future use of the Property (MFA 2020, 2022).

The primary mechanisms likely to influence the fate and transport of chemicals on the Property include natural biodegradation of organic chemicals, sorption of chemicals to soil, physical dispersion of adsorbed chemicals, leaching of chemicals from soil to groundwater, and volatilization from soil and groundwater to air. The relative importance of these processes varies, depending on the chemical and physical properties of the released contaminant. The properties of the soil and the dynamics and elevation of groundwater also affect contaminant fate and transport.

The Property is primarily undeveloped land with gravel access roads and vegetation. The soil-to-groundwater migration pathway is potentially complete because of the potential for precipitation and infiltration through unpaved areas on the Property into contaminated vadose-zone soil, followed by potential leaching of contaminants into shallow groundwater.

Volatile contaminants in soil have the potential to partition to the vapor phase, which could result in impacts to air quality. However, the proposed development plans in the vicinity of the only soil location in which volatile contaminants were identified above MTCA Method A CULs does not include building construction, and the indoor air pathway is therefore incomplete. Volatilization to outdoor air is considered insignificant.

The topography of the Property is relatively level in the northern portion and hilly in the central eastern and southeastern portions of the Property where it slopes downward to the south/southeast. Based on surrounding area topography and local discharge points, the direction of groundwater flow is generally to the south, toward Crystal Creek. A tributary of Crystal Creek is present on the western

and southwestern portions of the Property (see Figures 1-1 and 2-1). Because Crystal Creek and the wetland area are only a few feet deep and the depth to groundwater on the Property ranges from approximately 2.5 feet bgs to greater than 11 feet bgs, the groundwater to surface water pathway is considered insignificant.

Potable water provided by the City of Roslyn is available for use in the vicinity of the Property and groundwater beneath the Property is not currently used as a drinking water source. However, unless it can be demonstrated that groundwater is not a future potential source of drinking water based on the criteria set forth in WAC 173-340-720(2), groundwater is classified as potable to protect drinking water beneficial uses. Therefore, the groundwater direct contact pathway is considered potentially complete for future conditions.

## 4.1 Potential Receptors

Redevelopment plans for the Property include preserving approximately 17 acres for community benefit and natural space and developing approximately 13.4 acres with attainable housing (see Figure 2-2). Therefore, construction workers, occupational workers, visitors, and residents (e.g., human receptors) are considered current and future potential receptors. In addition, ecological receptors are considered current and future potential receptors due to the large percentage of the Property that will remain undeveloped.

## 4.2 Potentially Complete Exposure Routes

Based on the current or future potentially complete exposure scenarios and potential human and ecological receptors to contaminated media described above, there are three potentially complete exposure routes, as shown in Figure 4-1:

- Humans may come into contact with soil via ingestion, dermal contact, or inhalation.
- Ecological receptors may come into contact with soil via ingestion, dermal contact, or inhalation.
- Humans may come into contact with groundwater via ingestion, dermal contact, or inhalation.

## 4.3 Crystal Creek

Crystal Creek originates in the hills above the City of Roslyn, runs along the historic Coal Mine Trail, through the city of Cle Elum, and then joins the Yakima River (Ecology 2018). It drains over eight square miles of forested foothills in its four-mile course. Crystal Creek averages two to six feet wide, with an average depth of 0.5 foot. It often dries up in several sections in late summer through early fall.

Crystal Creek is listed on the 303(d) list of impaired waters and a Total Maximum Daily Load (TMDL) has been developed. The goal of a TMDL is to ensure the impaired water will attain water quality standards. Crystal Creek has a Category 4a designation for having an EPA-approved TMDL being

implemented for fecal coliform bacteria (FCB). FCB in water indicates the presence of waste from humans and other warm-blooded animals. Crystal Creek surface water sampling conducted in 2009 and 2010 indicates FCB levels generally met criteria, except for a slight exceedance at the most downstream sampling site, which is also the site furthest from the Property. Ecology's recommendations to address the FCB TMDL include:

- Conduct additional sampling for FCB in Crystal Creek, including all tributaries, from within the City of Roslyn to the creek's confluence with the Yakima River. Use results from this sampling to determine where additional FCB reduction activities should occur.
- Work with Kittitas County Environmental Health Department to identify potential leaking on-site septic systems. Work with property owners to correct problems, by providing financial and technical assistance.
- Identify properties near Crystal Creek that graze or house livestock. Work with property owners to prevent livestock pollution to Crystal Creek.

The Property has no known sources contributing FCB to Crystal Creek. Wastewater discharges from the Property as part of the planned development will be connected to the City of Roslyn sewer system and this and redevelopment activities therefore will not contribute adversely to FCB in Crystal Creek.

# 5 FIELD AND ANALYTICAL METHODS

The data gaps investigation was conducted in general accordance with the methods and protocols described in the Ecology-approved work plan (MFA 2023a). Standard field operating procedures for collecting soil samples, scheduling analyses, decontaminating equipment, and managing waste are described in the sampling and analysis plan, included as an appendix to the work plan (MFA 2023a). Representative photographs from the data gaps investigation are provided in Appendix A.

MFA requested a public utility locate before advancing exploratory borings. In addition, Applied Professional Services, Inc., of North Bend, Washington, conducted a private utility locate on the Property on April 10, 2023, to identify the presence of underground utilities near the proposed boring locations. Boring locations were adjusted in the field based on the presence of subsurface utilities or access limitations from dense vegetation.

The data gaps investigation was conducted between April 11 and 13, 2023. MFA subcontracted Anderson Environmental Contracting, LLC, of Kelso, Washington, a driller licensed in the state of Washington, to advance the borings using push-probe methods. RLR Cultural Resources, LLC, conducted cultural resources monitoring of each boring, in accordance with the inadvertent discovery plan.

The borings were located adjacent to the following features of interest (see Figures 5-1 through 5-4):

- **Foundation for vehicle maintenance:** VM-DP-1 through VM-DP-4

- **Former foundry:** FO-DP-1 through FO-DP-4
- **Slag pile:** SP-DP-1 through SP-DP-3
- **Former powerhouse:** PH-DP-1 through PH-DP-5
- **Former transformers:** TF-DP-1 and TF-DP-2
- **Wetlands:** WL-DP-1 through WL-DP-4

The elements of the investigation are described in the following sections.

## 5.1 Soil Sampling

Using push-probe technology, 22 borings were advanced across the Property. Of these borings, three were completed as reconnaissance wells and groundwater samples were collected. Continuous soil cores were collected from the ground surface down to a maximum depth of 19.5 feet bgs. Soil from the borings was observed in 5-foot core intervals to the maximum depths drilled. Soil characteristics and visual or olfactory observations were recorded on soil boring logs (included as Appendix B). Soil headspace was periodically screened for organic vapors, using a photoionization detector. There was no visual or olfactory evidence of contamination, and organic vapors were not present.

The subsurface soils at the Property generally consist of sandy silt and silty sand, with varying amounts of gravel. Borings FO-DP-3, PH-DP-3, PH-DP-4, SP-DP-3, TA-DP-1, TF-DP-2, and VM-DP-1 also encountered various amounts of coal down to approximately 3 feet bgs. Figure 5-1 and 5-2 include information on where coal was noted to be present at the sampling locations. Coal is known to be present throughout the region due to historic mining operations. Soil cores were observed to become wet between approximately 0.4 and 10 feet bgs. Groundwater was encountered in temporary wells at depths ranging from 2.70 to 3.40 feet bgs.

Discrete soil samples were generally collected from the following target depths (depending on field conditions and the maximum depths drilled for each boring): 0 to 1 foot bgs, 2 to 3 feet bgs, 4 to 5 feet bgs, 8 to 9 feet bgs, and 14 to 15 feet bgs.

MFA used a tiered approach to analyze soil at the laboratory. As there were no field indications of contamination (i.e., visual, olfactory, or elevated photoionization detector readings), the uppermost sample collected in each boring was initially submitted for analysis and the remaining samples collected were placed on hold. If the submitted sample from a boring indicated an elevated result for COPCs, additional archived soil samples were selected for analysis to delineate the vertical extent of contamination.

The soil samples were submitted under chain-of-custody procedures to Friedman & Bruya, Inc. (FBI), of Seattle, Washington, and analyzed for one or more of the following COPCs:

- Diesel- and motor-oil-range hydrocarbons by Northwest TPH Dx Method
- Hexavalent chromium by U.S. Environmental Protection Agency (EPA) Method 7196
- Total metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc) by EPA Method 6020B

- Dissolved metals (arsenic, chromium, and lead) by EPA Method 6020B
- Lead by EPA method 6020B with toxicity characteristic leaching procedure (TCLP) method

## 5.2 Groundwater Sampling

Reconnaissance groundwater samples were collected from borings PH-DP-4, SP-DP-2, and TA-DP-1 to evaluate the potential for COPCs. The depth to groundwater in the reconnaissance wells was measured using a water level indicator, and ranged from approximately 2.70 to 3.40 feet bgs. Groundwater samples were collected from each boring using a dedicated 0.75-inch polyvinyl chloride temporary well casing with a 10-foot polyvinyl chloride machine-slotted screen with a stainless steel prepacked sand screen. Groundwater samples were collected from approximately the midpoint of the saturated screened interval and submitted for laboratory analysis. Field sampling data sheets for groundwater are provided in Appendix C.

Groundwater samples were collected using a peristaltic pump and dedicated, disposable tubing. Samples collected for dissolved constituents were field-filtered using a 0.45-micron filter during sample collection. A water quality meter and turbidity meter were used at all three locations to record water quality parameters. A groundwater sample was collected when monitoring parameters had generally stabilized (i.e., pH within 0.1 standard units, temperature within 0.1 degree Celsius, specific conductance within 10 percent, and turbidity below 5 NTUs or within 10 percent if 5 NTUs cannot be obtained) for at least three consecutive readings. Significant sediment was observed to settle in sample bottles collected from boring SP-DP-2, including the bottle containing groundwater filtered in the field using a 0.45-micron filter. Therefore, in addition to the field-filtered fractions, MFA also submitted unpreserved and unfiltered fractions of samples collected from boring SP-DP-2, which were filtered and preserved at the laboratory upon sample receipt. At MFA's request, FBI reported both the field- and laboratory-filtered EPA Method 6020B dissolved metals results for these samples.

The groundwater samples were submitted under chain-of-custody procedures to FBI of Seattle, Washington, and analyzed for one or more of the following laboratory analyses:

- Total metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc) by EPA Method 6020B
- Dissolved metals (arsenic, chromium, and lead) by EPA Method 6020B

## 5.3 Investigation-Derived Waste

Investigation-derived waste included one 55-gallon drum (approximately one-quarter full) of soil cuttings and one 55-gallon drum (approximately three-quarters full) of groundwater and decontamination fluids. Investigation-derived waste is stored in secured, Washington State Department of Transportation-approved drums on the southeast portion of the Property and will be disposed of off-Property at an appropriately permitted facility.

## 5.4 Archaeological Monitoring

During ground-disturbing activities, an archaeologist with RLR Cultural Resources, LLC, conducted cultural resources monitoring. Archaeological monitoring was required due to the Property's location within a known, potentially National Register of Historic Places eligible archaeology site 45KT2784 (i.e., the No. 4 Mine). As requested by Ecology, archaeological monitoring was conducted to observe and document cultural resources that may have been exposed during all ground-disturbing activities. The monitoring report prepared by RLR Cultural Resources, LLC, is included in Appendix D.

In summary, limited cultural material (e.g., ceramic, metal, and brick) were identified during drilling. Because of this, RLR Cultural Resources, LLC, recommended additional survey and testing in the areas of proposed disturbance to update the record for archaeological site 45KT2784 prior to the Property redevelopment.

# 6 ANALYTICAL RESULTS

Soil and groundwater analytical results were compared to MTCA Method A CULs for unrestricted land use. Where MTCA Method A CULs were not available for specific analytes, the results were screened against the lower of MTCA Method B CULs for noncancer and cancer values. Analytical results are included in Tables 6-1 (soil) and 6-2 (groundwater). Values for Yakima Basin, Washington, natural background metals concentrations in soil (Ecology 1994) are also provided in Table 6-1 for reference. Figures 5-1 and 5-2 show locations in which MTCA CUL exceedances in soil were observed on the western and central portion of the Property, respectively. Figure 5-3 shows the locations of MTCA CUL exceedances in groundwater. Figure 5-4 shows the locations of MTCA CUL exceedances in soil for both current and historical samples collected on the Property. The data validation memorandum is included in Appendix E. Analytical reports are included in Appendix F.

Soil samples collected were screened against the EPA toxicity characteristic rule of 20 to determine if the material is nonhazardous. If a waste is 100 percent solid, as defined by the TCLP method, then the results of the total constituent analysis may be divided by 20 to convert the total results into the maximum leachable concentration. This factor is derived from the 20:1 liquid-to-solid ratio employed in the TCLP.

Consistent with Ecology Implementation Memorandum No. 4, the diesel- and motor-oil-range TPH results were summed for comparison to the heavy oils screening criteria. Heavy oils were calculated as follows (Ecology 2004):

- Diesel- and motor-oil-range hydrocarbon results qualified as non-detect and flagged with a U are used in the total calculation at one-half the associated value. When both results were non-detect, the highest detection limit was used.
- Diesel- and motor-oil-range hydrocarbon results qualified as estimated and flagged with a J were used in the total calculation without modification.

Per WAC 173-340-840(5) and Ecology *Toxics Cleanup Program Policy 840: Data Submittal Requirements* (Ecology 2005), data generated shall be submitted simultaneously in both written and electronic formats. The data presented in this report were loaded into Ecology's Environmental Information Management System on May 15, 2023.

The following subsections summarize analytical results for soil and groundwater.

## 6.1 Soil

Soil samples submitted for laboratory analysis were analyzed to determine whether metals are present in soils. In addition, soil samples collected in the vicinity of the former powerhouse were submitted for analysis of diesel- and motor-oil-range hydrocarbons to determine whether legacy petroleum products are present in soils. Figures 5-1 and 5-2 show locations in which MTCA CUL exceedances in soil were observed on the western and central portion of the Property, respectively. A summary of soil samples that exceeded applicable CULs is provided below for each feature of interest.

**Former foundry.** Total cadmium and lead were detected in the soil sample collected at 0.5 feet bgs at location FO-DP-3 at concentrations of 5.45 mg/kg and 988 mg/kg, respectively. These concentrations exceed their respective MTCA Method A CULs of 2 mg/kg (cadmium) and 250 mg/kg (lead). The deeper sample collected from FO-DP-3 at 2.5 feet bgs was analyzed for total cadmium and lead. Concentrations were either not detected or below applicable MTCA CULs and background levels.

The total lead detection in sample FO-DP-3 at 0.5 feet bgs (988 mg/kg) exceeds the TCLP rule of 20 concentration (100 mg/kg). This sample was analyzed for lead by the TCLP method to assess whether the material should be classified as hazardous waste. Lead was not detected in the TCLP extract. Therefore, FO-DP-3 at 0.5 feet bgs is classified as nonhazardous material.

**Former powerhouse.** Total arsenic was detected in the soil sample collected at 0.5 feet bgs at location PH-DP-4 at a concentration of 46.5 mg/kg, which exceeds the MTCA Method A CUL of 20 mg/kg. The deeper sample collected from PH-DP-4 at 2.5 feet bgs was analyzed for total arsenic. The concentration of 7.6 mg/kg is below the MTCA Method A CUL. Mercury was not detected in the soil samples analyzed.

**Slag pile.** Total cadmium was detected in the primary and duplicate soil samples collected at 0.5 feet bgs at location SP-DP-3 at a concentration of 2.66 mg/kg and 2.32 mg/kg, respectively. These concentrations exceed the MTCA Method A CUL of 2 mg/kg. Total cadmium was not detected in the deeper sample collected from SP-DP-3 at 2.5 feet bgs.

**Former transformers.** Total arsenic and cadmium were detected in the soil sample collected at 1.0 foot bgs at location TF-DP-1 at concentrations of 38.1 mg/kg and 3.54 mg/kg, respectively. These concentrations exceed their respective MTCA Method A CULs of 20 mg/kg (arsenic) and 2 mg/kg (cadmium). Total arsenic and cadmium were not detected in the deeper sample collected from TF-DP-1 at 3.0 feet bgs. Total arsenic was detected in the soil sample collected at 0.5 feet bgs at location TF-DP-2 at a concentration of 24.7 mg/kg, which exceeds the MTCA Method A CUL of 20 mg/kg.

The deeper sample collected from TF-DP-2 at 2.5 feet bgs was analyzed for total arsenic. The concentration of 6.16 mg/kg is below the MTCA Method A CUL.

**Vehicle maintenance area.** Total arsenic, cadmium, and lead were detected in the soil sample collected at 0.5 feet bgs at location VM-DP-3 at concentrations of 25.9 mg/kg, 5.33 mg/kg, and 301 mg/kg, respectively. These concentrations exceed their respective MTCA Method A CULs of 20 mg/kg (arsenic), 2 mg/kg (cadmium), and 250 mg/kg (lead). Total arsenic, cadmium, and lead were either not detected or detected below MTCA Method A CULs and background levels the in the deeper sample collected from VM-DP-3 at 2.5 feet bgs.

The total lead detection in sample VM-DP-3 at 0.5 feet bgs (301 mg/kg) exceeds the TCLP rule of 20 concentration (100 mg/kg). This sample was analyzed for lead by the TCLP method to assess whether the material should be classified as hazardous waste. Lead was not detected in the TCLP extract. Therefore, VM-DP-3 at 0.5 feet bgs is classified as nonhazardous material.

There were no MTCA CUL exceedances in the remaining borings, nor in borings advanced in the vicinity of the wetlands (see Table 5-1).

## 6.2 Groundwater

Groundwater samples were collected from borings PH-DP-4, SP-DP-2, and TA-DP-1 in the vicinity of the former powerhouse, slag pile, and tailings pile, respectively, to determine whether metals are present in groundwater. Figure 5-3 shows locations in which MTCA CUL exceedances in groundwater were observed.

Only the primary and duplicate samples collected from boring SP-DP-2 exceeded MTCA CULs as follows:

**Arsenic.** Total arsenic was detected in samples SP-DP-2 and SP-DP-2-DUP at concentrations of 35.7 micrograms per liter (ug/L) and 35.1 ug/L, respectively, above the MTCA Method A CUL of 5 ug/L. Dissolved arsenic was detected in samples SP-DP-2 and SP-DP-2-DUP at concentrations of 34.2 ug/L and 39.7 ug/L, respectively, in the field-filtered samples, and at concentrations of 21.5 ug/L and 20.8 ug/L, respectively, in the laboratory-filtered samples, above the MTCA CUL of 5 ug/L.

**Chromium.** Total chromium was detected in samples SP-DP-2 and SP-DP-2-DUP at concentrations of 159 ug/L and 166 ug/L, respectively, above the MTCA Method A CUL of 50 ug/L. Dissolved chromium was either not detected or detected below the MTCA Method A CUL in the field- and laboratory-filtered samples.

**Lead.** Total lead was detected in samples SP-DP-2 and SP-DP-2-DUP at concentrations of 58.1 ug/L and 60.9 ug/L, respectively, above the MTCA Method A CUL of 15 ug/L. Dissolved lead was either not detected or detected below the MTCA Method A CUL in the field- and laboratory-filtered samples.

All other COPCs were detected at concentrations below method reporting limits or below applicable MTCA CULs.

As the groundwater samples were collected from reconnaissance borings, sediment in the groundwater samples likely contributed to the MTCA CUL exceedances in boring SP-DP-2 for total and dissolved arsenic, total chromium, and total lead. Groundwater was noted to be very turbid and, despite purging the reconnaissance well for approximately five hours the first day and allowing the well to settle overnight, the turbidity meter indicated the final turbidity was approximately 729 NTUs. As shown in the photographs in Appendix A, sediment visibly settled in the sample bottles, including the dissolved metal samples that were field-filtered with a 0.45-micron inline filter. Corresponding soil samples collected from this boring did not have elevated metals concentrations. In addition, the concentration of arsenic in the soil sample collected at boring PH-DP-4 in the vicinity of the former powerhouse was approximately ten times greater than the concentration in the soil sample collected from boring SP-DP-2, however, the groundwater sample from PH-DP-4 did not contain elevated concentrations of arsenic. Therefore, the elevated metals concentrations in the reconnaissance groundwater samples collected from boring SP-DP-2 at the slag pile are not anticipated to be representative of groundwater conditions at the Property.

# 7 CONCLUSIONS AND RECOMMENDATIONS

The purpose of this investigation was to:

- Develop a preliminary CSM for the Property.
- Investigate hazardous substances in environmental media to identify nature and extent of contamination above MTCA CULs.
- Evaluate the potential risks to current and reasonably likely future human and ecological receptors.
- Generate sufficient data to evaluate the potential cleanup options for impacted environmental media on the Property.

The analytical results for the data gaps investigation and previous environmental investigations completed for the Property support the following conclusions (see Figure 5-4):

**Vehicle maintenance area.** The northern and southern extent of metals impacts to shallow soil has been delineated. Due to dense vegetation, samples could not be collected west of the vehicle maintenance area. The sample collected at 0.5 feet bgs at location VM-DP-3 exceeded the respective MTCA Method A CULs for arsenic, cadmium, and lead. The deeper sample collected at this location did not exceed applicable CULs. Therefore, the vertical extent of contamination has been delineated. The lateral extent of arsenic, cadmium, and lead has not been delineated to the east of the vehicle maintenance area.

**Former foundry.** The northern, western, and southern extent of arsenic and lead impacts to shallow soil has been delineated. The sample collected at 0.5 feet bgs at location FO-DP-3 exceeded the respective MTCA Method A CULs for cadmium and lead. The deeper sample collected at this location

did not exceed applicable CULs. Therefore, the vertical extent of contamination has been delineated. The lateral extent of cadmium and lead contamination has not been delineated to the east of the former foundry.

**Slag pile.** The extent of arsenic, lead, and mercury impacts to shallow soil has been delineated. The sample collected at 0.5 feet bgs at location SP-DP-3 exceeded the MTCA Method A CUL for cadmium. The deeper sample collected at this location did not exceed the CUL. Therefore, the vertical extent of contamination has been delineated. The lateral extent of cadmium contamination in soil has not been delineated to the southwest of the slag pile. In addition, MTCA Method A CUL exceedances for total and dissolved arsenic and total chromium and lead were observed in the groundwater sample collected at location SP-DP-2 east of the slag pile. However, the turbidity of the sample was elevated for both total and dissolved fractions and the soil samples collected from this boring did not have elevated metals concentrations. Therefore, the elevated metals concentrations in the reconnaissance groundwater samples collected from boring SP-DP-2 are not anticipated to be representative of groundwater conditions at the Property.

**Wetland area.** The isolated arsenic exceedance in surface soil collected at HC-WS-2 has been delineated. Samples collected surrounding this location during the data gaps investigation did not detect arsenic above the MTCA Method A CUL.

**Former powerhouse.** The extent of motor-oil-range TPH and mercury impacts to shallow soil has been delineated, and the extent of arsenic impacts to the west, north, and east has been delineated. The sample collected at 0.5 feet bgs at location PH-DP-4 exceeded the MTCA Method A CUL for arsenic. The deeper sample collected at this location did not exceed the CUL. Therefore, the vertical extent of contamination has been delineated. The lateral extent of arsenic contamination has not been delineated to the west in the vicinity of the former powerhouse.

**Former transformers.** The extent of mercury impacts to shallow soil has been delineated. The sample collected at 1.0 foot bgs at location TF-DP-1 exceeded the respective MTCA Method A CULs for arsenic and cadmium. The deeper sample collected at this location did not exceed MTCA Method A CULs. The sample collected at 0.5 feet bgs at location TF-DP-2 exceeded the MTCA Method A CUL for arsenic. The deeper sample collected at this location did not exceed the MTCA Method A CUL. Therefore, the vertical extent of contamination has been delineated. The lateral extent of arsenic and cadmium contamination has not been delineated to the north or east in the vicinity of the former power transformers.

Based on these conclusions, MFA recommends the following:

- A terrestrial ecological evaluation as described in WAC 173-340-7493 should be completed once development plans have been determined.
- Potential cleanup actions for impacted soil on the Property should be evaluated in concert with redevelopment plans.
- Additional soil investigation to delineate the lateral extent of metals impacts may be warranted prior to redevelopment given that more than half of the Property may remain

undeveloped, and therefore uncapped, with the potential for receptor exposure to shallow soil contamination. Areas for further delineation include:

  - Vehicle maintenance area: western and eastern extent of arsenic, cadmium, lead, and mercury exceedances.
  - Former foundry: eastern extent of cadmium and lead exceedances.
  - Slag pile: southwestern extent of cadmium exceedances.
  - Former powerhouse: western extent of arsenic exceedances.
  - Former transformers: northern and eastern extent of arsenic and cadmium exceedances.

- Given historical mining practices in the region, coal is present throughout the region and in several areas of the Property. Scientific studies show PAHs can be present in coal. At the Property, a total of 17 soil samples from the Property were analyzed for PAHs and all were non-detect or detected below MTCA CULs. As part of future earth-moving, construction, and development work at the Property, a soil management plan that includes consideration of coal should be prepared that describes the handling and disposal requirements for soil on the Property.
- Update the preliminary CSM based on additional evaluation completed.

# LIMITATIONS

The services undertaken in completing this report 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 report 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 report 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 report.

# REFERENCES


Ecology. 1994. *Natural Background Soil Metals Concentrations in Washington State.* Publication No. 94-115. Washington State Department of Ecology: Olympia, WA. October.

Ecology. 2005. *Toxics Cleanup Program Policy 840: Data Submittal Requirements.* Publication No. 16-09-050. Washington State Department of Ecology. August. Revised April 2016.

Ecology. 2018. *Crystal Creek Multi-Parameter Total Maximum Daily Load: Water Quality Effectiveness Monitoring Report.* Publication No. 18-10-007. Washington State Department of Ecology. February.

Ecology. 2023. Mary Monahan, Washington Department of Ecology Toxics Cleanup Program. *Comments on Data Gaps Investigation Report for Roslyn No. 4 Mine Site.* Letter to Dan Grausz, Forterra Roslyn LLC: Seattle, WA. June 5.

HC. 2004. *Preliminary Phase I and Limited Phase II Environmental Site Assessment, Section 17, Roslyn, Washington.* Prepared for MountainStar Resort Development. Hart Crowser, Inc. June 30.

HC. 2006. *Additional Environmental Assessment, Section 17, Roslyn, Washington.* Prepared for Suncadia LLC. Hart Crowser, Inc. September 18.

HC. 2007. *Phase II Environmental Site Assessment, Section 17/No. 4 Mine Area, Roslyn, Washington.* Prepared for Suncadia LLC. Hart Crowser, Inc. October 2.

ICE. 2020. Kathy Killman, LEG, Icicle Creek Engineers, Inc.: Carnation, WA. *Environmental Consultation Review of Environmental Assessment and Additional Testing, Forterra Roslyn Property, Kittitas County Parcel No. 456234, Roslyn, Washington.* Memorandum to Dan Grausz, Forterra Roslyn LLC. August 4.

MFA. 2020. *Phase I Environmental Site Assessment, Kittitas County Parcel 456234, Roslyn, Washington 98941.* Prepared for Forterra Roslyn LLC. Maul Foster & Alongi, Inc.: Vancouver, WA. October 7.

MFA. 2022. Emily Hess, LHG and Phil Wiescher, PhD, Maul Foster & Alongi, Inc. *Site Conditions of Roslyn Mine No. 4,* Kittitas *County Parcel 456234 in Roslyn, Washington 98941.* Memorandum to Jeff Newschwander and Mary Monahan, Washington State Department of Ecology. June 22.

MFA. 2023a. *Data Gaps Investigation Work Plan, Roslyn No. 4 Mine.* Prepared for Forterra Roslyn LLC. Maul Foster & Alongi, Inc.: Vancouver, WA. March 16.

MFA. 2023b. *Data Gaps Investigation Report, Roslyn No. 4 Mine.* Prepared for Forterra Roslyn LLC. Maul Foster & Alongi, Inc.: Vancouver, WA. May 22.

# TABLES



# Table 6-1
# Summary of Soil Analytical Results
# Roslyn No. 4 Mine, Roslyn, Washington
# Forterra Roslyn LLC

| Location | Sample Name | Collection Date | Collection Depth (ft bgs) | TPH (mg/kg) | | | Total Metals (mg/kg) | | | | | | | | | TCLP Metals (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Diesel-range hydrocarbons | Motor-oil-range hydrocarbons | Diesel+Oil[a] | Arsenic | Cadmium | Chromium | Chromium (Hexavalent) | Copper | Lead | Mercury | Nickel | Zinc | Lead |
| MTCA Method A, Unrestricted Land Use:[b](1) | | | | 2,000 | 2,000 | 2,000 | 20 | 2 | 2,000[c] | 19 | NV | 250 | 2 | NV | NV | NV |
| MTCA Method B, Noncancer:[b](1) | | | | NV | NV | NV | NA | NA | NA | NA | 3,200 | NV | NV | 1,600 | 24,000 | NV |
| MTCA Method B, Cancer:[b](1) | | | | NV | NV | NV | NA | NV | NV | NA | NV | NV | NV | NV | NV | NV |
| EPA Hazardous Waste Regulatory Level:[d] | | | | NV | NV | NV | NA | NV | NV | NA | NV | NV | NV | NV | NV | 5 |
| Washington State Background Metals, Yakima Basin:[2] | | | | NV | NV | NV | 5 | 1 | 38 | NV | 27 | 11 | 0.05 | 46 | 79 | NV |
| **Former Foundry** | | | | | | | | | | | | | | | | |
| FO-DP-1 | FO-DP-1-SB-1.0 | 04/11/2023 | 1.0 | -- | -- | -- | 2.56 | 1 U | 16.5 | -- | 11.1 | 6.95 | 1 U | 17.2 | 59.4 | -- |
| FO-DP-2 | FO-DP-2-SB-0.5 | 04/11/2023 | 0.5 | -- | -- | -- | 1.82 | 1 U | 16 | -- | 10 | 11.4 | 1 U | 14.6 | 56.7 | -- |
| FO-DP-3 | FO-DP-3-SB-0.5 | 04/11/2023 | 0.5 | -- | -- | -- | 15.4 | 5.45 | 33.8 | -- | 165 | 988 | 1 U | 36.8 | 1,720 | 1 U |
| | FO-DP-3-SB-2.5 | 04/11/2023 | 2.5 | -- | -- | -- | -- | 1 U | -- | -- | -- | 72.1 | -- | -- | -- | -- |
| FO-DP-4 | FO-DP-4-SB-0.5 | 04/11/2023 | 0.5 | -- | -- | -- | 2.48 | 1 U | 22.9 | -- | 12.1 | 6.86 | 1 U | 19 | 67.5 | -- |
| **Former Powerhouse** | | | | | | | | | | | | | | | | |
| PH-DP-1 | PH-DP-1-SB-1.5 | 04/12/2023 | 1.5 | 140 | 250 U | 270 | 4.96 | 1 U | 6.71 | -- | 57.2 | 13.2 | 1 U | 20.1 | 10.5 | -- |
| PH-DP-2 | PH-DP-2-SB-0.5 | 04/12/2023 | 0.5 | 50 U | 250 U | 250 U | 16.3 | 1 U | 10.3 | -- | 20.9 | 10.5 | 1 U | 15.3 | 113 | -- |
| PH-DP-3 | PH-DP-3-SB-0.8 | 04/12/2023 | 0.8 | 90 | 980 | 1,100 | 4.26 | 1 U | 10.8 | -- | 27.2 | 119 | 1 U | 8.95 | 62.3 | -- |
| PH-DP-4 | PH-DP-4-SB-0.5 | 04/12/2023 | 0.5 | 210 | 250 U | 340 | 46.5 J | 1.36 | 20.2 | -- | 75.2 J | 33.7 J | 1 U | 36.2 J | 173 J | -- |
| | PH-DP-4-SB-2.5 | 04/12/2023 | 2.5 | -- | -- | -- | 7.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| PH-DP-5 | PH-DP-5-SB-0.8 | 04/12/2023 | 0.8 | 50 U | 610 | 640 | 4.96 | 1 U | 17.4 | -- | 29.5 | 21.1 | 1 U | 16.2 | 62.2 | -- |
| | PH-DP-5-SB-0.8-DUP | 04/12/2023 | 0.8 | 130 | 1,100 | 1,200 | 4.51 | 1 U | 15.2 | -- | 26.4 | 15.7 | 1 U | 15.3 | 59.5 | -- |
| **Slag Pile** | | | | | | | | | | | | | | | | |
| SP-DP-1 | SP-DP-1-SB-0.5 | 04/11/2023 | 0.5 | -- | -- | -- | 4.85 | 1 U | 24 | -- | 25.1 | 14.7 | 1 U | 20.5 | 51.1 | -- |
| SP-DP-2 | SP-DP-2-SB-0.5 | 04/11/2023 | 0.5 | -- | -- | -- | 3.95 | 1 U | 39.5 | -- | 17.5 | 14.6 | 1 U | 64.6 | 45.4 | -- |
| | SP-DP-2-SB-0.5-DUP | 04/11/2023 | 0.5 | -- | -- | -- | 4.41 | 1 U | 41 | 0.613 U | 22.6 | 41.7 | 1 U | 60.6 | 56.2 | -- |
| SP-DP-3 | SP-DP-3-SB-0.5 | 04/11/2023 | 0.5 | -- | -- | -- | 9.78 | 2.66 | 19.2 | -- | 80.2 | 91.3 J | 1 U | 31.7 | 242 | -- |
| | SP-DP-3-SB-0.5-DUP | 04/11/2023 | 0.5 | -- | -- | -- | -- | 2.32 | -- | -- | -- | -- | -- | -- | -- | -- |
| | SP-DP-3-SB-2.5 | 04/11/2023 | 2.5 | -- | -- | -- | -- | 1 U | -- | -- | -- | -- | -- | -- | -- | -- |
| **Former Transformers** | | | | | | | | | | | | | | | | |
| TF-DP-1 | TF-DP-1-SB-1.0 | 04/12/2023 | 1.0 | -- | -- | -- | 38.1 | 3.54 | 17.6 | -- | 138 | 24.3 | 1 U | 30.7 | 108 | -- |
| | TF-DP-1-SB-3.0 | 04/12/2023 | 3.0 | -- | -- | -- | 1 U | 1 U | -- | -- | -- | -- | -- | -- | -- | -- |
| TF-DP-2 | TF-DP-2-SB-0.5 | 04/12/2023 | 0.5 | -- | -- | -- | 24.7 | 1.87 | 23.8 | -- | 69.7 | 50.8 | 1 U | 31.8 | 141 | -- |
| | TF-DP-2-SB-2.5 | 04/12/2023 | 2.5 | -- | -- | -- | 6.16 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **Vehicle Maintenance** | | | | | | | | | | | | | | | | |
| VM-DP-1 | VM-DP-1-SB-0.5 | 04/12/2023 | 0.5 | -- | -- | -- | 14.6 | 1 U | 12.1 | -- | 53.8 | 67.9 | 1 U | 19.2 | 105 | -- |
| VM-DP-2 | VM-DP-2-SB-0.5 | 04/12/2023 | 0.5 | -- | -- | -- | 9.08 | 1 U | 13.7 | -- | 60.1 | 81 | 1 U | 24.5 | 108 | -- |
| VM-DP-3 | VM-DP-3-SB-0.5 | 04/12/2023 | 0.5 | -- | -- | -- | 25.9 | 5.33 | 39.8 | -- | 106 | 301 | 1 U | 25 | 4,110 | 1 U |
| | VM-DP-3-SB-2.5 | 04/12/2023 | 2.5 | -- | -- | -- | 3.5 | 1 U | -- | -- | -- | 6.49 | -- | -- | -- | -- |
| VM-DP-4 | VM-DP-4-SB-0.5 | 04/11/2023 | 0.5 | -- | -- | -- | 9.52 | 1 U | 14.2 | -- | 63 | 28.7 | 1 U | 26.4 | 67.7 | -- |

© 2023 Maul Foster Alongi, Inc.

# Table 6-1
# Summary of Soil Analytical Results
# Roslyn No. 4 Mine, Roslyn, Washington
# Forterra Roslyn LLC

| Location | Sample Name | Collection Date | Collection Depth (ft bgs) | TPH (mg/kg) | | | Total Metals (mg/kg) | | | | | | | | | TCLP Metals (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Diesel-range hydrocarbons | Motor-oil-range hydrocarbons | Diesel+Oil[a] | Arsenic | Cadmium | Chromium | Chromium (Hexavalent) | Copper | Lead | Mercury | Nickel | Zinc | Lead |
| MTCA Method A, Unrestricted Land Use:[b][1] | | | | 2,000 | 2,000 | 2,000 | 20 | 2 | 2,000[c] | 19 | NV | 250 | 2 | NV | NV | NV |
| MTCA Method B, Noncancer:[b][1] | | | | NV | NV | NV | NA | NA | NA | NA | 3,200 | NV | NV | 1,600 | 24,000 | NV |
| MTCA Method B, Cancer:[b][1] | | | | NV | NV | NV | NA | NV | NV | NA | NV | NV | NV | NV | NV | NV |
| EPA Hazardous Waste Regulatory Level:[d] | | | | NV | NV | NV | NA | NV | NV | NA | NV | NV | NV | NV | NV | 5 |
| Washington State Background Metals, Yakima Basin:[2] | | | | NV | NV | NV | 5 | 1 | 38 | NV | 27 | 11 | 0.05 | 46 | 79 | NV |
| **Wetland** | | | | | | | | | | | | | | | | |
| WL-DP-1 | WL-DP-1-SB-0.5 | 04/12/2023 | 0.5 | -- | -- | -- | 4.61 | 1 U | 30.2 | -- | 27.4 | 11.9 | 1 U | 25.2 | 65.2 | -- |
| | WL-DP-1-SB-0.5-DUP | 04/12/2023 | 0.5 | -- | -- | -- | 5.73 | 1 U | 31.7 | -- | 28.1 | 13.2 | 1 U | 25.6 | 69.5 | -- |
| WL-DP-2 | WL-DP-2-SB-0.3 | 04/12/2023 | 0.3 | -- | -- | -- | 3.82 | 1 U | 23.3 | -- | 23.4 | 10.7 | 1 U | 20.2 | 73.2 | -- |
| WL-DP-3 | WL-DP-3-SB-0.5 | 04/12/2023 | 0.5 | -- | -- | -- | 3.69 | 1 U | 19.2 | -- | 14 | 5.57 | 1 U | 26.2 | 49 | -- |
| WL-DP-4 | WL-DP-4-SB-0.5 | 04/12/2023 | 0.5 | -- | -- | -- | 6.47 | 1 U | 12.5 | -- | 92.2 | 15.7 | 1 U | 26.4 | 36.3 | -- |

**Notes**

Shading (color key below) indicates values that exceed screening criteria; non-detects (U) were not compared with screening criteria.

MTCA Method A, Unrestricted Land Use

Washington State background metals values are shown for reference only and are not shaded for exceedances.

-- = not analyzed.

EPA = U.S. Environmental Protection Agency.

ft bgs = feet below ground surface.

J = result is estimated.

mg/kg = milligrams per kilogram.

mg/L = milligrams per liter.

MTCA = Model Toxics Control Act.

NA = not applicable.

NV = no value.

TCLP = toxicity characteristic leaching procedure.

TPH = total petroleum hydrocarbons.

U = result is non-detect at the method reporting limit.

[a]Diesel+Oil is the sum of diesel-range and motor-oil-range hydrocarbons. When results are non-detect, half the reporting limit is used. When both results are non-detect, the highest reporting limit is shown.

[b]When MTCA Method A value is available, value is not screened to MTCA Method B.

[c]Screening level for trivalent chromium.

[d]Toxicity characteristic regulatory limit from EPA 40 CFR Part 261.24 Table 1.

**References**

[1]Ecology. 2023. *Cleanup Levels and Risk Calculation (CLARC) table.* Washington State Department of Ecology, Toxics Cleanup Program. January.

[2]Ecology. 1994. *Natural Background Soil Metals Concentrations in Washington State.* Publication 94-115. Washington State Department of Ecology. October.

© 2023 Maul Foster Alongi, Inc.

# Table 6-2
# Summary of Groundwater Analytical Results
# Roslyn No. 4 Mine, Roslyn, Washington
# Forterra Roslyn LLC

| Feature of Interest: | MTCA Method A[(a)(1)] | MTCA Method B[(a)(1)] | | Former Powerhouse | Slag Pile | | Tailings Pile |
|---|---|---|---|---|---|---|---|
| Location: | | | | PH-DP-4 | SP-DP-2 | | TA-DP-1 |
| Sample Name: | | | | PH-DP-4-GW-10.0 | SP-DP-2-GW-15.0[(b)] | SP-DP-2-GW-15.0-DUP[(b)] | TA-DP-1-GW-10.0 |
| Collection Date: | | Noncancer | Cancer | 04/12/2023 | 04/12/2023 | 04/12/2023 | 04/13/2023 |
| Collection Depth (ft bgs): | | | | 10.0 | 15.0 | 15.0 | 10.0 |
| **Dissolved Metals—Field-Filtered (ug/L)** | | | | | | | |
| Arsenic | 5 | NA | NA | -- | 34.2 J- | 39.7 J- | -- |
| Chromium | 50 | NV | NV | -- | 22.1 J | 1 UJ | -- |
| Lead | 15 | NV | NV | -- | 8.35 J | 1 UJ | -- |
| **Dissolved Metals—Laboratory-Filtered (ug/L)** | | | | | | | |
| Arsenic | 5 | NA | NA | -- | 21.5 J | 20.8 J | -- |
| Chromium | 50 | NV | NV | -- | 1 U | 1 U | -- |
| Lead | 15 | NV | NV | -- | 1 U | 1 U | -- |
| **Total Metals (ug/L)** | | | | | | | |
| Arsenic | 5 | NA | NA | 2.05 | 35.7 J- | 35.1 J- | 1.48 |
| Cadmium | 5 | NV | NA | 1 U | 2.53 | 2.5 | 1 U |
| Chromium | 50 | NV | NV | 9.96 | 159 | 166 | 2.23 |
| Copper | NV | NV | 640 | 11.4 | 251 | 257 | 5 U |
| Lead | 15 | NV | NV | 2.73 | 58.1 | 60.9 | 1 U |
| Mercury | 2 | NV | NV | 1 U | 1 U | 1 U | 1 U |
| Nickel | NV | NV | 320 | 9.14 | 215 | 229 | 4.24 |
| Zinc | NV | NV | 4,800 | 21.6 | 293 | 244 | 5.37 |

© 2023 Maul Foster Alongi, Inc.

# Table 6-2
# Summary of Groundwater Analytical Results
# Roslyn No. 4 Mine, Roslyn, Washington
# Forterra Roslyn LLC

**Notes**

Shading (color key below) indicates values that exceed screening criteria; non-detects (U and UJ) were not compared with screening criteria.

MTCA Method A

-- = not analyzed.

ft bgs = feet below ground surface.

J = result is estimated.

J- = result is estimated, but the result may be biased low.

MTCA = Model Toxics Control Act.

NA = not applicable.

NV = no value.

U = result is non-detect at the method reporting limit.

ug/L = micrograms per liter.

UJ = result is non-detect with an estimated method reporting limit.

[a]When MTCA Method A value is available, value is not screened to MTCA Method B.

[b]Both a field-filtered and a laboratory-filtered fraction were analyzed. See data validation memorandum (Appendix E).

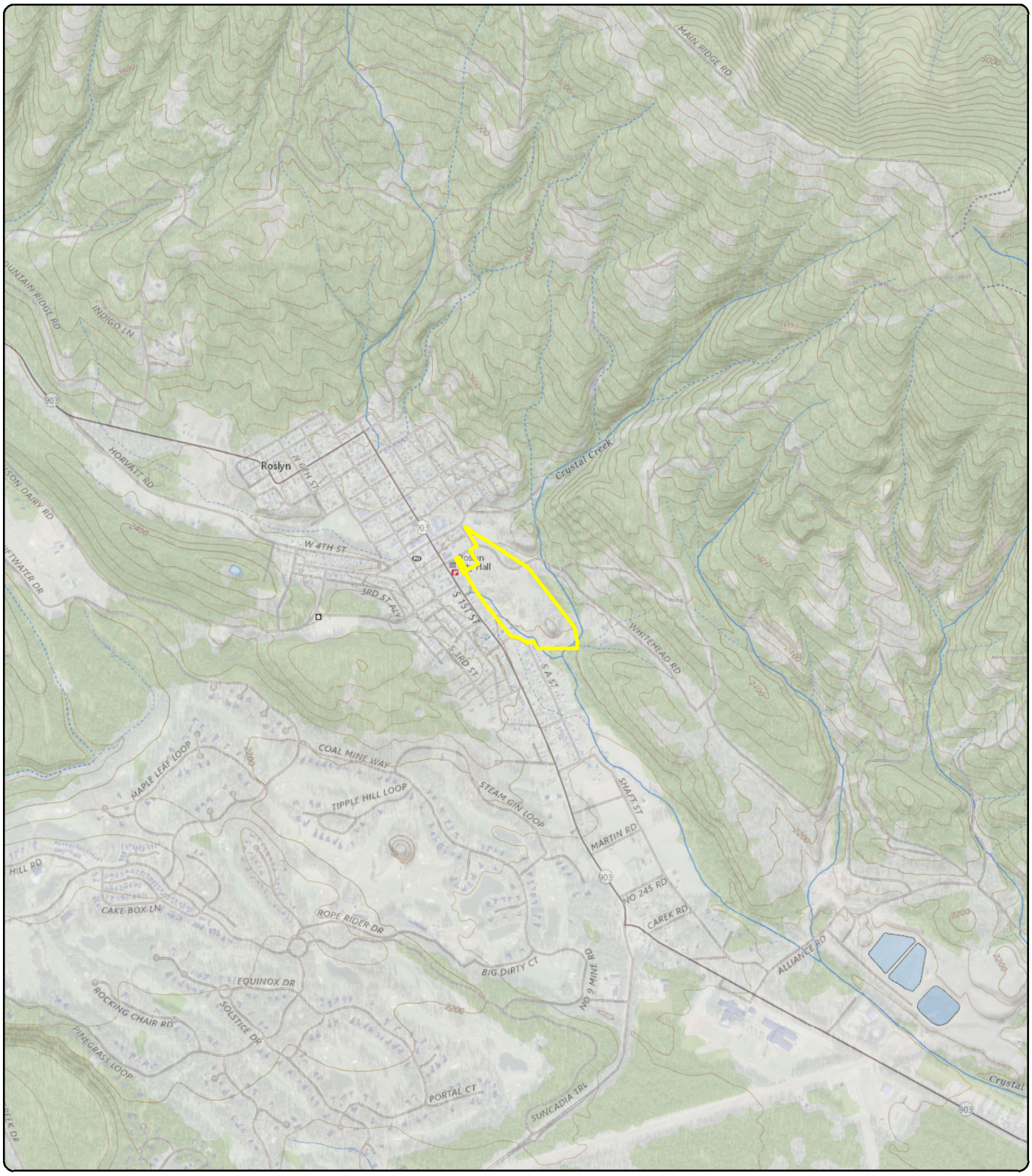
**Reference**

[1]Ecology. 2023. *Cleanup Levels and Risk Calculation (CLARC) table*. Washington State Department of Ecology, Toxics Cleanup Program. January.

© 2023 Maul Foster Alongi, Inc.

# FIGURES






**Data Sources**
US Geological Survey (2020) 7.5-minute topographic quadrangle: Cle Elum; township 20 north, range 15 east, section 17; property boundary obtained from Kittitas County.

**Legend**

Property Boundary

# Figure 1-1
## Property Location

Roslyn No. 4 Mine
205 E Dakota Avenue
Roslyn, Washington

0 1,000 2,000
Feet

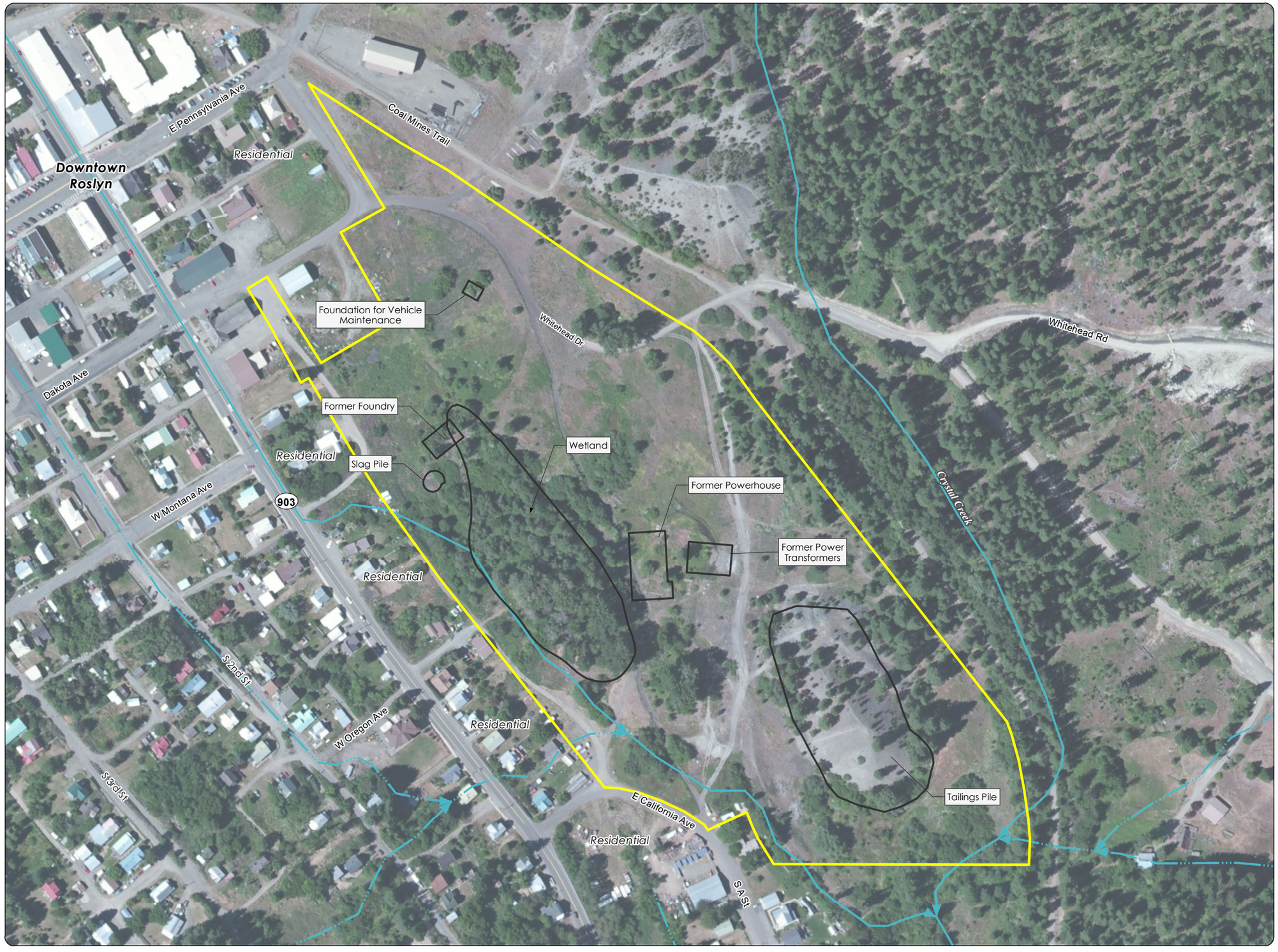
MAUL FOSTER ALONGI
p. 971 544 2139 | www.maulfoster.com

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Path: X:\1122.05\003\Fig1_1_Property_Location.mxd
Print Date: 5/15/2023
Approved By: ehess
Produced By: abixby
Project: M1122.05.003

# Figure 2-1
# Property Features of Interest

Roslyn No. 4 Mine
205 E Dakota Avenue
Roslyn, Washington




## Legend

- Features of Interest
- Property Boundary
- Perennial Stream
- Intermittent Stream

**Note**
Features are approximate.

0 100 200
Feet

**Data Sources**
Aerial photograph obtained from Mapbox;
Tax lot data obtained from Kittitas County GIS;
Site features obtained from Hart Crowser Phase I environmental site assessment (2004), Icicle Creek Engineers assessment (2020), and from MFA site reconnaissance (9/17/2020);
Hydrography data obtained from the U.S. Geological Survey National Hydrography Dataset.

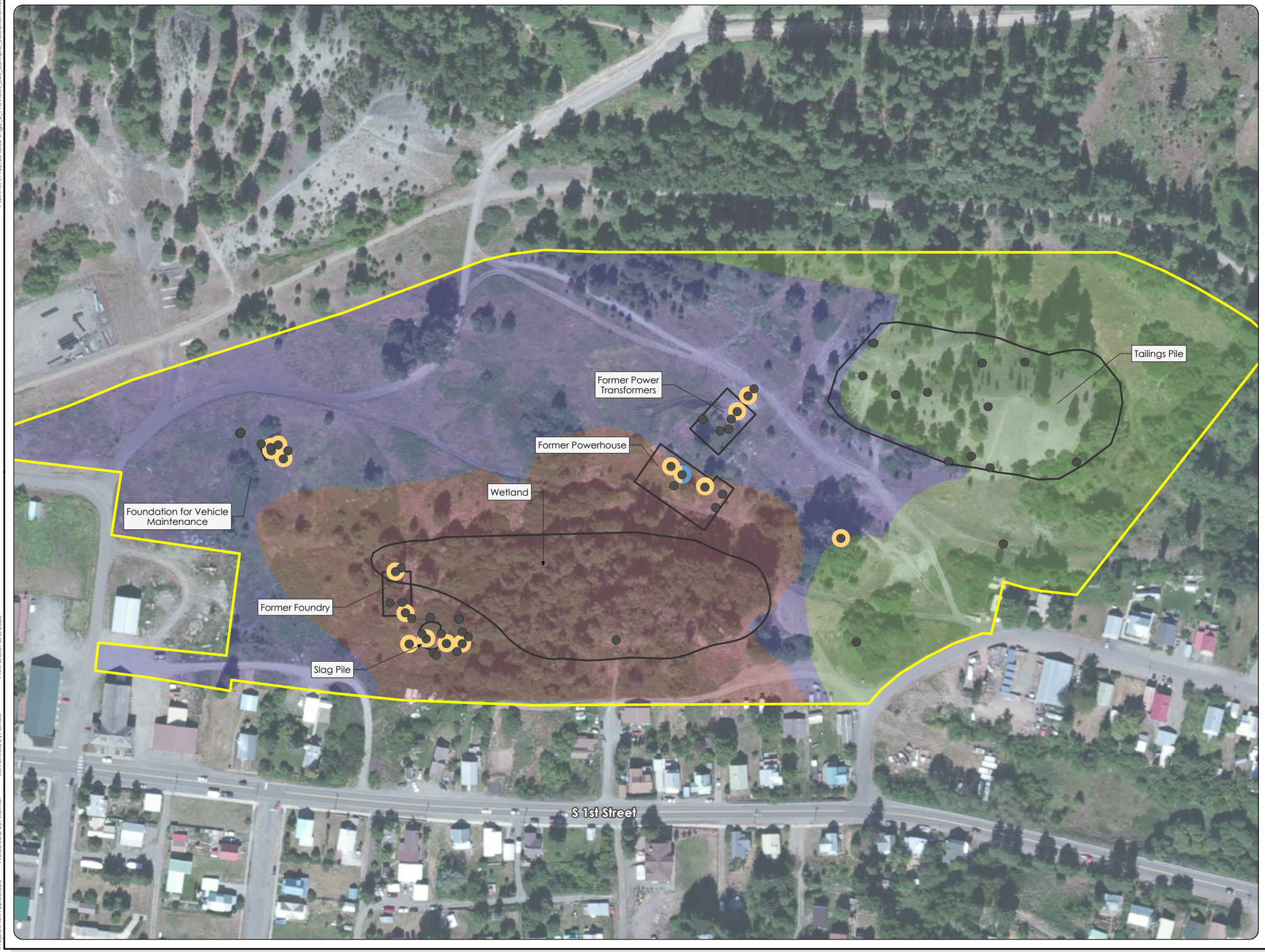
MAUL FOSTER ALONGI
p. 971 544 2139 | www.maulfoster.com

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Path: X:\1122.05003\Fig2_1_Property_Features.mxd
Print Date: 5/15/2023
Approved By: ehess
Produced By: abixby
Project: M1122.05.003

# Figure 2-2
# Previous Soil Sample Locations and MTCA Exceedances

Roslyn No. 4 Mine
205 E Dakota Avenue
Roslyn, Washington




**Legend**

- Features of Interest
- Property Boundary
- Soil Sample Location
- Natural Space with Wetland Improvements
- Open Space with Community Amenity
- Residential and Mixed-Use Development

**Exceedance Type**

- MTCA A: Metals and TPH
- MTCA A: Metals

**Notes**

Features of interest and sample locations are obtained by others, and are approximate.
MTCA = Model Toxics Control Act.
MTCA A = MTCA Method A, unrestricted land use.
TPH = diesel- and heavy-oil total petroleum hydrocarbons.

0 100 200
Feet

**Data Sources**

Aerial photograph obtained from Esri;
tax lot data obtained from Kittitas County.

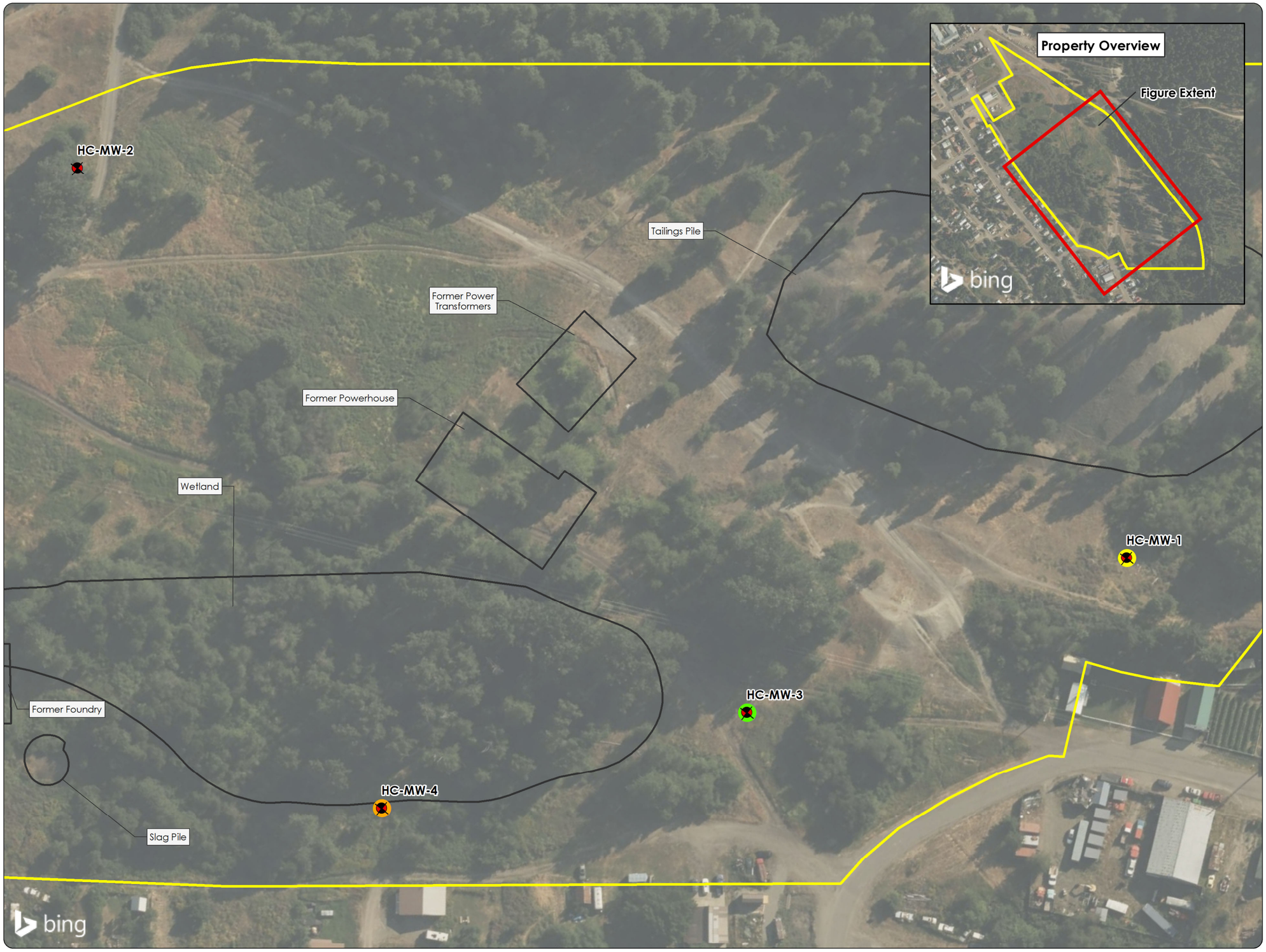
MAUL FOSTER ALONGI
p. 971 544 2139 | www.maulfoster.com

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Path: X:\1122.05\003\Fig2_2_Previous_Soil_Sample_Locations.mxd
Print Date: 6/8/2023
Reviewed By: ehess
Produced By: stumer
Project: M1122.05.003

# Figure 2-3
# Previous Groundwater Sample Locations and MTCA Exceedances

Roslyn No. 4 Mine
205 E Dakota Avenue
Roslyn, Washington




**Legend**

- Miniwell Location (HC 2007)
- Features of Interest
- Property Boundary

**Exceedance Type**

- MTCA A: Arsenic
- MTCA A: Lead
- MTCA A: Lead, Chromium, Arsenic

**Notes**

Sample locations obtained from HC (2007) and are approximate.
HC = Hart Crowser, Inc.
MTCA = Model Toxics Control Act.
MTCA A = MTCA Method A total metals for groundwater.

0 50 100
Feet

**Data Sources**

Aerial photograph obtained from Bing;
tax lot data obtained from Kittitas County.

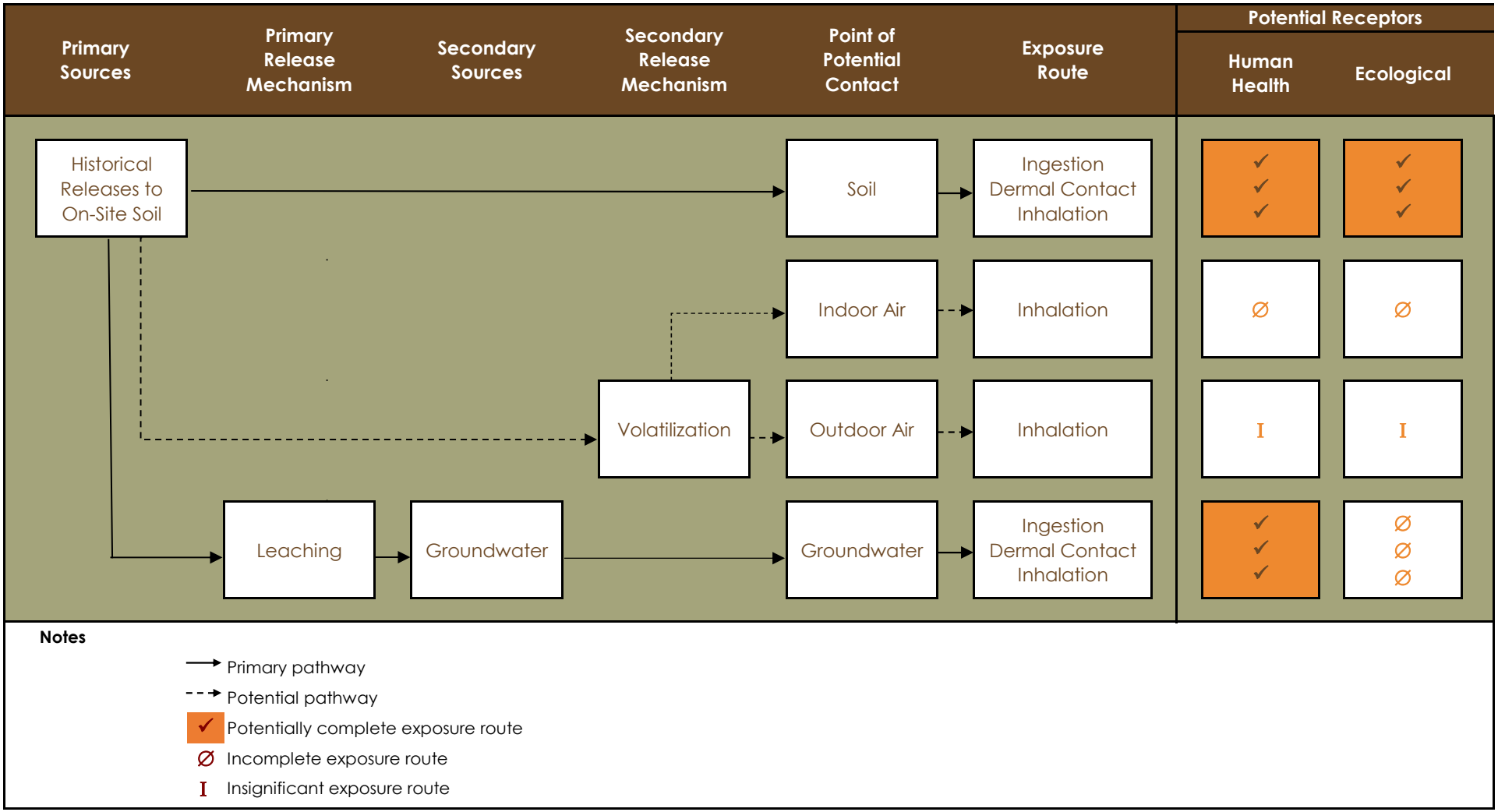
MAUL FOSTER ALONGI
p. 971 544 2139 | www.maulfoster.com

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Path: X:\1122.05\003\Fig2_3_Previous_GW_Locs_MTCA_Exceedence.mxd
Print Date: 5/16/2023
Reviewed By: ehess
Produced By: abixby
Project: M1122.05.003

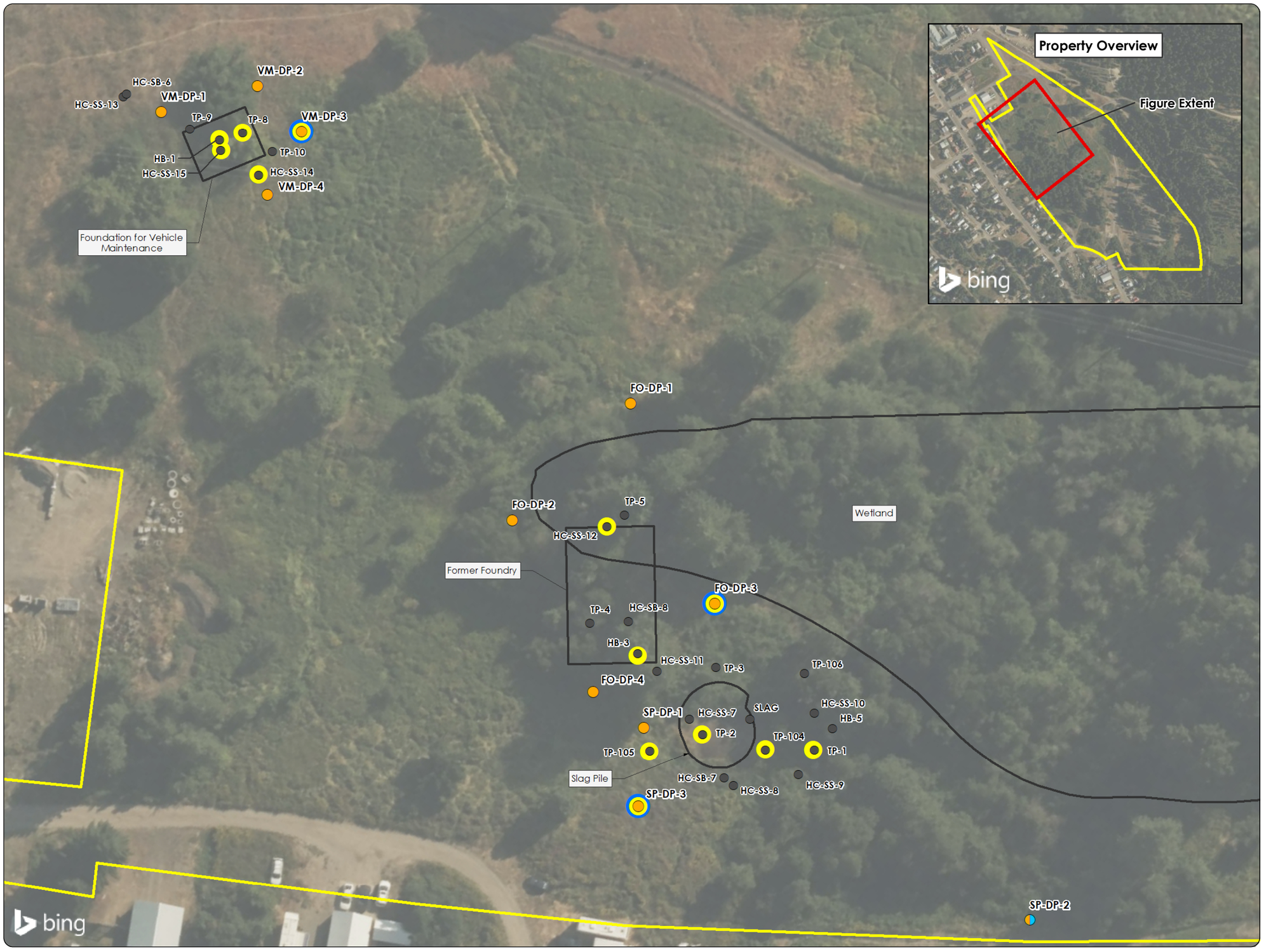
MAUL FOSTER ALONGI

**Figure 4-1**
**Preliminary Conceptual Site Model**
**Roslyn No. 4 Mine**
**Roslyn, WA**



# Figure 5-1
# Soil Sample Locations and MTCA Exceedances for Western Portion of Property

Roslyn No. 4 Mine
205 E Dakota Avenue
Roslyn, Washington




**Legend**

- Soil Boring (2023)
- Soil and Groundwater Boring (2023)
- Soil Sample (2004-2020)
- Features of Interest
- Property Boundary

**Exceedance**

- MTCA A: Metals in Soil

**Coal Presence**

- Coal Noted at Location

**Notes**

Boring locations were recorded with a handheld GPS with sub-meter accuracy.
Coal presence halos are based on whether coal was noted in geologic log. Soil descriptions are not available for locations HC-SS-1 through HC-SS-15.
Exceedance halos are shown for soil results only.
Property features and previous sample locations were obtained by others, and are approximate.
MTCA = Model Toxics Control Act.
MTCA A = MTCA Method A, unrestricted land use.

0 40 80
Feet

**Data Sources**

Aerial photograph obtained from Bing;
tax lot data obtained from Kittitas County.

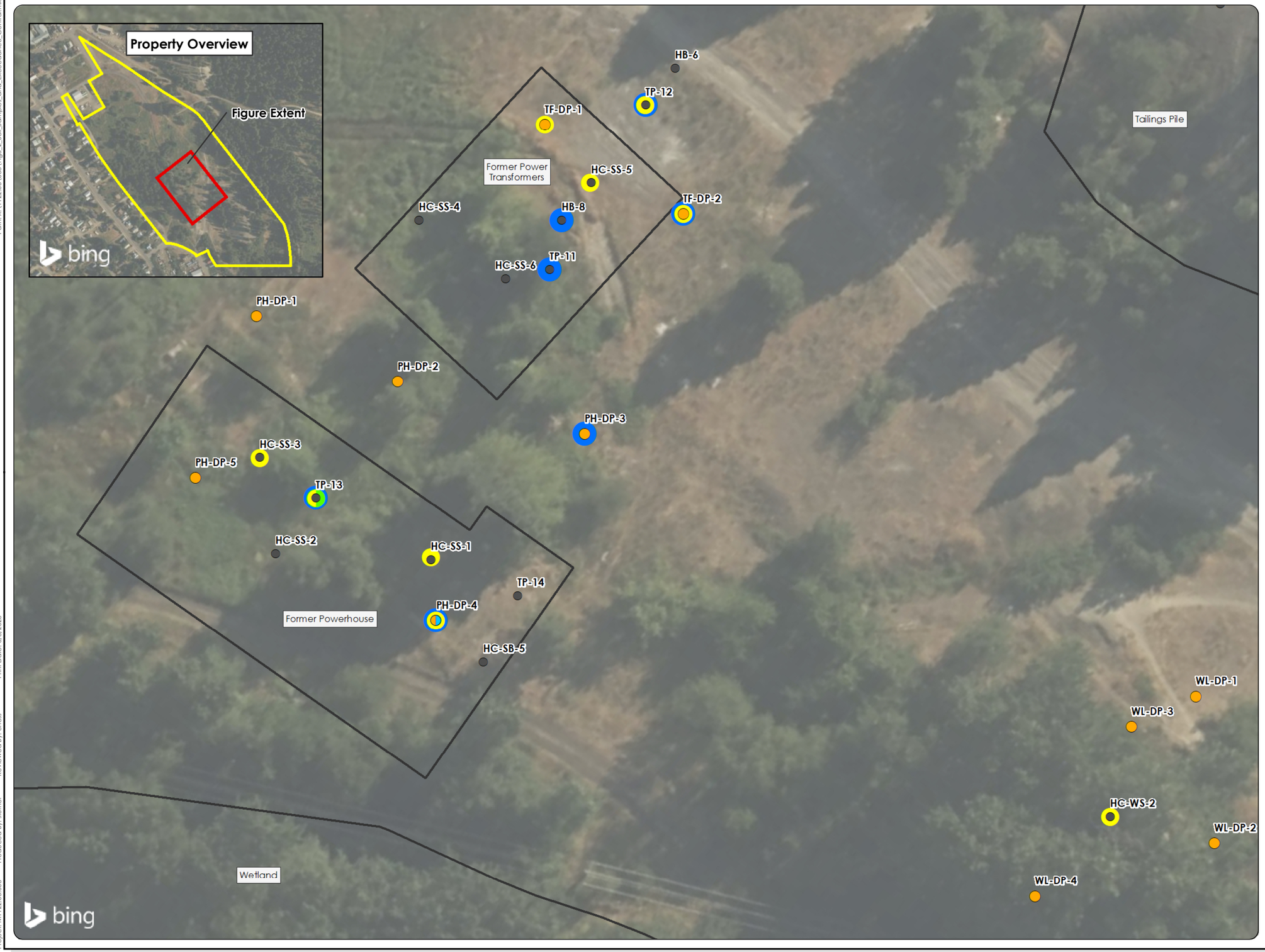
MAUL FOSTER ALONGI
p. 971 544 2139 | www.maulfoster.com

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Path: X:\1122.05\003\Figs_1_Soil_Samples_and_Exceedances_Western.mxd
Print Date: 6/8/2023
Reviewed By: ehess
Produced By: sturner
Project: M1122.05.003

# Figure 5-2
# Soil Sample Locations and MTCA Exceedances for Central Portion of Property

Roslyn No. 4 Mine
205 E Dakota Avenue
Roslyn, Washington




## Legend

- Soil Boring (2023)
- Soil and Groundwater Boring (2023)
- Soil Sample (2004-2020)
- Features of Interest
- Property Boundary
- MTCA A: Metals and TPH in Soil
- MTCA A: Metals in Soil

**Coal**

- Coal Noted at Location

**Notes**

Boring locations were recorded with a handheld GPS with sub-meter accuracy.
Coal presence halos are based on whether coal was noted in geologic log. Soil descriptions are not available for locations HC-SS-1 through HC-SS-15.
Exceedance halos are shown for soil results only.
Property features and previous sample locations were obtained by others, and are approximate.
MTCA = Model Toxics Control Act.
MTCA A = MTCA Method A, unrestricted land use.
TPH = diesel- and heavy-oil total petroleum hydrocarbons.

0 25 50
Feet

**Data Sources**

Aerial photograph obtained from Bing;
tax lot data obtained from Kittitas County.

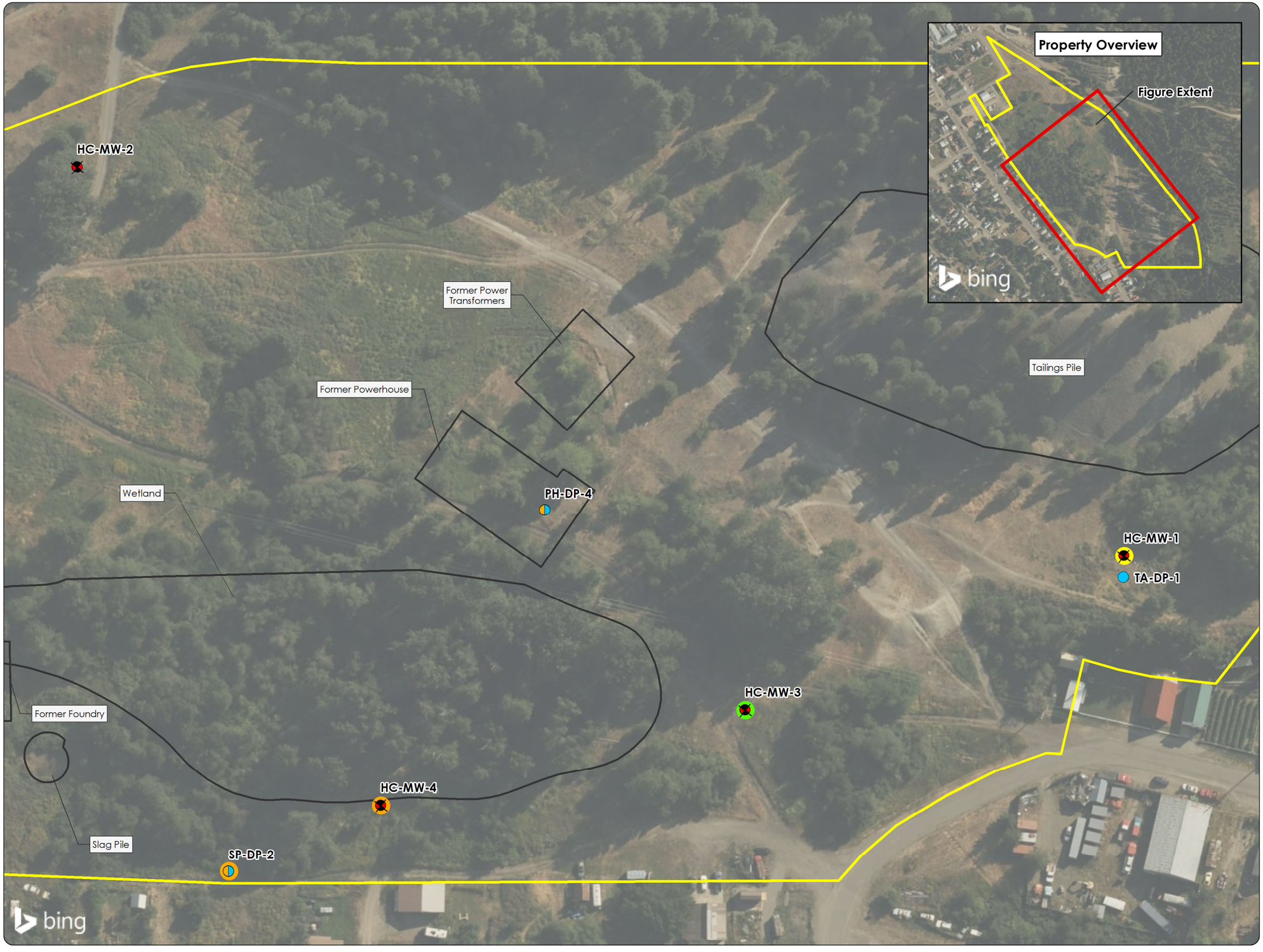
MAUL FOSTER ALONGI
p. 971 544 2139 | www.maulfoster.com

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Path: X:\1122.05\003\Fig5_2_Soil_Samples_and_Exceedance_Central.mxd
Print Date: 6/8/2023
Reviewed By: ehess
Produced By: sturner
Project: M1122.05.003

# Figure 5-3
# Groundwater Sample Locations and MTCA Exceedances

Roslyn No. 4 Mine
205 E Dakota Avenue
Roslyn, Washington




**Legend**

- Groundwater Boring (2023)
- Soil and Groundwater Boring (2023)
- Miniwell Location (HC 2007)
- Features of Interest
- Property Boundary

**Exceedance Type**

- MTCA A: Arsenic
- MTCA A: Lead
- MTCA A: Lead, Chromium, Arsenic

**Notes**

Boring locations were recorded with a handheld GPS with sub-meter accuracy.
Exceedance halos are shown for groundwater results only. Where both total and dissolved metals were analyzed, dissolved results are shown.
Property features were obtained by others, and are approximate.
Miniwell locations were obtained from HC (2007) and are approximate.
HC = Hart Crowser, Inc.
MTCA = Model Toxics Control Act.
MTCA A = MTCA Method A total metals for groundwater.

0 50 100
Feet

**Data Sources**

Aerial photograph obtained from Bing;
tax lot data obtained from Kittitas County.

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

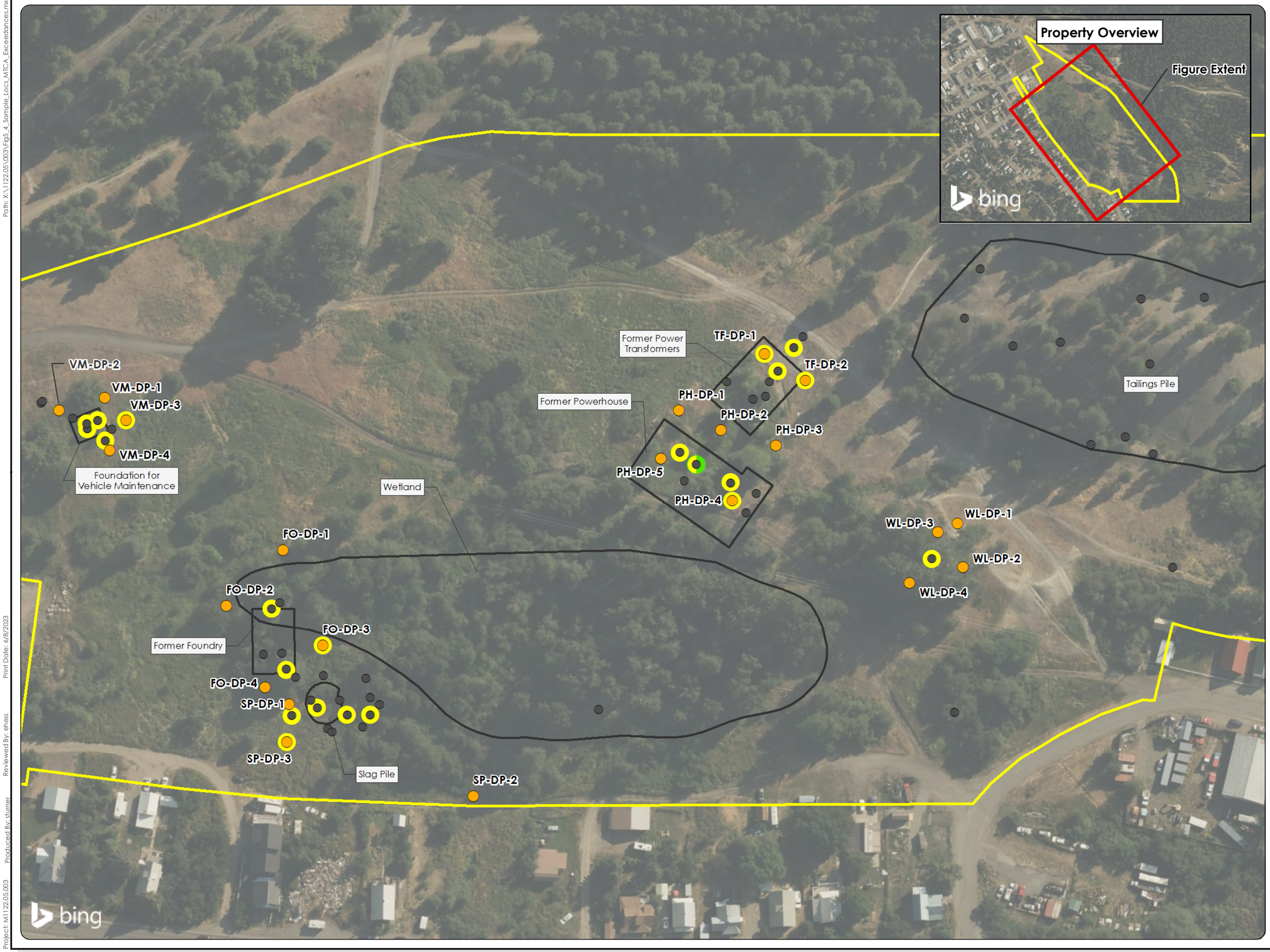
This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Path: X:\1122.05\003\Fig5_3_Previous_and_Proposed_GW_Samples_v2.mxd
Print Date: 5/22/2023
Reviewed By: ehess
Produced By: dbixby
Project: M1122.05.003

Path: X:\1122.05\003\Fig5_4_Sample_Locs_MTCA_Exceedances.mxd
Print Date: 6/8/2023
Reviewed By: ehess
Produced By: stumer
Project: M1122.05.003

# Figure 5-4
# Soil Sample Locations and MTCA Exceedances

Roslyn No. 4 Mine
205 E Dakota Avenue
Roslyn, Washington




**Legend**

- Soil Boring (2023)
- Soil Sample (2004-2020)
- Features of Interest
- Property Boundary

**Exceedances**

- MTCA A: Metals and TPH
- MTCA A: Metals

**Notes**

Boring locations were recorded with a handheld GPS with sub-meter accuracy.
Only 2023 sample locations are labelled.
Previous sample locations and property features obtained by others, and are approximate.
MTCA = Model Toxics Control Act.
MTCA A = MTCA Method A.

0 60 120
Feet

**Data Sources**

Aerial photograph obtained from Bing;
tax lot data obtained from Kittitas County.

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

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

# APPENDIX A
## PHOTOGRAPH LOG

# PHOTOGRAPHS

Project Name: Roslyn No. 4 Mine Data Gaps Investigation
Project Number: M1122.05.003
Location: Roslyn, Washington

**Photo No. 1.**

**Description**
Representative photo of soil on the Property. Soil core pictured was collected from boring location PH-DP-4.




**Photo No. 2.**

**Description**
Ceramic material observed in soil core collected from boring PH-DP-2 at approximately 0.2 feet below ground surface.



# PHOTOGRAPHS

Project Name: Roslyn No. 4 Mine Data Gaps Investigation
Project Number: M1122.05.003
Location: Roslyn, Washington

**Photo No. 3.**

**Description**
Coal observed in soil collected from boring PH-DP-3 at approximately 0.5 feet below ground surface.



**Photo No. 4.**

**Description**
Surface water observed within wetlands near boring location FO-DP-1.



# PHOTOGRAPHS

Project Name: Roslyn No. 4 Mine Data Gaps Investigation
Project Number: M1122.05.003
Location: Roslyn, Washington

**Photo No. 5.**

**Description**
Labeled investigation-derived waste, 55-gallon drums located on southeast portion of the Property.



**Photo No. 6.**

**Description**
Groundwater sample containers from boring PH-DP-4. Unfiltered (left) and field-filtered (right).



# PHOTOGRAPHS

Project Name: Roslyn No. 4 Mine Data Gaps Investigation
Project Number: M1122.05.003
Location: Roslyn, Washington

**Photo No. 7.**

**Description**
Sample bottles with groundwater collected from boring SP-DP-2. Note elevated turbidity. The three polyethylene bottles on the right were filtered in the field using a 0.45-micron filter and were used by the laboratory for dissolved metal analysis. The three polyethylene bottles on the left were not filtered and were used by the laboratory for total metal analysis. Additional unpreserved polyethylene bottles (not pictured) were used to collect groundwater samples to be filtered at the lab.



# APPENDIX B
## GEOLOGIC BORING LOGS

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **FO-DP-1** | **1 of 1** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/11/23 to 4/11/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **5.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Percent Recovery | Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 1 | ▽ | | | | | | 0.0 to 0.5 feet: GRAVEL (GP); gray; 100% gravel, coarse, angular; dry. |
| 2 | | 62 | | **FO-DP-1-SB-1.0** | **0.0** | | 0.5 to 3.1 feet: SILTY SAND (SM); brown; 40% fines, medium plasticity; 60% sand, fine to coarse; loose; no odor; moist to wet. |
| 3 | | | | | **0.0** | | @ 2.0 feet: Orangish brown. |
| 4 | | | | | | | 3.1 to 5.0 feet: NO RECOVERY. |
| 5 | | | | | | | |

Total Depth = 5.0 feet bgs

***NOTES:***

*1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.*

***Borehole Abandonment Details***
*0 to 5.0 feet: 2.25-inch borehole.*
*0 to 5.0 feet: Bentonite chips hydrated with potable water.*

▽ *Soil becomes wet at 0.5 feet bgs as observed in core sample.*

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **FO-DP-2** | **1 of 1** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/11/23 to 4/11/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **5.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Percent Recovery | Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 1 | ▽ | | | **FO-DP-2-SB-0.5** | **0.0** | | *0.0 to 0.8 feet: SILT WITH SAND (ML); blackish brown; 80% fines, medium plasticity; 20% sand, fine to medium; 30% organic material (rootlets); no odor; moist to wet.* |
| 2 | | **58** | | | **0.0** | | *0.8 to 2.9 feet: SANDY SILT (ML); 60% fines, medium plasticity; 40% sand, fine to coarse; trace organic material (rootlets); no odor; wet.* |
| 3 | | | | | | | *2.9 to 5.0 feet: NO RECOVERY.* |
| 4 | | | | | | | |
| 5 | | | | | | | |

*Total Depth = 5.0 feet bgs*

***NOTES:***

*1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.*

***Borehole Abandonment Details***
*0 to 5.0 feet: 2.25-inch borehole.*
*0 to 5.0 feet: Bentonite chips hydrated with potable water.*

▽ *Soil becomes wet at 0.8 feet bgs as observed in core sample.*

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **FO-DP-3** | **1 of 1** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/11/23 to 4/11/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **5.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Percent Recovery | Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 1 | | | | **FO-DP-3-SB-0.5** | **0.0** | | 0.0 to 1.6 feet: SILTY SAND (SM); dark brown; 35% fines, low plasticity; 65% sand, fine to coarse; loose; no odor; dry. |
| 2 | | | | | | | 1.6 to 2.1 feet: COAL. |
| 3 | | **68** | | **FO-DP-3-SB-2.5** | **0.0** | | 2.1 to 3.4 feet: SILTY SAND (SM); grayish brown; 40% fines, low plasticity; 60% sand, fine to coarse; dense; no odor; trace iron mottling; moist to wet. |
| 4 | | | | | | | 3.4 to 5.0 feet: NO RECOVERY. |
| 5 | | | | | | | |

Total Depth = 5.0 feet bgs

***NOTES:***

*1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.*

***Borehole Abandonment Details***
*0 to 5.0 feet: 2.25-inch borehole.*
*0 to 5.0 feet: Bentonite chips hydrated with potable water.*

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **FO-DP-4** | **1 of 1** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/11/23 to 4/11/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **10.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Sample Data: Percent Recovery | Sample Data: Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 1 | | | | **FO-DP-4-SB-0.5** | **0.0** | | 0.0 to 3.8 feet: SANDY SILT (ML); brown; 60% fines, low plasticity; 40% sand, fine to coarse; trace organic material (rootlets); stiff; no odor; moist. |
| 2 | | **76** | | | | | |
| 3 | | | | | **0.0** | | |
| 4 | | | | | | | 3.8 to 5.0 feet: NO RECOVERY. |
| 5 | | | | | | | 5.0 to 9.4 feet: SANDY SILT (ML); grayish brown; 60% fines, low plasticity; 40% sand, fine to coarse; stiff; no odor; trace iron mottling; moist. |
| 6 | ▽ | | | | | | @ 5.5 to 5.8 feet: Becomes wet.<br>@ 6.0 feet: Grades to 70% fines. |
| 7 | | **88** | | | | | @ 7.4 feet: Black material; no odor. |
| 8 | | | | | | | |
| 9 | | | | | **0.0** | | |
| 10 | | | | | | | 9.4 to 10.0 feet: NO RECOVERY. |

Total Depth = 10.0 feet bgs

**NOTES:**

1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

**Borehole Abandonment Details**
0 to 10.0 feet: 2.25-inch borehole.
0 to 10.0 feet: Bentonite chips hydrated with potable water.

▽ Soil becomes wet at 5.5 feet bgs as observed in core sample.

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTWPROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **PH-DP-1** | **1 of 1** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/12/23 to 4/12/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **5.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Percent Recovery | Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 1 | ▽ | | | | | | 0.0 to 0.2 feet: SILTY SAND (SM); brown; 40% fines, low plasticity; 60% sand, fine; 60% organic material (rootlets); loose; no odor; dry. |
| | | | | | | | 0.2 to 1.2 feet: Red brick; dry. |
| 2 | | | | **PH-DP-1-SB-1.5** | **0.0** | | 1.2 to 2.3 feet: SANDY GRAVEL (GW); blackish brown; 40% sand, fine to coarse; 60% gravel, fine to coarse, subangular to subrounded; loose; no odor; wet. |
| | | **58** | | | | | 2.3 to 2.9 feet: GRAVELLY SAND (SW); grayish brown; 70% sand, fine to coarse; 30% gravel, fine to coarse, subrounded; loose; no odor; wet. |
| 3 | | | | | **0.0** | | 2.9 to 5.0 feet: NO RECOVERY. |
| 4 | | | | | | | |
| 5 | | | | | | | |

*Total Depth = 5.0 feet bgs*

***NOTES:***

*1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.*

***Borehole Abandonment Details***
*0 to 5.0 feet: 2.25-inch borehole.*
*0 to 5.0 feet: Bentonite chips hydrated with potable water.*

▽ *Soil becomes wet at 1.2 feet bgs as observed in core sample.*

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **PH-DP-2** | **1 of 1** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/12/23 to 4/12/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **5.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Percent Recovery | Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 1 | ▽ | | | **PH-DP-2-SB-0.5** | **0.0** | | 0.0 to 1.4 feet: SILTY SAND (SM); blackish brown; 20% fines, low plasticity; 80% sand, fine to coarse; trace gravel, fine to coarse, subangular; loose; no odor; dry to moist.<br>@ 0.2 feet: White ceramic (insulator).<br>@ 0.8 to 1.1 feet: Red brick; weathered. |
| 2 | | **72** | | | **0.0** | | 1.4 to 2.7 feet: SILTY SAND (SM); grayish brown; 40% fines, low plasticity; 60% sand, fine to coarse; dense; no odor; trace iron mottling; wet.<br>@ 1.8 to 2.0 feet: Red brick; weathered.<br>@ 2.5 to 2.6 feet: Layer of coarse sand with gravel; gray.<br>@ 2.6 to 2.7 feet: Layer of black material with ceramic. |
| 3 | | | | | | | 2.7 to 3.6 feet: SILT WITH SAND (ML); brown; 70% fines, low plasticity; 30% sand, fine to coarse; soft; no odor; moist.<br>@ 3.5 feet: Red brick.<br>@ 3.6 feet: Layer of gray, brittle material. |
| 4 | | | | | | | 3.6 to 5.0 feet: NO RECOVERY. |
| 5 | | | | | | | |

Total Depth = 5.0 feet bgs

***NOTES:***

1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

***Borehole Abandonment Details***
0 to 5.0 feet: 2.25-inch borehole.
0 to 5.0 feet: Bentonite chips hydrated with potable water.

▽ Soil becomes wet at 1.4 feet bgs as observed in core sample.

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **PH-DP-3** | **1 of 1** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/12/23 to 4/12/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **5.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Percent Recovery | Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 1 | ▽ | | | **PH-DP-3-SB-0.8** | **0.0** | | 0.0 to 1.8 feet: SILTY SAND (SM); brown; 30% fines, low plasticity; 70% sand, fine to coarse; trace organic material (rootlets); loose; no odor; dry to wet.<br>@ 0.4 feet: Red brick.<br>@ 0.5 feet: Coal layer; thinly bedded.<br>@ 1.0 feet: Gray gravelly sand layer; becomes moist.<br>@ 1.3 feet: Becomes wet. |
| 2 | | **58** | | | **0.0** | | 1.8 to 2.7 feet: SANDY GRAVEL (GP); blackish brown; 30% sand, fine to coarse; 70% gravel, fine to medium, subangular; loose; no odor; wet. |
| 3 | | | | | | | 2.7 to 2.9 feet: SILTY SAND (SM); 40% fines, low plasticity; 60% sand, fine; 60% organic material (wood, rootlets); loose; no odor; wet.<br>2.9 to 5.0 feet: NO RECOVERY. |
| 4 | | | | | | | |
| 5 | | | | | | | |

Total Depth = 5.0 feet bgs

***NOTES:***

1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

***Borehole Abandonment Details***
0 to 5.0 feet: 2.25-inch borehole.
0 to 5.0 feet: Bentonite chips hydrated with potable water.

▽ Soil becomes wet at 1.3 feet bgs as observed in core sample.

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

# Geologic Borehole Log

MAUL FOSTER ALONGI

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **PH-DP-4** | **1 of 2** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/12/23 to 4/12/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **15.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Percent Recovery | Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 1 | | | | **PH-DP-4-SB-0.5** | **0.0** | | 0.0 to 0.8 feet: SILTY SAND WITH GRAVEL (SM); dark brown; 30% fines, low plasticity; 60% sand, fine to coarse; 10% gravel, fine, subangular; trace organic material (rootlets); loose; dry. |
| | | | | | | | @ 0.7 feet: Red brick fragments. |
| | | | | | | | 0.8 to 3.0 feet: SANDY GRAVEL WITH SILT (GP-GM); blackish brown; 10% fines, low plasticity; 40% sand, fine to coarse; 50% gravel, fine to medium, subangular; loose; coal throughout; no odor; moist to wet. |
| 2 | ▽ | | | | **0.0** | | @ 1.7 feet: Becomes wet. |
| 3 | | **66** | | **PH-DP-40-SB-2.5** | **0.0** | | |
| | ▼ | | | | | | 3.0 to 3.3 feet: SILTY SAND (SM); dark brown; 20% fines, low plasticity; 80% sand, fine to coarse; trace gravel; loose; no odor; wet. |
| 4 | | | | | | | 3.3 to 5.0 feet: NO RECOVERY. |
| 5 | | | | | | | |
| 6 | | | | | | | 5.0 to 6.0 feet: SILT WITH SAND (ML); orangish brown; 80% fines, medium plasticity; 20% sand, fine to coarse; stiff; no odor; moist. |
| | | | | | **0.0** | | 6.0 to 8.0 feet: SILTY SAND (SM); brown; 40% fines, low plasticity; 60% sand, fine to coarse; loose; no odor; wet. |
| 7 | | | | | | | @ 7.2 to 7.4 feet: Gray silt layer with orange mottling. |
| 8 | | **60** | | | **0.0** | | |
| | | | | | | | 8.0 to 10.0 feet: NO RECOVERY. |
| 9 | | | | | | | |
| 10 | | | | | | | |
| | | | | **PH-DP-4-GW-10.0** | | | 10.0 to 14.0 feet: SILTY SAND (SM); gray; 40% fines, low plasticity; 60% sand, fine to coarse; medium dense; orange mottling throughout; no odor; wet. |
| 11 | | | | | **0.0** | | @ 11.0 to 11.5 feet: Becomes loose. |
| | | | | | | | @ 11.5 feet: Becomes dense. |
| 12 | | **80** | | | | | |
| 13 | | | | | | | @ 13.0 to 13.5 feet: Dark brown and black lamina; no odor. |
| | | | | | **0.0** | | |
| 14 | | | | | | | |

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **PH-DP-4** | **2 of 2** |

| Depth (feet, bgs) | Water Levels | Sample Data: Percent Recovery | Sample Data: Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 15 | | 80 | | | | | 14.0 to 15.0 feet: NO RECOVERY. |

Total Depth = 15.0 feet bgs

***NOTES:***

*1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.*

***Reconnaissance Well Completion Details***
*Temporary slotted polyvinyl chloride well screen with a stainless steel mesh screen prepacked with 20/40 grade environmental sand set from 5.0 to 15.0 feet bgs.*

***Borehole Abandonment Details***
*0 to 15.0 feet: 2.25-inch borehole.*
*0 to 15.0 feet: Bentonite chips hydrated with potable water.*

▽ *Soil becomes wet at 1.7 feet bgs as observed in core sample.* ▼ *Water level measured is 3.40 feet bgs, following temporary well installation.*

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **PH-DP-5** | **1 of 1** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/12/23 to 4/12/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **5.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Percent Recovery | Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 1 | ▽ | | | **PH-DP-5-SB-0.8**<br>**PH-DP-5-SB-0.8-DP** | **0.0** | | 0.0 to 2.0 feet: SILTY SAND (SM); blackish brown; 40% fines, low plasticity; 60% sand, fine to coarse; dense; no odor; mosit to wet.<br>@ 0.15 to 0.3 feet: Red brick.<br>@ 0.4 feet: Layer of gravel; wet.<br>@ 0.7 feet: Becomes very dense.<br>@ 1.3 feet: Red brick.<br>@ 1.6 feet: Lamina of gravelly sand; gray. |
| 2 | | **54** | | | **0.0** | | 2.0 to 2.7 feet: SANDY SILT (ML); brown; 60% fines, low plasticity; 40% sand, fine to coarse; dense; no odor; moist. |
| 3 | | | | | | | 2.7 to 5.0 feet: NO RECOVERY. |
| 4 | | | | | | | |
| 5 | | | | | | | |

*Total Depth = 5.0 feet bgs*

***NOTES:***

*1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.*

***Borehole Abandonment Details***
*0 to 5.0 feet: 2.25-inch borehole.*
*0 to 5.0 feet: Bentonite chips hydrated with potable water.*

▽ *Soil becomes wet at 0.4 feet bgs as observed in core sample.*

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **SP-DP-1** | **1 of 1** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/11/23 to 4/11/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **5.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Sample Data: Percent Recovery | Screen Int. | Sample ID | PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 1 | | | | **SP-DP-1-SB-0.5** | **0.0** | | 0.0 to 3.2 feet: SILT WITH SAND (ML); brown; 70% fines, medium plasticity; 30% sand, fine to medium; trace organic material (rootlets); soft; trace iron mottling; no odor; moist. |
| 2 | | **64** | | | **0.0** | | |
| 3 | ▽ | | | | | | @ 3.1 feet: Becomes wet. |
| 4 | | | | | | | 3.2 to 5.0 feet: NO RECOVERY. |
| 5 | | | | | | | |

Total Depth = 5.0 feet bgs

***NOTES:***

*1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.*

***Borehole Abandonment Details***
*0 to 5.0 feet: 2.25-inch borehole.*
*0 to 5.0 feet: Bentonite chips hydrated with potable water.*

▽ *Soil becomes wet at 3.1 feet bgs as observed in core sample.*

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

# Geologic Borehole Log

MAUL FOSTER ALONGI

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **SP-DP-2** | **1 of 2** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/11/23 to 4/11/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **19.5 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Sample Data: Percent Recovery | Screen Int. | Sample ID | PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 0 | | | | | | | 0.0 to 0.8 feet: SILTY SAND WITH GRAVEL (SM); dark brown; 40% fines, low plasticity; 50% sand, fine to coarse; 10% gravel, subangular to subrounded; trace organic material (rootlets, wood); medium dense; no odor; moist. |
| 1 | | | | **SP-DP-2-SB-0.5** | **0.0** | | |
| | | | | **SP-DP-2-SB-0.5-DUP** | **0.0** | | 0.8 to 2.6 feet: SILTY SAND (SM); dark brown; 40% fines, low plasticity; 60% sand, fine to coarse; trace gravel, subangular to subrounded; trace organic material (rootlets, wood); medium dense; no odor; moist.<br>@ 0.8 to 1.1 feet: Black burnt wood fragments; no odor.<br>@ 1.3 feet: Trace iron mottling. |
| 2 | | | | | | | |
| 3 | ▼ | **52** | | | **0.0** | | 2.6 to 5.0 feet: NO RECOVERY. |
| 4 | | | | | | | |
| 5 | | | | | | | 5.0 to 7.7 feet: SAND WITH SILT (SP-SM); light brown; 10% fines, low plasticity; 90% sand, fine to medium; medium dense; no odor; dry.<br>@ 5.4 to 5.7 feet: Black burnt wood fragments; no odor. |
| 6 | | | | | **0.0** | | @ 5.9 feet: Coarse gravel; gray.<br>@ 6.0 feet: Becomes very dense. |
| 7 | | | | | **0.0** | | @ 7.0 feet: Color changes to orangish brown. |
| 8 | | **54** | | | | | 7.7 to 10.0 feet: NO RECOVERY. |
| 9 | | | | | | | |
| 10 | | | | | | | 10.0 to 11.5 feet: SILTY SAND (SM); orangish brown; 35% fines, low plasticity; 65% sand, fine to coarse; very dense; no odor; moist. |
| 11 | | | | | | | @ 11.0 feet: Black burnt wood fragments; no odor. |
| 12 | | | | | **0.0** | | 11.5 to 16.5 feet: SAND WITH SILT (SP-SM); light brown; 10% fines, low plasticity; 90% sand, fine; very dense; no odor; dry. |
| 13 | | **100** | | | | | |
| 14 | | | | | | | |
| 15 | | | | | **0.0** | | |

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **SP-DP-2** | **2 of 2** |

| Depth (feet, bgs) | Water Levels | Percent Recovery | Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 16 | | | | **SP-DP-2-GW-15.0**<br>**SP-DP-2-GW-15.0-DUP** | | | |
| 17 | | **100** | | | | | *16.5 to 18.4 feet: SANDY SILT (ML); light brown; 60% fines, nonplastic; 40% sand, fine; very stiff; no odor; dry.*<br>*@ 17.4 feet: Color changes to grayish brown; no odor.* |
| 18 | ▽ | | | | | | *@ 18.3 feet: Color changes to gray; no odor.*<br>*18.4 to 18.5 feet: SILTY SAND (SM); gray; 40% fines, low plasticity; 60% sand, fine to coarse; medium dense; no odor; wet.*<br>*@ 18.5 feet: Refusal. Advanced well point to approximately 20 feet bgs.* |
| 19 | | | | | | | |

*Total Depth = 19.5 feet bgs*

***NOTES:***

*1) Refusal encountered at 18.5 feet bgs. Advanced well point to approximately 20 feet bgs without core retrieval. 2) bgs = below ground surface. 3) Depths are relative to feet bgs. 4) ID = identification. 5) PID = photoionization detector. 5) ppm = parts per million.*

***Reconnaissance Well Completion Details***
*Temporary slotted polyvinyl chloride well screen with a stainless steel mesh screen prepacked with 20/40 grade environmental sand set from 9.0 to 19.5 feet bgs.*

***Borehole Abandonment Details***
*0 to 19.5 feet: 2.25-inch borehole.*
*0 to 19.5 feet: Bentonite chips hydrated with potable water.*

▽ *Soil becomes wet at 18.4 feet bgs as observed in core sample.* ▼ *Water level measured is 2.75 feet bgs, following temporary well installation.*

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **SP-DP-3** | **1 of 2** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/11/23 to 4/11/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **15.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Sample Data: Percent Recovery | Screen Int. | Sample ID | PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 0 | | | | | | | 0.0 to 3.2 feet: SILTY SAND (SM); dark brown; 40% fines, low plasticity; 60% sand, fine to coarse; trace organic material (rootlets); loose; no odor; moist. |
| 1 | | | | **SP-DP-3-SB-0.5** | **0.0** | | @ 1.0 to 1.2 feet: Black coal fragments.<br>@ 1.0 to 1.5 feet: White ceramic fragments. |
| 2 | | | | | | | @ 2.0 feet: Becomes medium dense; color changes to orangish brown. |
| 3 | | **64** | | **SP-DP-3-SB-2.5** | **0.0** | | |
| 4 | | | | | | | 3.2 to 5.0 feet: NO RECOVERY. |
| 5 | | | | | | | 5.0 to 8.0 feet: SILTY SAND (SM); brown; 40% fines, low plasticity; 60% sand, fine to coarse; loose; no odor; moist. |
| 6 | | | | | | | |
| 7 | | | | | | | @ 7.0 feet: Black spotting; no odor.<br>@ 7.2 feet: Color changes to orangish brown. |
| 8 | ▽ | **70** | | | **0.0** | | 8.0 to 8.5 feet: SANDY SILT (ML); gray; 50% fines, medium plasticity; 50% sand, fine to coarse; loose; no odor; wet. |
| 9 | | | | | | | 8.5 to 10.0 feet: NO RECOVERY. |
| 10 | | | | | | | 10.0 to 12.6 feet: SANDY SILT (ML); gray; 50% fines, medium plasticity; 50% sand, fine to coarse; loose; no odor; wet. |
| 11 | | | | | | | |
| 12 | | **100** | | | | | |
| 13 | | | | | | | 12.6 to 13.2 feet: WOODY DEBRIS; black; no odor. |
| 14 | | | | | | | 13.2 to 15.0 feet: SILTY SAND (SM); gray; 40% fines, medium plasticity; 60% sand, fine to coarse; loose; no odor; wet. |

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **SP-DP-3** | **2 of 2** |

| Depth (feet, bgs) | Water Levels | Sample Data: Percent Recovery | Sample Data: Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 15 | | **100** | | | **0.0** | | |

*Total Depth = 15.0 feet bgs*

***NOTES:***

*1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.*

***Borehole Abandonment Details***
*0 to 15.0 feet: 2.25-inch borehole.*
*0 to 15.0 feet: Bentonite chips hydrated with potable water.*

▽ *Soil becomes wet at 8.0 feet bgs as observed in core sample.*

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

# Geologic Borehole Log

MAUL FOSTER ALONGI

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **TA-DP-1** | **1 of 2** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/12/23 to 4/12/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **15.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Sample Data: Percent Recovery | Sample Data: Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 1 | ▽ | | | | 0.0 | | 0.0 to 0.5 feet: SILTY SAND (SM); blackish brown; 30% fines, low plasticity; 70% sand, fine to coarse; loose; trace coal; no odor; dry. |
| 2 | | | | | | | 0.5 to 3.0 feet: SANDY GRAVEL (GP); blackish brown; 30% sand, fine to coarse; 70% gravel, fine to medium, subangular; loose; no odor; wet. |
| 3 | ▼ | 60 | | | 0.0 | | @ 2.8 to 3.0 feet: Pulverized rock. |
| 4 | | | | | | | 3.0 to 5.0 feet: NO RECOVERY. |
| 5 | | | | | | | |
| 6 | | | | | | | 5.0 to 7.8 feet: SILTY SAND (SM); gray and brown; 40% fines, low plasticity; 60% sand, fine to coarse; very dense; no odor; moist. |
| 7 | | | | | 0.0 | | |
| 8 | | 56 | | | | | 7.8 to 10.0 feet: NO RECOVERY. |
| 9 | | | | | | | |
| 10 | | | | TA-DP-1-GW-10.0 | | | 10.0 to 13.8 feet: SILT WITH SAND (ML); grayish brown; 70% fines, low plasticity; 30% sand, fine to coarse; stiff; no odor; wet. |
| 11 | | | | | 0.0 | | |
| 12 | | 76 | | | | | @ 11.2 feet: Interbedded silty sand. |
| 13 | | | | | | | @ 13.3 feet: Interbedded silty sand. |
| 14 | | | | | | | 13.8 to 15.0 feet: NO RECOVERY. |

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **TA-DP-1** | **2 of 2** |

| Depth (feet, bgs) | Water Levels | Sample Data: Percent Recovery | Sample Data: Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 15 | | 76 | | | | | |

*Total Depth = 15.0 feet bgs*

***NOTES:***

*1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.*

***Reconnaissance Well Completion Details***
*Temporary slotted polyvinyl chloride well screen with a stainless steel mesh screen prepacked with 20/40 grade environmental sand set from 5.0 to 15.0 feet bgs.*

***Borehole Abandonment Details***
*0 to 15.0 feet: 2.25-inch borehole.*
*0 to 15.0 feet: Bentonite chips hydrated with potable water.*

*▽ Soil becomes wet at 0.5 and 10.0 feet bgs as observed in core sample. ▼ Water level measured is 2.70 feet bgs, following temporary well installation.*

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **TF-DP-1** | **1 of 1** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/12/23 to 4/12/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **5.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Percent Recovery | Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 1 | | | | | **0.0** | | *0.0 to 1.4 feet: SILTY SAND (SM); blackish brown; 20% fines, low plasticity; 80% sand, fine to coarse; trace organic material (rootlets); loose; no odor; dry.* |
| | | | | **TF-DP-1-SB-1.0** | **0.0** | | *@ 0.3 to 0.5 feet: Gray concrete.* |
| | | | | | | | *@ 0.6 to 0.7 feet: Color changes to black; no odor.* |
| | | | | | | | *@ 0.8 to 1.1 feet: Color changes to brown.* |
| 2 | | | | | | | *1.4 to 2.6 feet: CONCRETE; gray; pulverized; dry.* |
| | ▽ | **82** | | | | | *2.6 to 4.1 feet: SILTY SAND (SM); brown; 40% fines, low plasticity; 60% sand, fine to medium; medium dense; no odor; wet.* |
| 3 | | | | **TF-DP-1-SB-3.0** | **0.0** | | *@ 2.9 to 3.0 feet: Color changes to black; no odor.* |
| | | | | | **0.0** | | |
| 4 | | | | | | | *4.1 to 5.0 feet: NO RECOVERY.* |
| 5 | | | | | | | |

*Total Depth = 5.0 feet bgs*

***NOTES:***

*1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.*

***Borehole Abandonment Details***
*0 to 5.0 feet: 2.25-inch borehole.*
*0 to 5.0 feet: Bentonite chips hydrated with potable water.*

▽ *Soil becomes wet at 2.6 feet bgs as observed in core sample.*

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **TF-DP-2** | **1 of 1** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/12/23 to 4/12/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **5.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Percent Recovery | Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 1 | ▽ | | | **TF-DP-2-SB-0.5** | **0.0** | | 0.0 to 1.7 feet: SILTY SAND (SM); blackish brown; 40% fines, low plasticity; 60% sand, fine to coarse; loose; no odor; dry. |
| 2 | | **66** | | **TF-DP-2-SB-2.5** | **0.0** | | @ 1.35 to 1.65 feet: Red brick. |
| 3 | | | | | | | 1.7 to 3.3 feet: SANDY GRAVEL (GW); dark brown; 30% sand, fine to coarse; 70% gravel, fine to coarse, subangular; loose; trace coal; no odor; wet. |
| 4 | | | | | | | 3.3 to 5.0 feet: NO RECOVERY. |
| 5 | | | | | | | |

Total Depth = 5.0 feet bgs

***NOTES:***

*1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.*

***Borehole Abandonment Details***
*0 to 5.0 feet: 2.25-inch borehole.*
*0 to 5.0 feet: Bentonite chips hydrated with potable water.*

▽ *Soil becomes wet at 1.7 feet bgs as observed in core sample.*

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **VM-DP-1** | **1 of 1** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/12/23 to 4/12/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **5.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Percent Recovery | Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 1 | | | | **VM-DP-1-SB-0.5** | **0.0** | | 0.0 to 1.5 feet: SILTY SAND WITH GRAVEL (SM); black; 40% fines, low plasticity; 50% sand, fine to coarse; 10% gravel, fine, subangular; trace organic material (rootlets); loose; trace coal; trace red brick fragments; no odor; moist. |
| 2 | ▽ | **56** | | | **0.0** | | 1.5 to 2.8 feet: SILTY SAND (SM); brown; 40% fines, low plasticity; 60% sand, fine to coarse; medium dense; no odor; moist to wet.<br>@ 2.4 feet: Becomes wet. |
| 3 | | | | | | | 2.8 to 5.0 feet: NO RECOVERY. |
| 4 | | | | | | | |
| 5 | | | | | | | |

Total Depth = 5.0 feet bgs

**NOTES:**

1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

**Borehole Abandonment Details**
0 to 5.0 feet: 2.25-inch borehole.
0 to 5.0 feet: Bentonite chips hydrated with potable water.

▽ Soil becomes wet at 2.4 feet bgs as observed in core sample.

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **VM-DP-2** | **1 of 1** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/12/23 to 4/12/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **5.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Percent Recovery | Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 1 | | | | **VM-DP-2-SB-0.5** | **0.0** | | *0.0 to 3.7 feet: SILTY SAND (SM); black; 40% fines, low plasticity; 60% sand, fine to coarse; trace organic material (rootlets); loose; no odor; moist to wet.* |
| 2 | ▽ | **74** | | | **0.0** | | *@ 1.2 to 1.35 feet: Red brick, weathered.* *@ 1.5 feet: Color changes to brown.* *@ 2.1 feet: Becomes wet.* |
| 3 | | | | | **0.0** | | *@ 2.9 to 3.6 feet: Interbedded medium sand lamina.* |
| 4 | | | | | | | *3.7 to 5.0 feet: NO RECOVERY.* |
| 5 | | | | | | | |

*Total Depth = 5.0 feet bgs*

***NOTES:***

*1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.*

***Borehole Abandonment Details***
*0 to 5.0 feet: 2.25-inch borehole.*
*0 to 5.0 feet: Bentonite chips hydrated with potable water.*

▽ *Soil becomes wet at 2.1 feet bgs as observed in core sample.*

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **VM-DP-3** | **1 of 1** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/12/23 to 4/12/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **5.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Percent Recovery | Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 1 | | | | **VM-DP-3-SB-0.5** | **0.0** | | 0.0 to 3.0 feet: SILTY SAND (SM); black; 40% fines, low plasticity; 60% sand, fine to coarse; trace organic material (rootlets); loose; no odor; moist to wet.<br>@ 0.8 to 0.9 feet: Red brick, weathered.<br>@ 1.0 feet: Color changes to brown. |
| 2 | ▽ | **60** | | | | | @ 2.0 feet: Becomes wet. |
| 3 | | | | **VM-DP-3-SB-2.5** | **0.0** | | 3.0 to 5.0 feet: NO RECOVERY. |
| 4 | | | | | | | |
| 5 | | | | | | | |

Total Depth = 5.0 feet bgs

***NOTES:***

1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

***Borehole Abandonment Details***
0 to 5.0 feet: 2.25-inch borehole.
0 to 5.0 feet: Bentonite chips hydrated with potable water.

▽ Soil becomes wet at 2.0 feet bgs as observed in core sample.

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **VM-DP-4** | **1 of 1** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/11/23 to 4/11/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **5.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Percent Recovery | Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 1 | ▽ | 64 | | VM-DP-4-SB-0.5 | 0.0 | | 0.0 to 3.2 feet: SILTY SAND (SM); black; 40% fines, low plasticity; 60% sand, fine to coarse; trace organic material (rootlets); loose; moist. |
| 2 | | | | | | | @ 1.3 feet: Color changes to brown; becomes wet. |
| 3 | | | | | 0.0 | | |
| 4 | | | | | | | 3.2 to 5.0 feet: NO RECOVERY. |
| 5 | | | | | | | |

Total Depth = 5.0 feet bgs

**NOTES:**

1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

**Borehole Abandonment Details**
0 to 5.0 feet: 2.25-inch borehole.
0 to 5.0 feet: Bentonite chips hydrated with potable water.

▽ Soil becomes wet at 1.3 feet bgs as observed in core sample.

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

# Geologic Borehole Log

MAUL FOSTER ALONGI

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **WL-DP-1** | **1 of 1** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/12/23 to 4/12/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **10.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Percent Recovery | Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 1 | | | | **WL-DP-1-SB-0.5** | **0.0** | | 0.0 to 1.1 feet: SILTY SAND (SM); gray; 40% fines, low plasticity; 60% sand, fine to coarse; loose; no odor; moist. |
| 2 | | | | | | | 1.1 to 2.8 feet: CONCRETE; light gray; pulverized; dry. |
| 3 | | **56** | | | | | 2.8 to 5.0 feet: NO RECOVERY. |
| 4 | | | | | | | |
| 5 | | | | | | | 5.0 to 7.5 feet: CONCRETE; light gray; pulverized; dry. |
| 6 | | | | | | | |
| 7 | ▽ | **64** | | | | | @ 7.4 feet: Becomes wet. |
| 8 | | | | | **0.0** | | 7.5 to 7.7 feet: SANDY SILT (ML); blackish brown; 70% fines, low plasticity; 30% sand, fine; 60% organic material (wood, rootlets); no odor; wet.<br>7.7 to 8.2 feet: SILTY SAND (SM); grayish brown; 40% fines, low plasticity; 60% sand, fine to coarse; dense; no odor; wet. |
| 9 | | | | | | | 8.2 to 10.0 feet: NO RECOVERY. |
| 10 | | | | | | | |

Total Depth = 10.0 feet bgs

**NOTES:**

1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

**Borehole Abandonment Details**
0 to 10.0 feet: 2.25-inch borehole.
0 to 10.0 feet: Bentonite chips hydrated with potable water.

▽ Soil becomes wet at 7.4 feet bgs as observed in core sample.

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTWPROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **WL-DP-2** | **1 of 2** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/12/23 to 4/12/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **15.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Percent Recovery | Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 1 | | | | **WL-DP-2-SB-0.3** | **0.0** | | 0.0 to 0.4 feet: SILTY SAND (SM); blackish brown; 30% fines, low plasticity; 70% sand, fine; 40% organic material (wood, rootlets); loose; no odor; moist. |
| | | | | | | | 0.4 to 2.0 feet: CONCRETE; light gray; pulverized; dry. |
| | | | | | | | @ 0.6 to 1.0 feet: Moist. |
| 2 | | | | | | | @ 1.4 to 1.5 feet: Moist. |
| | | **40** | | | | | 2.0 to 5.0 feet: NO RECOVERY. |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| | | | | | | | 5.0 to 7.4 feet: CONCRETE; light gray; pulverized; dry. |
| 6 | | | | | | | |
| | | | | | | | @ 6.4 feet: Becomes moist. |
| 7 | | | | | | | |
| | | **48** | | | | | 7.4 to 10.0 feet: NO RECOVERY. |
| 8 | | | | | | | |
| 9 | | | | | | | |
| 10 | ▽ | | | | | | |
| | | | | | | | 10.0 to 10.5 feet: CONCRETE; dark gray; pulverized; wet. |
| | | | | | **0.0** | | 10.5 to 11.0 feet: SANDY SILT (ML); blackish brown; 60% fines, low plasticity; 40% sand, fine to coarse; 20% organic material (wood, rootlets); soft; no odor; wet. |
| 11 | | | | | | | 11.0 to 13.5 feet: SILTY SAND (SM); gray and brown; 40% fines, low plasticity; 60% sand, fine to medium; dense; trace iron mottling; no odor; moist. |
| 12 | | **70** | | | | | |
| 13 | | | | | **0.0** | | |
| | | | | | | | 13.5 to 15.0 feet: NO RECOVERY. |
| 14 | | | | | | | |

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **WL-DP-2** | **2 of 2** |

| Depth (feet, bgs) | Water Levels | Sample Data: Percent Recovery | Sample Data: Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 15 | | **70** | | | | | |

*Total Depth = 15.0 feet bgs*

***NOTES:***

*1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.*

***Borehole Abandonment Details***
*0 to 15.0 feet: 2.25-inch borehole.*
*0 to 15.0 feet: Bentonite chips hydrated with potable water.*

▽ *Soil becomes wet at 10.0 feet bgs as observed in core sample.*

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

# Geologic Borehole Log

MAUL FOSTER ALONGI

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **WL-DP-3** | **1 of 1** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/12/23 to 4/12/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **10.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Sample Data: Percent Recovery | Sample Data: Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 1 | | | | **WL-DP-3-SB-0.5** | **0.0** | | 0.0 to 2.6 feet: PULVERIZED ROCK; dark gray; slate like; dry. |
| 2 | | | | | **0.0** | | |
| 3 | | **52** | | | | | 2.6 to 5.0 feet: NO RECOVERY. |
| 4 | | | | | | | |
| 5 | ▽ | | | | | | 5.0 to 5.3 feet: PULVERIZED ROCK; dark gray; slate like; wet. |
| | | | | | | | 5.3 to 5.8 feet: SANDY SILT (ML); blackish brown; 60% fines, medium plasticity; 40% sand, fine to coarse; 40% organic material (wood); no odor; wet. |
| 6 | | | | | | | 5.8 to 7.3 feet: SILTY SAND (SM); gray and brown; 40% fines, low plasticity; 60% sand, fine; dense; trace iron mottling; no odor; moist. |
| 7 | | | | | **0.0** | | |
| | | **52** | | | | | 7.3 to 7.6 feet: SANDY SILT (ML); 70% fines, low plasticity; 30% sand, fine; soft; no odor; moist. |
| 8 | | | | | | | 7.6 to 10.0 feet: NO RECOVERY. |
| 9 | | | | | | | |
| 10 | | | | | | | |

Total Depth = 10.0 feet bgs

**NOTES:**

1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

**Borehole Abandonment Details**
0 to 10.0 feet: 2.25-inch borehole.
0 to 10.0 feet: Bentonite chips hydrated with potable water.

▽ Soil becomes wet at 5.0 feet bgs as observed in core sample.

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

MAUL FOSTER ALONGI

# Geologic Borehole Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| **M1122.05.003** | **WL-DP-4** | **1 of 1** |

| | | | |
|---|---|---|---|
| Project Name | **Forterra Roslyn #4 Mine** | | |
| Project Location | **205 E Dakota Avenue, Roslyn, WA** | Surface Elevation (feet) | |
| Start/End Date | **4/12/23 to 4/12/23** | Northing | |
| Driller/Equipment | **Anderson Environmental Contracting LLC/Direct Push** | Easting | |
| Geologist/Engineer | **A. Bixby** | Total Depth of Borehole | **5.0 feet** |
| Sample Method | **Core Barrel** | Outer Hole Diam | **2.25 inch** |

| Depth (feet, bgs) | Water Levels | Percent Recovery | Screen Int. | Sample Data: Sample ID | Sample Data: PID (ppm) | Lithologic Column | Soil Description |
|---|---|---|---|---|---|---|---|
| 1 | | | | **WL-DP-4-SB-0.5** | **0.0** | | 0.0 to 1.4 feet: SILTY SAND (SM); dark brown; 30% fines, low plasticity; 70% sand, fine to coarse; trace organic material (rootlets); loose; no odor; dry. |
| | | | | | | | @ 1.1 to 1.4 feet: Gradually coarsens to gravelly sand. |
| 2 | ▽ | | | | | | 1.4 to 2.0 feet: SANDY GRAVEL WITH SILT (GP-GM); orangish brown; 10% fines, low plasticity; 30% sand, fine to coarse; 60% gravel, fine to medium, subangular; loose; no odor; moist. |
| | | **84** | | | | | 2.0 to 3.6 feet: WOODY DEBRIS; brown; wet. |
| 3 | | | | | | | |
| 4 | | | | | **0.0** | | 3.6 to 4.2 feet: SILT WITH SAND (ML); gray and brown; 70% fines, low plasticity; 30% sand, fine to coarse; firm; trace iron mottling; no odor; moist. |
| | | | | | | | 4.2 to 5.0 feet: NO RECOVERY. |
| 5 | | | | | | | |

Total Depth = 5.0 feet bgs

***NOTES:***

*1) bgs = below ground surface. 2) Depths are relative to feet bgs. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.*

***Borehole Abandonment Details***
*0 to 5.0 feet: 2.25-inch borehole.*
*0 to 5.0 feet: Bentonite chips hydrated with potable water.*

▽ *Soil becomes wet at 2.0 feet bgs as observed in core sample.*

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\1122.05\M1122.05.003 ROSLYN #4 MINE.GPJ 05/04/23

# APPENDIX C

## FIELD SAMPLING DATA SHEETS

# Maul Foster & Alongi, Inc.

109 East 13th Street, Vancouver, WA 98660 (360) 694-2691 Fax. (360) 906-1

## Water Field Sampling Data Sheet

| | | | |
|---|---|---|---|
| **Client Name** | Forterra | **Sample Location** | PH-DP-4 |
| **Project #** | M1122.05.003 | **Sampler** | A. Bixby |
| **Project Name** | Roslyn #4 Mine | **Sampling Date** | 4/12/2023 |
| **Sampling Event** | March 2023 | **Sample Name** | PH-DP-4-GW-10.0 |
| **Sub Area** | | **Sample Depth** | 10 |
| **FSDS QA:** | A. Bixby 4/27/2023 | **Easting** | **Northing** | **TOC** |

### Hydrology/Level Measurements

| | | | | | (Product Thickness) | (Water Column) | (Gallons/ft x Water Column) |
|---|---|---|---|---|---|---|---|
| **Date** | **Time** | **DT-Bottom** | **DT-Product** | **DT-Water** | **DTP-DTW** | **DTB-DTW** | **Pore Volume** |
| 4/12/2023 | 10:50 | 14.78 | | 3.4 | | 11.38 | 0.26 |

(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** | **Time** | **Purge Vol (gal)** | **Flowrate l/min** | **pH** | **Temp (C)** | **E Cond (uS/cm)** | **DO (mg/L)** | **ORP** | **Turbidity** |
|---|---|---|---|---|---|---|---|---|---|
| (2) Peristaltic Pump | 12:30:00 PM | 7 | 0.3 | | | | | | 623 |
| | 12:56:00 PM | 9 | 0.3 | | | | | | 141 |
| | 1:25:00 PM | 10 | 0.3 | 6.93 | 10.9 | 380 | | | 165 |
| | 1:30:00 PM | 10.2 | 0.3 | 6.88 | 8.8 | 370 | | | 263 |
| | 1:35:00 PM | 10.4 | 0.3 | 6.9 | 7.8 | 380 | | | 241 |
| | 1:40:00 PM | 10.6 | 0.3 | 6.91 | 7.7 | 380 | | | 268 |
| Final Field Parameters | 1:45:00 PM | 10.8 | 0.3 | 6.92 | 7.8 | 370 | | | 253 |

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

**Water Quality Observations:** Cloudy; brown tint; no odor; no sheen.

### Sample Information

| **Sampling Method** | **Sample Type** | **Sampling Time** | **Container Code/Preservative** | **#** | **Filtered** |
|---|---|---|---|---|---|
| (2) Peristaltic Pump | Groundwater | 2:00:00 PM | VOA-Glass | | |
| | | | Amber Glass | 1 | No |
| | | | White Poly | | |
| | | | Yellow Poly | | |
| | | | Green Poly | | |
| | | | Red Total Poly | 1 | No |
| | | | Red Dissolved Poly | 1 | Yes |
| | | | Total Bottles | 3 | |

**General Sampling Comments** Began purging at 11:00 AM.

# Maul Foster & Alongi, Inc.

109 East 13th Street, Vancouver, WA 98660 (360) 694-2691 Fax. (360) 906-1

## Water Field Sampling Data Sheet

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Client Name** | Forterra | **Sample Location** | SP-DP-2 | | | | |
| **Project #** | M1122.05.003 | **Sampler** | A. Bixby | | | | |
| **Project Name** | Roslyn #4 Mine | **Sampling Date** | 4/12/2023 | | | | |
| **Sampling Event** | March 2023 | **Sample Name** | SP-DP-2-GW-15.0 | | | | |
| **Sub Area** | | **Sample Depth** | 15 | | | | |
| **FSDS QA:** | A. Bixby 4/27/2023 | **Easting** | | **Northing** | | **TOC** | |

### Hydrology/Level Measurements

| | | | | | (Product Thickness) | (Water Column) | (Gallons/ft x Water Column) |
|---|---|---|---|---|---|---|---|
| **Date** | **Time** | **DT-Bottom** | **DT-Product** | **DT-Water** | **DTP-DTW** | **DTB-DTW** | **Pore Volume** |
| 4/11/2023 | 12:09 | 19.51 | | 2.75 | | 16.76 | 0.39 |

(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** | **Time** | **Purge Vol (gal)** | **Flowrate l/min** | **pH** | **Temp (C)** | **E Cond (uS/cm)** | **DO (mg/L)** | **ORP** | **Turbidity** |
|---|---|---|---|---|---|---|---|---|---|
| (2) Peristaltic Pump | 4:30:00 PM | 15 | 0.3 | | | | | | 700 |
| | 5:28:00 PM | 19 | 0.3 | 7.03 | 7.8 | 450 | | | 627 |
| | 5:33:00 PM | 19.1 | 0.3 | 7.03 | 7.3 | 450 | | | 748 |
| | 5:38:00 PM | 19.2 | 0.3 | 7.03 | 7.1 | 450 | | | 729 |
| | 7:45:00 AM | 19.3 | 0.3 | 6.9 | 5.4 | 430 | | | |
| | 7:50:00 AM | 19.4 | 0.3 | 6.9 | 5.6 | 430 | | | |
| Final Field Parameters | 7:55:00 AM | 19.5 | 0.3 | 6.91 | 5.7 | 440 | | | |

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

### Water Quality Observations:

Cloudy; brown tint; no odor; no sheen.

### Sample Information

| **Sampling Method** | **Sample Type** | **Sampling Time** | **Container Code/Preservative** | **#** | **Filtered** |
|---|---|---|---|---|---|
| (2) Peristaltic Pump | Groundwater | 8:00:00 AM | VOA-Glass | | |
| | | | Amber Glass | 3 | No |
| | | | White Poly | | |
| | | | Yellow Poly | | |
| | | | Green Poly | | |
| | | | Red Total Poly | 3 | No |
| | | | Red Dissolved Poly | 3 | Yes |
| | | | Total Bottles | 9 | |

### General Sampling Comments

Began purging at 12:30 PM on 4/11/23. Allowed to settle overnight.
Resumed purging at 7:35 AM on 4/12/23. Turbidity was overrange for all three readings on 4/12/23.
MS/MSD and field duplicate SP-DP-2-GW-15.0-DUP collected here.

# Maul Foster & Alongi, Inc.

109 East 13th Street, Vancouver, WA 98660 (360) 694-2691 Fax. (360) 906-1

## Water Field Sampling Data Sheet

| | | | |
|---|---|---|---|
| **Client Name** | Forterra | **Sample Location** | TA-DP-1 |
| **Project #** | M1122.05.003 | **Sampler** | A. Bixby |
| **Project Name** | Roslyn #4 Mine | **Sampling Date** | 4/13/2023 |
| **Sampling Event** | March 2023 | **Sample Name** | TA-DP-1-GW-10.0 |
| **Sub Area** | | **Sample Depth** | 10 |
| **FSDS QA:** | A. Bixby 4/27/2023 | **Easting** | **Northing** | **TOC** |

### Hydrology/Level Measurements

| | | | | | (Product Thickness) | (Water Column) | (Gallons/ft x Water Column) |
|---|---|---|---|---|---|---|---|
| **Date** | **Time** | **DT-Bottom** | **DT-Product** | **DT-Water** | **DTP-DTW** | **DTB-DTW** | **Pore Volume** |
| 4/13/2023 | 7:45 | 14.85 | | 2.7 | | 12.15 | 0.28 |

(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** | **Time** | **Purge Vol (gal)** | **Flowrate l/min** | **pH** | **Temp (C)** | **E Cond (uS/cm)** | **DO (mg/L)** | **ORP** | **Turbidity** |
|---|---|---|---|---|---|---|---|---|---|
| (2) Peristaltic Pump | 8:40:00 AM | 2.7 | 0.3 | | | | | | 159 |
| | 8:45:00 AM | 2.9 | 0.3 | 7.35 | 6.1 | 420 | | | 75 |
| | 8:50:00 AM | 3.1 | 0.3 | 7.36 | 6.2 | 400 | | | 45.4 |
| | 8:55:00 AM | 3.3 | 0.3 | 7.36 | 6.5 | 400 | | | 31.4 |
| | | | | | | | | | |
| | | | | | | | | | |
| Final Field Parameters | 9:00:00 AM | 3.5 | 0.3 | 7.36 | 6.5 | 400 | | | 21.8 |

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

### Water Quality Observations:

Cloudy, then clear; brown; no odor; no sheen.

### Sample Information

| **Sampling Method** | **Sample Type** | **Sampling Time** | **Container Code/Preservative** | **#** | **Filtered** |
|---|---|---|---|---|---|
| (2) Peristaltic Pump | Groundwater | 9:10:00 AM | VOA-Glass | | |
| | | | Amber Glass | 1 | No |
| | | | White Poly | | |
| | | | Yellow Poly | | |
| | | | Green Poly | | |
| | | | Red Total Poly | 1 | No |
| | | | Red Dissolved Poly | 1 | Yes |
| | | | Total Bottles | 3 | |

### General Sampling Comments

Began purging at 7:50 AM.

# APPENDIX D

## ARCHAEOLOGICAL MONITORING REPORT

# CULTURAL RESOURCES REPORT COVER SHEET

Author: Andrew Fleming, M.A.

Title of Report: **Archaeological Monitoring of Twenty-Three Geological Bores at the No. 4 Mine Residential Developmnt Project, Roslyn, Kittitas County, Washington**

Date of Report: April 20, 2023

County(ies): Kittitas Section: 17 Township: 20N Range: 15E

Quad: Cle Elum, WA Acres: 27 acres

PDF of report submitted (REQUIRED) ☒ Yes

Historic Property Inventory Forms to be Approved Online? ☐ Yes ☒ No

Archaeological Site(s)/Isolate(s) Found or Amended? ☐ Yes ☒ No

TCP(s) found? ☐ Yes ☒ No

Replace a draft? ☐ Yes ☒ No

Satisfy a DAHP Archaeological Excavation Permit requirement? ☐ Yes # ☒ No

Were Human Remains Found? ☐ Yes DAHP Case # ☒ No

DAHP Archaeological Site #:

45KT2784

_____

_____

_____

_____

_____

_____

# ARCHAEOLOGICAL MONITORING OF TWENTY-THREE GEOLOGICAL BORES AT THE NO. 4 MINE RESIDENTIAL DEVELOPMENT PROJECT, ROSLYN, KITTITAS COUNTY, WASHINGTON

April 20, 2023

RLR Report No. 2023-665-18

By

Andrew Fleming, M.A.



**RLR CULTURAL RESOURCES, LLC**
*409 N. Water Street, Ellensburg, WA 98926*
*Phone: (509) 952-5130, E-Mail: chris@rlrcultural.com*

Consultation Provided to:
Forterra | Land for Good
Seattle, Washington

# TABLE OF CONTENTS

Executive Summary .....1

Monitoring Results .....5

References Cited .....12

**List of Figures**

Figure 1. Project Area on Cle Elum, WA 7.5', 1:24,000 Topographic Quadrangle.....2
Figure 2. Project Area boundaries with Site 45KT2784 boundaries on Orthographic Map. .....3
Figure 3 Client Initial Concept Map of the Proposed project area (map courtesy of Forterra | Land for Good). .....4
Figure 4. Map of Boring Locations and Nearby Features (Data provided by Maul Foster & Alongi, Inc.).....6
Figure 5. PH-DP-4; View: N. .....10
Figure 6. PH-DP-4 Core Overview; Detail. .....10
Figure 7. White Ceramic recovered from SP-DP-3; Detail.....11

**List of Tables**

Table 1 Summary of April 2023 Tests .....7

# Executive Summary

RLR Cultural Resources, LLC (RLR) was contracted by Forterra - Land for Good to monitor 23 environmental assessment probes in 2023 at a 27-acre lot south of W Dakota Ave and east of S 1st Street in Roslyn, Washington (Figure 1; Figure 2). The project proponent plans to develop part of the land for attainable housing while preserving the rest as greenspace and wetland (Figure 3). The monitoring was required pursuant of SEPA, Executive Order 05-05 by the Department of Archaeology and Historic Preservation (DAHP) due to its location within a known, potentially National Register of Historic Places (NRHP) eligible archaeology site, 45KT2784 (No. 4 Mine). Prior geotechnical testing was conducted on the site in 2021 (Landreau & Triplett 2021). This additional testing was conducted to test the boundaries of geological features identified within the 2021 geotechnical results and evaluate groundwater contamination on the site.

Site 45KT2784 is the physical remains of the Northwest Improvement Company's No. 4 Coal mine which operated between 1894 and 1909 (Churchill 1998). The No. 4 mine was the site of one of two lethal mine explosions in Roslyn. Ten miners were killed when the mine and several buildings blew up in 1909, effectively ending operation of the No. 4 mine (Orvald and Hackenberger 2008). As originally recorded, the site consisted of 38 features representing a variety of complex mine operations from powder houses to washrooms (Orvald 2007). A limited number of artifacts have been recorded at the site and these consist primarily of structural or domestic debris. See Figure 2 for boundaries of Site 45KT2784 in conjunction with project area boundaries.

Monitoring was conducted by Andrew Fleming, M.A. on April 11th and 12th, 2023. A monitoring permit for the site is included in Appendix A. Soil Cores for environmental assessment were retrieved using a track mounted direct-push drilling rig focused primarily in four areas. The test probes were located in the proximity of the foundry and slag pile, the vehicle maintenance foundation, Powerhouse foundation and Transformer platform, as well as a smaller wetland area on the south side of the property.

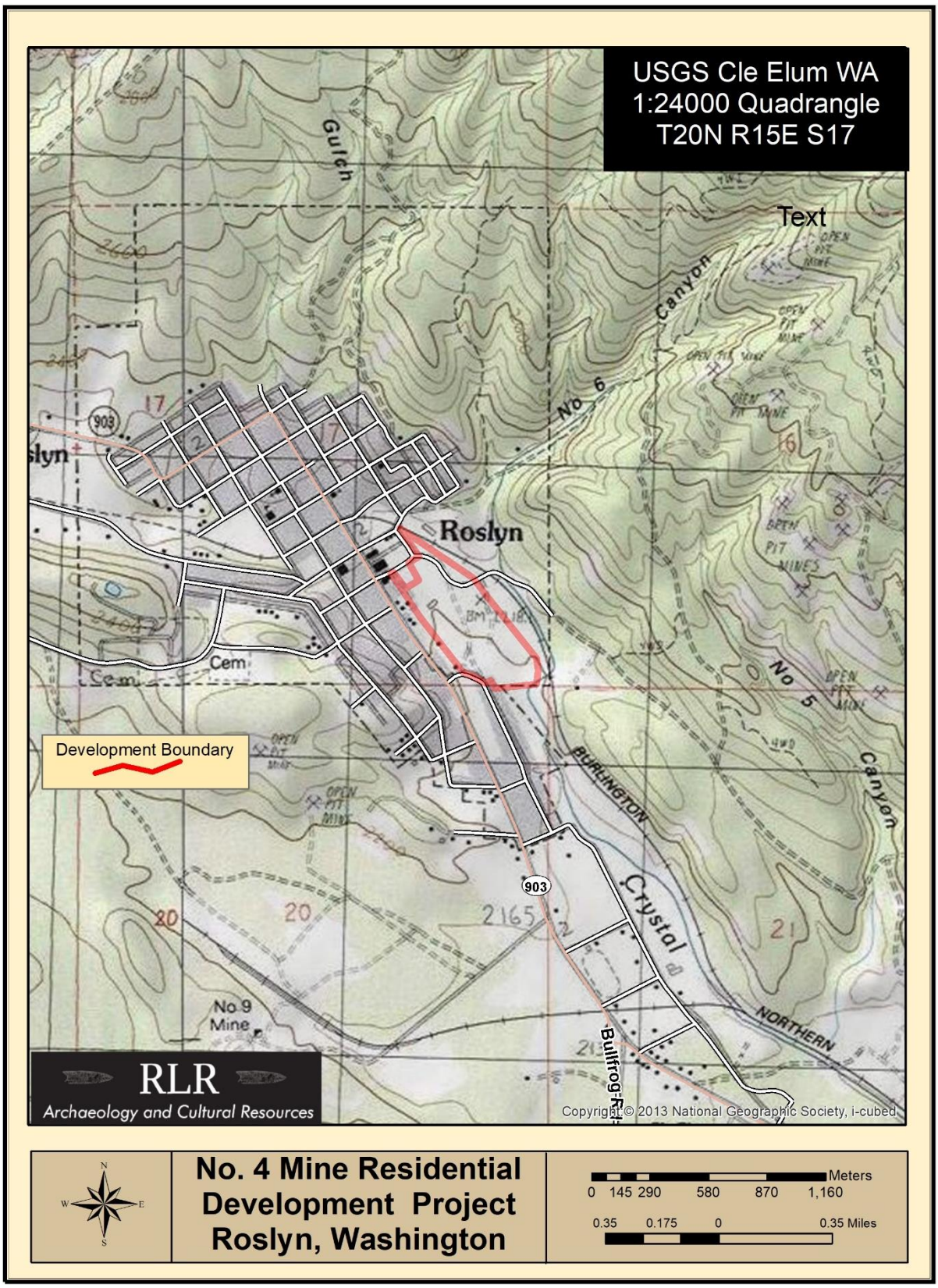



**Figure 1. Project Area on Cle Elum, WA 7.5', 1:24,000 Topographic Quadrangle.**

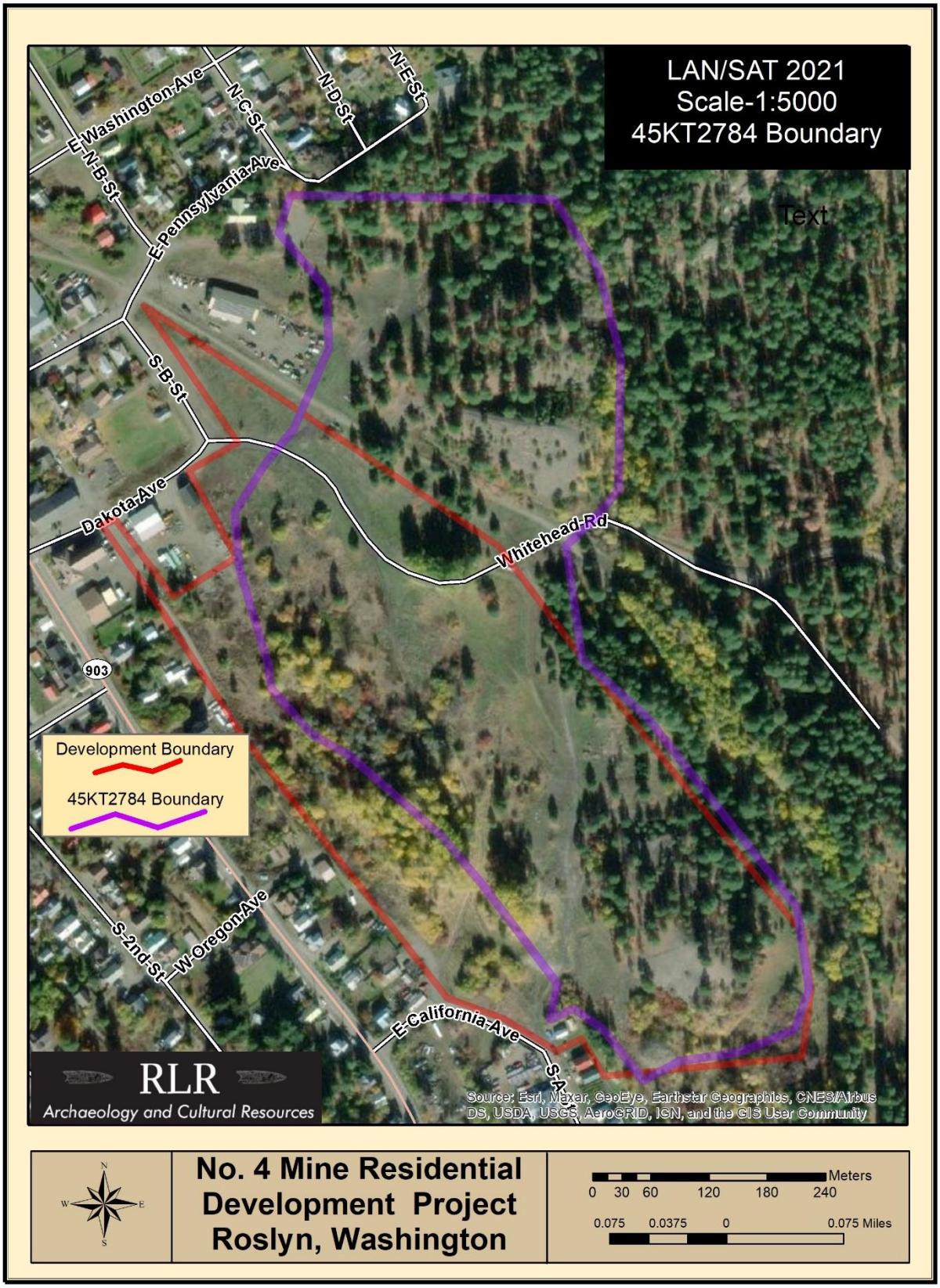



**Figure 2. Project Area boundaries with Site 45KT2784 boundaries on Orthographic Map.**

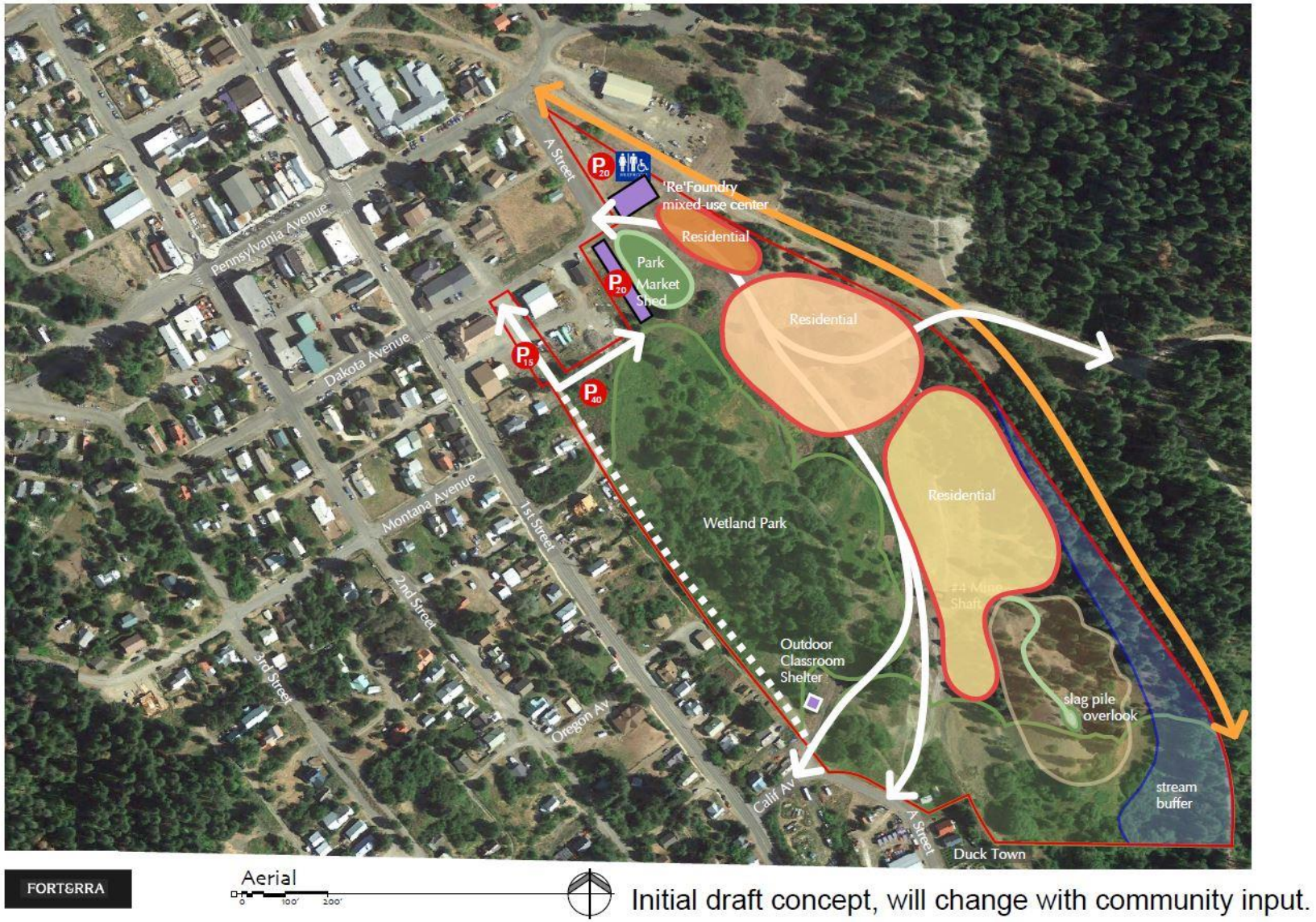



**Figure 3 Client Initial Concept Map of the Proposed project area (map courtesy of Forterra | Land for Good).**

# Monitoring Results

## April 2023: Environmental Assessment

**Date of Monitoring, Weather Conditions**: April 11-12, 2023. The weather on April 11th was overcast with periods of precipitation ranging from rain to snow. April 12th was clear and sunny with moderate wind. Temperatures ranged between 33-45 degrees F.

**Field Personnel**: Andrew Fleming, M.A.

Findings: Andrew Fleming observed the excavation of 23 environmental assessment probes throughout the project area (Figure 4). The planned probes were primarily focused in four areas: the vehicle maintenance foundation; the foundry; the powerhouse; and a forested area noted as wetland during the prior monitoring event. The probes were taken using a track mounted Geoprobe machine, which retrieved cores two inches in diameter in five-foot segments to a max depth of twenty feet below surface (**Table 1**; Figure 5). Probes were terminated upon contact with ground water, and a 5-foot sample did not necessarily translate to 5 feet of soil recovery (Figure 6). Subsurface cultural material recovered was limited. Most of the cultural material recovered amounted to non-diagnostic brick fill material concentrated in the area around the powerhouse. However, N=8 white ceramic fragments, and N=1 brown glass fragment was also noted across the site (Figure 7).

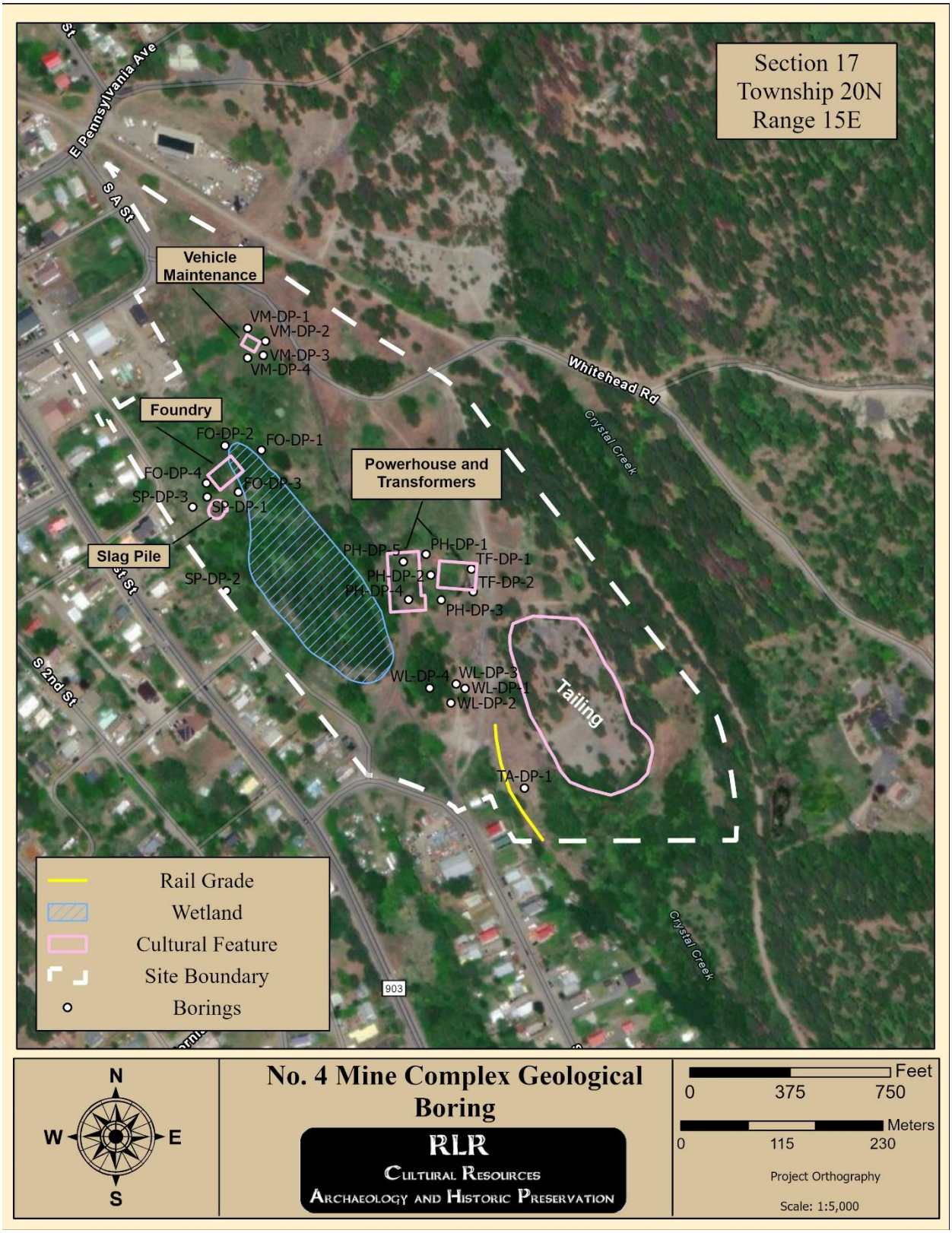



**Figure 4. Map of Boring Locations and Nearby Features (Data provided by Maul Foster & Alongi, Inc.)**

**Table 1 Summary of April 2023 Tests**

| No. | Depth of Termination (Feet) | Description | Notes |
|---|---|---|---|
| SP-DP-2 | 18 ½ | Light tan sandy clay; compact to Gray gravelly sand. | No CM identified |
| SP-DP-3 | 15 | Light tan sandy clay | Approximately 15 meters from slag pile at 270 degrees. N=5 white ceramic fragments measuring less than 1 inch in length. N=1 Metal fragment less than 1 inch in length. |
| SP-DP-1 | 5 | Light tan sandy clay | No CM identified |
| FO-DP-4 | 10 | Light tan sandy clay | No CM identified |
| FO-DP-3 | 5 | Dark black soil; gravelly. Possibly slag and other fill material. | N=1 non-diagnostic brown glass fragment less than ½ inch in length. 5 meters SW of concrete foundry foundation. May be within extremities of slag pile. |
| FO-DP-2 | 5 | Light brown sandy clay | No CM identified |
| FO-DP-1 | 5 | Light Brown to gray sandy clay | No CM identified |
| VM-DP-4 | 5 | Light brown to gray sandy clay | No CM identified |
| VM-DP-3 | 5 | Dark black fill material top 6 inches then to light tan sandy clay | Non-diagnostic brick debris |
| VM-DP-2 | 5 | Black fill material and brick top 6 to 10 inches then to light tan sandy clay material | Non-diagnostic brick debris |
| VM-DP-1 | 5 | Brick and charcoal in top foot below surface within a dark brown soil matrix before transitioning to a light brown sandy clay. | Non-diagnostic brick and charcoal. |
| PH-DP-4 | 15 | Brick and charcoal fill in the top 4 inches below surface | Non-diagnostic brick and charcoal.; within |

| | | | |
|---|---|---|---|
| | | transitioning to a light tan sandy clay. | Powerhouse foundation. |
| PH-DP-2 | Refusal | Lots of brick visible on surface | N/A |
| PH-DP-2A | Refusal | Within a possible footing' lots of surface brick and metal fragments two feet north of original test point. | N/A |
| PH-DP-2B | 5 | 3 feet south of the initial test point. Primarily fill material in the in top 2 ½ feet below surface. | N=1 White ceramic insulator fragment and N=3 white ceramic shards within top 2 ½ feet. |
| PH-DP-1 | Refusal | Near building footprint. | N/A |
| PH-DP-1A | 5 | 3 feet north of the initial test location. 7" of red brick; fill material and charcoal, before transitioning into light brown sandy clay. | Non-diagnostic brick debris and charcoal 7" below surface. |
| PH-DP-5 | 5 | Top one foot below surface is comprised of brick and fill material before transitioning to light tan sandy clay. | Non -diagnostic brick top 12 inches below surface. |
| PH-DP-3 | 5 | Brick debris and dark brown fill material in top 6 inches below surface then transitioning to light tan sandy clay above a bed of angular gravel. | Non-diagnostic brick debris. |
| TF-DP-2 | 5 | Dark brown silt lightening with depth over gravely brick fill material. | Brick fill approximately 1 ½ feet below surface. |
| TF-DP-1 | 5 | Top 10 inches is an orange-brown sandy silt transitioning to a 14-inch segment of gray rocky material then to gray, brown sandy clay. | No CM Identified |
| WL-DP-4 | 5 | Top 9 inches Duff with a brown, orange soil matrix. A hard orange gravely material from 9 | No CM Identified |

| | | | |
|---|---|---|---|
| | | to 23 inches. Wood debris from 24 to 42 inches and gray, orange clay from 42 inches on. | |
| WL-DP-1 | 10 | Brown silt with gravel inclusions one foot below surface. | No CM Identified |
| WL-DP-3 | 10 | Shale-like fill material for approximately 2 feet before transitioning to a dark brown gravelly sand for 1 foot then to light brown, orange sandy clay. | No CM Identified |
| WL-DP-2 | 15 | Located on a disturbed slope, potential spoil. Dark Brown topsoil and duff to 6 inches below surface then brown silt with pebble inclusions from 6 inches to 12 inches below surface. Gray rock angular and broken from 12 inches to 26 inches below surface. Fark brown gravelly sand from 26 inches to 32 inches below surface. Orange-gray clay from 32 inches below surface to termination. | No CM Identified |
| TA-DP-1 | 15 | Located between the historic rail grade and the tailing pile at the southeast end of the site. Dark brown silt is present to 6 inches below surface. Dark brown gravelly sand and charcoal fill is present from 6 inches to 37 inches below surface. Gray-orange clay is present from 37 to 68 inches below surface. Gray gravelly clay is present from 68 | No CM Identified |

| | | | |
|---|---|---|---|
| | | inches below surface on. | |



**Figure 5. PH-DP-4; View: N.**




**Figure 6. PH-DP-4 Core Overview; Detail.**

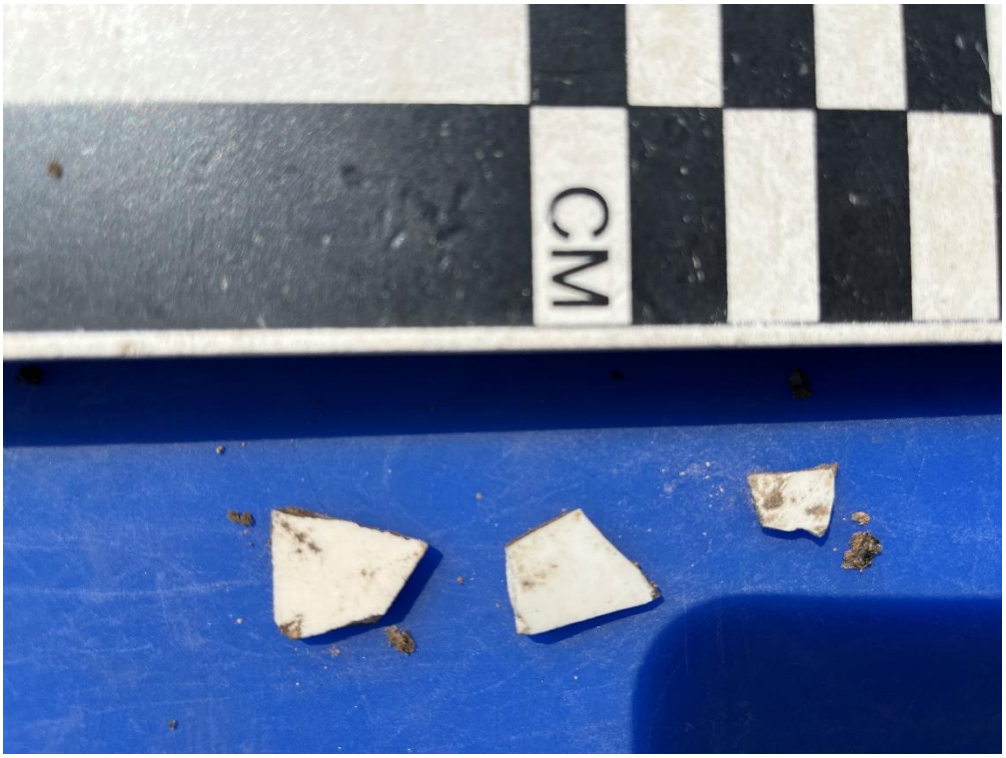



**Figure 7. White Ceramic recovered from SP-DP-3; Detail.**

## Findings and Recommendations

Limited cultural material (ceramic, metal, and brick) was found subsurface during testing. No diagnostic material was found, but contextually fits within the historic setting of the No. 4 mine.

Given that the proposed project plans to disturb the remains of an NRHP-eligible property (45KT2784), **RLR continues to recommend survey and testing in the proposed areas of disturbance and a plan to further explore, test allowing a detailed update to the 45KT2784 site record to take place before construction begins.**

# References Cited

Churchill, Thomas
1998 Archaeological Site Inventory Form 45KT1380, No. 9 Coal Mine Complex.

Landreau, Christopher and Mallory Triplett
2021 Archaeological Monitoring of Six Helical Pile Bores and Eleven Geotechnical Exploration Trenches at the No. 4 Mine Residential Development Project, Roslyn, Kittitas County, Washington. RLR Cultural Resources, LLC. Document on File, Ellensburg, WA

Lenz, F. K. and F. M. Miller
2002 Roslyn Historic District: Proposed Expansion. Task 1 – Mine Location and Preliminary Literature Research. Prepared for the City of Roslyn.

Orvald, Tucker
2007 Site Record for 45KT2784 for the Roslyn Historic District - Industrial Open Space.

Orvald, Tucker and Steven Hackenberger
2008 Roslyn Historic District No. 4 Coal Mine (45KT2784) Industrial Space Cultural Resource Assessment, Upper Kittitas County, Washington

# APPENDIX A:

## 2023 ARCHAEOLOGICAL SITE MONITORING PERMIT

**ARCHAEOLOGICAL SITE**
# ALTERATION, EXCAVATION, AND MONITORING PERMIT APPLICATION COVERSHEET

| | |
|---|---|
| *Please note: either the Applicant or the Co-applicant must be a professional archaeologist as defined in WAC 25-48-020 (4).* | Date:<br>2-21-23 |
| Name of Applicant & Affiliation:<br>Dan Grausz, Forterra | Name of Co-applicant & Affiliation:<br>Josh Allen, RLR Cultural Resources, LLC |
| Applicant's Address:<br>217 First Avenue South, #4189 Seattle, WA 98194 | Co-applicant's Address:<br>409 N Water Street, Suite 102, Ellensburg, WA |
| Telephone and Email Address:<br>206-669-3899<br>dgrausz@forterra.org | Telephone and Email address:<br>(208) 290-4008<br>josh@rlrcultural.com |
| Smithsonian numbers(s) for which permit is requested: 45KT2784 | Parcel Number(s) |
| Proposed Fieldwork Start Date<br>April 5, 2023 | Proposed Fieldwork End Date:<br>April 10, 2023 |
| DAHP Project Log Number: | Proposed dates for analysis and reporting: The report will be completed within 30 days following completion of fieldwork. |

Type of Alteration or Excavation Proposed (e.g. Survey, Testing, Data Recovery, Monitoring):

Monitoring Geotechnical Bores

Location of Collection for Analysis: Artifacts will be analyzed onsite and placed back in the original excavation.

Institution in which the applicant proposes to curate collections, records, photographs, and data:

Artifacts will be analyzed onsite

Agency which has jurisdiction over land in which site is located and name of agency contact (e.g. County, City, Port Authority, state, etc.): Kittitas County, City of Roslyn

Applicable state permits and/or environmental review regulations:

- ☐ Growth Management Act (GMA)
- ☒ State Environmental Policy Act (SEPA)
- ☐ Shoreline Management Act (SMA),
- ☐ Governor's Executive Order 05-05
- ☐ Forest Practices Act (FPA)
- ☐ Other _____

If you did not check the SEPA box above, is the project exempt from State Environmental Policy Act review per RCW 43.21C and WAC 197-11-800?

☐ Yes ☐ No

Will human remains be removed? ☐ Yes ☒ No

If Yes, DAHP Case #(s): _____

Signed this 21 day of February, 2023. Signed this 21 day of February, 2023.

Applicant Signature: Josh Allen

Co-Applicant's Signature: Daniel Grausz

# Archaeological Monitoring Permit for No. 4 Mine Geotechnical Bores

## History of 45KT2784

Site 45KT2784 was originally documented as part of the Roslyn Historic district in 2002 (Lenz and Miller 2002) and was formally recorded in 2007 (Orvald 2007). The site consists of 38 features recorded between 2007 and 2008 by Central Washington University (CWU). CWU conducted pedestrian survey, shovel testing, and evaluation of the site and its various features. The site is recommended as potentially eligible to the National Register of Historic Places (NRHP).

## Site Background

Site 45KT2784 is the physical remains of the Northwest Improvement Company's No. 4 Coal mine which operated between 1894 and 1909 (Churchill 1998). The No. 4 mine was the site of one of two lethal mine explosions in Roslyn. Ten miners were killed when the mine and several buildings blew up in 1909, effectively ending operation of the No. 4 mine (Orvald and Hackenberger 2008). As originally recorded, the site consisted of 38 features representing a broad extent of mine operations from powder houses to washrooms (Orvald 2007). A limited number of artifacts have been recorded at the site and these consist primarily of structural or domestic debris.

## Project Description

Forterra is proposing to conduct 15 geotechnical bores within the site boundaries of the No. 4 mine complex. The purpose of the bores is to determine the type and structure of the soil and bedrock which underlay the project.

The bore locations are shown in Figure 1. The excavations will be adjacent to features 1(power house), 8 (lumber shed footings), 10 (foundry), 11 (vertical pipe), and 5 (No 4 Shafts). The helical test excavation will consist of a 2.25-inches diameter excavation that may extend between 5-20 feet deep. The tests will be conducted via a truck-mounted auger.




**Figure 1. Proposed bore locations (Yellow Dots) Courtesy of Foreterra**

**Proposed Monitoring Methods**

This monitoring permit pertains to activities planned within the boundaries of archaeological site 45KT2784.

The monitor will observe excavation and soil removal around and in front of working equipment. This observation will require close communication and cooperation with contractor personnel. Monitors will stand on the edge of an excavation to observe sediment as it is excavated. To evaluate potential archaeological materials, monitors may request that excavation be conducted slowly or that other modified excavation procedures be used that could provide exposures of subsurface sediments and stratigraphy. During equipment operation, the monitor(s) will sample excavated soils using 1/4-inch screens. The sampling frequency will vary depending on the proximity to known resources or any newly discovered resources.

**Inadvertent Discovery Procedure.**

As the proposed work will take place within the site boundaries of an NRHP eligible resource, RLR will notify DAHP and consulting parties of any inadvertent discovery.

1. The archaeologist will stop in that area. Upon notification of potential archaeological deposit discovery from the archaeological monitor, RLR will promptly contact DAHP and consulting parties. Parties will be contacted by telephone. Contact information is provided below.

2. The discovery will be kept confidential. After halting construction, securing the site, and notifying the contractor, the archaeologist will conduct a brief in-field evaluation. Results of the field evaluation will be provided to DAHP and the Tribes for review.

3. The archaeologist may permit monitored construction to continue 100 feet away from the inadvertent discovery area, if feasible. The final site treatment, workplan, and terms for the resumption of work will be determined through consultation with DAHP and consulting parties.

4. If artifacts are located which cannot remain on-site, a repository will be determined through consultation with DAHP and consulting parties.

If the inadvertent discovery consists of human remains:

1. The archaeologist will stop in that area. Upon notification of potential archaeological discovery of human remains from the archaeological monitor, RLR will promptly contact DAHP, consulting parties, the county coroner, and local law enforcement.

    a. All persons who know of the existence and location of human remains must, by law, **notify the county coroner and local law enforcement**. This must be done in the most expeditious manner possible. (RCW 27.44; 68.50; 68.60)

    b. Any person engaging in ground disturbing activity that encounters skeletal human remains must **cease all activity which may cause further disturbance to the remains, make a**

**reasonable effort to protect the area from further disturbance, report the presence and location of those remains to the coroner and local law enforcement** (RCW 27.44; 68.50; 68.60). The remains should not be touched, moved, or further disturbed.

c. Parties will be contacted by telephone. Contact Information is provided below.

2. The county coroner will assume jurisdiction over the human skeletal remains and make a determination of whether those remains are forensic or non-forensic. (RCW 27.44; 68.50; 68.60)

3. If the county coroner determines the remains are non-forensic, then the DAHP will take jurisdiction over the remains. (RCW 27.44; 68.50; 68.60)

4. The State Physical Anthropologist will make a determination of whether the remains are Indian or Non-Indian and report that finding to the affected parties. (RCW 27.44, 68.50; 68.60)

5. The DAHP will handle all consultation with the affected parties as to the future preservation, excavation, and disposition of the remains if there is no federal agency involved.

Questions:

Dr. Guy Tasa
State Physical Anthropologist, DAHP
Email: guy.tasa@dahp.wa.gov
Phone: (360) 586-3534Cell: (360) 790-1633
Address: 1063 South Capitol Way, Suite 106, PO Box 48343, Olympia, Washington 98501

**Project Report**

If no materials are discovered before project completion, RLR Cultural Resources will submit a letter report detailing the findings of the monitoring activities within the following timetable. If remains are discovered, a monitoring report will be produced summarizing the findings, and the consultation process will continue with the concerned tribal and governmental groups.

Timetable: Three weeks from the date of project completion, a monitoring report will be submitted as the final deliverable for this project.

**E. Josh Allen, M.S. 409 N Water Street Suite 102, Ellensburg, WA 98926**

**F. Dan Grausz, 217 First Avenue South, #4189 Seattle, WA 98194**

**G. Site form will be filed following project completion.**

**Contact Information**

**Sydney Hanson, DAHP**

Email: sydney.hanson@dahp.wa.gov

Phone: (360) 280-7563

**Lance Wollwage, DAHP**

Email: Lamce.Wollwage@DAHP.WA.gov

Phone: (360) 890-2616

**Josh Allen, RLR Archaeology**

Email: josh@rlrcultural.com

Phone: (208)-290-4008

**Dan Grausz**

Email: dgrausz@forterra.org

Phone: (206) 669-3899

**Jessica Lally, Yakama Nation**

Email: Jessica_Lally@Yakama.com

Phone: 509-865-5121 x4766

# References Cited

Churchill, Thomas
1998 Archaeological Site Inventory Form 45KT1380, No. 9 Coal Mine Complex.

Lenz, F. K. and F. M. Miller
2002 Roslyn Historic District: Proposed Expansion. Task 1 – Mine Location and Preliminary Literature Research. Prepared for the City of Roslyn.

Orvald, Tucker
2007 Site Record for 45KT2784 for the Roslyn Historic District - Industrial Open Space.

Orvald, Tucker and Steven Hackenberger
2008 Roslyn Historic District No. 4 Coal Mine (45KT2784) Industrial Space Cultural Resource Assessment, Upper Kittitas County, Washington

# APPENDIX E
## DATA VALIDATION MEMORANDUM



# DATA QUALITY ASSURANCE/QUALITY CONTROL REVIEW

PROJECT NO. M1122.05.003 | MAY 18, 2023 | FORTERRA ROSLYN LLC

Maul Foster & Alongi, Inc. (MFA), conducted an independent Stage 2A review of the quality of analytical results for groundwater, soil, and associated quality control samples collected on in April 2023 at the Roslyn No. 4 Mine in Roslyn, Washington.

Friedman & Bruya, Inc. (FBI), and Fremont Analytical, Inc. (Fremont), performed the analyses. MFA reviewed FBI report numbers 304189 and 304189-additional. A portion of one sample was subcontracted by FBI to Fremont for hexavalent chromium analysis, and the subcontracted report number 2304439 is appended to FBI report 304189. The analyses performed and the samples analyzed are listed in the following tables. Not all analyses were performed on all samples. The reviewer confirmed that the MFA project manager coordinated with the laboratory for follow-up analyses or to initiate analysis for samples initially submitted on hold. Samples that remained on hold are indicated below.

| Analysis | Reference |
|---|---|
| Diesel- motor-oil-range hydrocarbons | NWTPH-Dx |
| Hexavalent chromium | EPA 7196 |
| Percent moisture | ASTM D2216-98 |
| TCLP lead | EPA 1311/6020B |
| Total and dissolved metals | EPA 6020B |

**Notes**
ASTM = ASTM International.
EPA = U.S. Environmental Protection Agency.
NWTPH = Northwest Total Petroleum Hydrocarbons.
TCLP = toxicity characteristic leaching procedure.

| Samples Analyzed | | |
|---|---|---|
| **Report 304189** | | |
| SP-DP-2-SB-0.5 | VM-DP-4-SB-0.5 | PH-DP-5-SB-2.3 (hold) |
| SP-DP-2-SB-0.5-DUP[a] | VM-DP-4-SB-2.5 (hold) | PH-DP-4-GW-10.0 |
| SP-DP-2-SB-2.5 (hold) | SP-DP-2-GW-15.0 | PH-DP-3-SB-0.8 |
| SP-DP-2-SB-7.0 (hold) | SP-DP-2-GW-15.0-DUP | PH-DP-3-SB-2.5 (hold) |
| SP-DP-2-SB-14.5 (hold) | VM-DP-3-SB-0.5[b] | TF-DP-2-SB-0.5 |
| SP-DP-3-SB-0.5 | VM-DP-3-SB-2.5 | TF-DP-2-SB-2.5 |
| SP-DP-3-SB-0.5-DUP | VM-DP-2-SB-0.5 | TF-DP-1-SB-1.0 |
| SP-DP-3-SB-2.5 | VM-DP-2-SB-2.5 (hold) | TF-DP-1-SB-3.0 |
| SP-DP-3-SB-7.5 (hold) | VM-DP-1-SB-0.5 | WL-DP-4-SB-0.5 |
| SP-DP-3-SB-14.5 (hold) | VM-DP-1-SB-2.5 (hold) | WL-DP-4-SB-4.0 (hold) |
| SP-DP-1-SB-0.5 | PH-DP-4-SB-0.5 | WL-DP-1-SB-0.5 |

| Samples Analyzed | | |
|---|---|---|
| **Report 304189** | | |
| SP-DP-1-SB-2.5 (hold) | PH-DP-4-SB-2.5 | WL-DP-1-SB-0.5-DUP |
| FO-DP-4-SB-0.5 | PH-DP-4-SB-7.5 (hold) | WL-DP-1-SB-8.0 (hold) |
| FO-DP-4-SB-2.5 (hold) | PH-DP-4-SB-13.5 (hold) | WL-DP-3-SB-0.5 |
| FO-DP-4-SB-8.5 (hold) | PH-DP-2-SB-0.5 | WL-DP-3-SB-2.0 (hold) |
| FO-DP-2-SB-0.5 | PH-DP-2-SB-0.5-DUP (hold) | WL-DP-3-SB-7.0 (hold) |
| FO-DP-2-SB-2.5 (hold) | PH-DP-2-SB-2.5 (hold) | WL-DP-2-SB-0.3 |
| FO-DP-3-SB-0.5[(b)] | PH-DP-1-SB-1.5 | WL-DP-2-SB-13.0 (hold) |
| FO-DP-3-SB-2.5 | PH-DP-1-SB-2.5 (hold) | TA-DP-1-GW-10.0 |
| FO-DP-1-SB-1.0 | PH-DP-5-SB-0.8 | -- |
| FO-DP-1-SB-2.5 (hold) | PH-DP-5-SB-0.8-DUP | -- |

**Note**
[(a)]Sample also analyzed in subcontracted report number 2304439.
[(b)]Sample also analyzed in report number 304189-additional.

# DATA QUALIFICATION

Analytical results were evaluated according to applicable sections of U.S. Environmental Protection Agency (EPA) guidelines for data review (EPA 2020a, 2020b) and appropriate laboratory- and method-specific guidelines (EPA 1986, FBI 2022, Fremont 2020).

Data validation procedures were modified, as appropriate, to accommodate quality control requirements for methods that EPA data review procedures do not specifically address (e.g., Northwest Total Petroleum Hydrocarbons [NWTPH]-Dx).

Based on the results of the data quality review procedures described below, the data, with the appropriate final data qualifiers assigned, are considered acceptable for their intended use. Final data qualifiers represent qualifiers originating from the laboratory and accepted by the reviewer, and data qualifiers assigned by the reviewer during validation.

Final data qualifiers:

- J = result is estimated.
- J- = result is estimated, but the result may be biased low.
- U = result is non-detect at method reporting limit (MRL).
- UJ = result is non-detect with an estimated method reporting limit.

According to report 304189, FBI noted that the NWTPH-Dx diesel-range hydrocarbons results for samples PH-DP-5-SB-0.8-DUP and PH-DP-3-SB-0.8 had chromatographic patterns that did not resemble the fuel standard used for quantitation. Results were reported as diesel-range hydrocarbons instead of specific fuel products; thus, qualification was not required.

### Total And Dissolved Compounds

Total and dissolved EPA Method 6020B metals results were compared. Where dissolved metals results were greater than their associated total results, qualification was not required when the relative percent difference (RPD) was less than 20 percent.

All detected total metals results were greater than their associated dissolved metals results or met the RPD acceptance criteria.

## SAMPLE CONDITIONS

### Sample Custody

Sample custody was appropriately documented on the chain-of-custody (COC) forms accompanying the report, with the following exception:

According to the COC forms accompanying report 304189, samples were relinquished by MFA on April 13, 2023, at 12:00 p.m., and received at FBI on April 13, 2023, at 11:30 a.m. The reviewer confirmed with the sampler that samples were handed off directly to FBI at 11:30 a.m., that there were no gaps in custody, and that the 12:00 p.m. relinquishment time was written erroneously.

### Holding Times

Extractions and analyses were performed within the recommended holding times.

### Preservation and Sample Storage

The samples were preserved and stored appropriately.

### Sample Filtration

Field samples for dissolved EPA Method 6020B analysis were field-filtered with a 0.45-micron filter during sample collection.

In addition to the field-filtered fractions, MFA also submitted unpreserved and unfiltered fractions of samples SP-DP-2-GW-15.0 and SP-DP-2-GW-15.0-DUP, which were filtered and preserved at the laboratory upon sample receipt. At MFA's request, FBI reported both the field- and laboratory-filtered EPA Method 6020B dissolved metals results for these samples. FBI appropriately flagged the laboratory-filtered results. Both filtered and unfiltered fractions were submitted due to extremely high turbidity in the groundwater during sampling. Qualification of laboratory-filtered sample results was not required since samples were appropriately filtered and preserved as soon as practically possible upon sample receipt.

# REPORTING LIMITS

The laboratory evaluated results to MRLs. Samples that required dilutions because of high analyte concentrations, matrix interferences, and/or dilutions necessary for preparation and/or analysis were reported with raised MRLs.

When samples were diluted for analysis or when a higher sample volume was used for the extraction, FBI provided the preparation or dilution factor after the laboratory sample identification number.

# BLANKS

## Method Blanks

Laboratory method blanks are used to assess whether laboratory contamination was introduced during sample preparation and analysis. Laboratory method blank analyses were performed at the required frequencies. For purposes of data qualification, the laboratory method blanks were associated with all samples prepared in the analytical batch.

All laboratory method blank results were non-detect to MRLs.

## Equipment Rinsate Blanks

Equipment rinsate blanks are used to evaluate field equipment decontamination. These blanks were not required for this sampling event, as all samples were collected using dedicated, single-use equipment.

## Trip Blanks

Trip blanks are used to evaluate whether volatile organic compound contamination was introduced during sample storage and during shipment between the sampling location and the laboratory.

Trip blank samples were not required for this sampling event because samples were not analyzed for volatile organic compounds.

## Filter Blanks

Field filter blanks are used to evaluate whether contamination was introduced during field filtering procedures.

Field filter blanks were not submitted for analysis. The reviewer could not evaluate whether metals contamination was introduced during field filtering procedures.

## LABORATORY CONTROL SAMPLE AND LABORATORY CONTROL SAMPLE DUPLICATE RESULTS

A laboratory control sample (LCS) and a laboratory control sample duplicate (LCSD) are spiked with target analytes to provide information about laboratory precision and accuracy.

LCSD results were not reported for any methods. Laboratory precision was evaluated using Matrix spike (MS) and matrix spike duplicate (MSD) results. The LCS were prepared and analyzed at the required frequency.

All LCS results were within acceptance limits for percent recovery.

## LABORATORY DUPLICATE RESULTS

Laboratory duplicate results are used to evaluate laboratory precision.

FBI did not report laboratory duplicate results for any methods. Laboratory precision was evaluated using MS and MSD results. Fremont reported a laboratory duplicate for EPA Method 7196, which was prepared and analyzed at the required frequency.

Laboratory duplicate results less than five times the MRL, including non-detects, were evaluated using a control limit of the MRL of the parent sample; the absolute difference of the laboratory duplicate sample result and the parent sample result, or the MRL for non-detects, was compared to the MRL of the parent sample.

The laboratory duplicate result met the acceptance criterion.

## MATRIX SPIKE AND MATRIX SPIKE DUPLICATE RESULTS

MS and MSD results are used to evaluate laboratory precision, accuracy, and the effect of the sample matrix on sample preparation and analysis. All MS and MSD samples were prepared and analyzed at the required frequency.

When MS and MSD were prepared from samples with high concentrations of target analytes, associated MS and/or MSD percent recovery and/or RPD control limit exceedances did not require qualification because spike concentrations could not be accurately quantified. High concentrations of target analytes are defined as four times the spike amount for all analyses.

Directional bias qualifiers (i.e., J- and J+) are only assigned by the reviewer when there is overwhelming influence in one direction.

According to report 304189, the EPA Method 6020B dissolved MS and MSD (page 63 of the report) prepared with the laboratory-filtered fraction of sample SP-DP-2-GW-15.0 had an arsenic RPD above the 30 percent control limit, at 30 percent. The MSD was also below the lower percent recovery acceptance limit of 75 percent, at 66 percent. The reviewer qualified the associated sample result, as well as the associated field duplicate result, with J, as shown in the following table.

| Report | Sample | Analyte | Original Result (ug/L) | Qualified Result (ug/L) |
|---|---|---|---|---|
| 304189 | SP-DP-2-GW-15.0[a] | Dissolved arsenic | 21.5 | 21.5 J |
| | SP-DP-2-GW-15.0-DUP[a] | | 20.8 | 20.8 J |

**Notes**
J = result is estimated.
ug/L = micrograms per liter.
[a]Laboratory-filtered fraction.

According to report 304189, the EPA Method 6020B dissolved MS and MSD (page 64 of the report) prepared with the field-filtered fraction of sample SP-DP-2-GW-15.0 had arsenic results below the lower percent recovery acceptance limit of 75 percent, at 73 percent and 65 percent, respectively. The reviewer qualified the associated sample result, as well as the associated field duplicate result, with J-, as shown in the following table.

| Report | Sample | Analyte | Original Result (ug/L) | Qualified Result (ug/L) |
|---|---|---|---|---|
| 304189 | SP-DP-2-GW-15.0[a] | Dissolved arsenic | 34.2 | 34.2 J- |
| | SP-DP-2-GW-15.0-DUP[a] | | 39.7 | 39.7 J- |

**Notes**
J- = result is estimated, but the result may be biased low.
ug/L = micrograms per liter.
[a]Field-filtered fraction.

According to report 304189, the EPA Method 6020B total MS and MSD (page 65 of the report) prepared with sample SP-DP-2-GW-15.0 had arsenic results below the lower percent recovery acceptance limit of 75 percent, at 42 percent and 47 percent, respectively. The reviewer qualified the associated sample result, as well as the associated field duplicate result, with J-, as shown in the following table. These MS and MSD had poor recoveries and RPDs for several other analytes, but spike concentrations could not be accurately quantified due to high concentrations of analytes in the source sample.

| Report | Sample | Analyte | Original Result (ug/L) | Qualified Result (ug/L) |
|---|---|---|---|---|
| 304189 | SP-DP-2-GW-15.0 | Total arsenic | 35.7 | 35.7 J- |
| | SP-DP-2-GW-15.0-DUP | | 35.1 | 35.1 J- |

**Notes**
J- = result is estimated, but the result may be biased low.
ug/L = micrograms per liter.

According to report 304189, the EPA Method 6020B total MS and MSD (page 67 of the report) prepared with sample PH-DP-4-SB-0.5 had several exceedances. The MS result for arsenic had a percent recovery of 560 percent, the MSD had percent recoveries below the 75 percent lower limit for copper, lead, and zinc, ranging from 69 percent to 74 percent, and the MS and MSD RPD for arsenic, nickel, and zinc were above the 20 percent limit, ranging from

22 percent to 138 percent. The reviewer confirmed with the laboratory that the sample was very heterogeneous and had rocks and pebbles that likely impacted the results. The reviewer qualified the associated sample results with J, as shown in the following table.

| Report | Sample | Analyte | Original Result (mg/kg) | Qualified Result (mg/kg) |
|---|---|---|---|---|
| 304189 | PH-DP-4-SB-0.5 | Total arsenic | 46.5 | 46.5 J |
| | | Total copper | 75.2 | 75.2 J |
| | | Total lead | 33.7 | 33.7 J |
| | | Total nickel | 36.2 | 36.2 J |
| | | Total zinc | 173 | 173 J |
| **Notes**<br>J = result is estimated.<br>mg/kg = milligrams per kilogram. | | | | |

According to report 304189, the EPA Method 6020B total MS and MSD (page 69 of the report) prepared with sample SP-DP-3-SB-0.5-DUP had an RPD for total lead above the 20 percent limit, at 65 percent. The MSD for lead was below the lower percent recovery acceptance limit of 75 percent. at 43 percent. Lead was not reported for this sample, but the reviewer qualified the associated parent sample result with J, as shown in the following table.

| Report | Sample | Analyte | Original Result (mg/kg) | Qualified Result (mg/kg) |
|---|---|---|---|---|
| 304189 | SP-DP-3-SB-0.5 | Total lead | 91.3 | 91.3 J |
| **Notes**<br>J = result is estimated.<br>mg/kg = milligrams per kilogram. | | | | |

All remaining MS and MSD results were within acceptance limits for percent recovery and RPD.

## SURROGATE RECOVERY RESULTS

The samples were spiked with surrogate compounds to evaluate laboratory performance for individual samples for organic analyses.

All surrogate results were within percent recovery acceptance limits.

## FIELD DUPLICATE RESULTS

Field duplicate samples measure both field and laboratory precision. The following field duplicate and parent sample pairs were submitted for analysis:

| Report | Parent Sample | Field Duplicate Sample |
|---|---|---|
| 304189 | SP-DP-2-SB-0.5 | SP-DP-2-SB-0.5-DUP |

| Report | Parent Sample | Field Duplicate Sample |
|---|---|---|
| | SP-DP-3-SB-0.5 | SP-DP-3-SB-0.5-DUP |
| | SP-DP-2-GW-15.0 | SP-DP-2-GW-15.0-DUP |
| | PH-DP-2-SB-0.5 | PH-DP-2-SB-0.5-DUP |
| | PH-DP-5-SB-0.8 | PH-DP-5-SB-0.8-DUP |
| | WL-DP-1-SB-0.5 | WL-DP-1-SB-0.5-DUP |

MFA uses acceptance criteria of 100 percent RPD for results that are less than five times the MRL or 50 percent RPD for results that are greater than five times the MRL. RPD was not evaluated when both results in the sample pair were non-detect. When one result in the sample pair was non-detect, RPD was evaluated using the MRL of the non-detect result.

When one result in the sample pair was less than five times the MRL, and the other result in the sample pair was greater than five times the MRL, the reviewer used the less stringent acceptance criteria of 100 percent RPD.

Some field duplicates were not analyzed for all analytes as the associated parent samples. The reviewer could not evaluate RPD for analytes where this occurs.

Field duplicate results that exceeded the acceptance criteria were qualified by the reviewer, as shown in the following table.

| Report | Sample | Analyte | RPD (%) | Original Result (ug/L) | Qualified Result (ug/L) |
|---|---|---|---|---|---|
| 304189 | SP-DP-2-GW-15.0[a] | Dissolved chromium | 183 | 22.1 | 22.1 J |
| | SP-DP-2-GW-15.0-DUP[a] | | | 1 U | 1 UJ |
| | SP-DP-2-GW-15.0[a] | Dissolved lead | 157 | 8.35 | 8.35 J |
| | SP-DP-2-GW-15.0-DUP[a] | | | 1 U | 1 UJ |

**Notes**
J = result is estimated.
RPD = relative percent difference.
U = result is non-detect at the method reporting limit.
ug/L = micrograms per liter.
UJ = result is non-detect with an estimated method reporting limit.
[a]Field-filtered fraction.

All remaining field duplicate results met the RPD acceptance criteria.

# DATA PACKAGE

The data package was reviewed for transcription errors, omissions, and anomalies.

Chromatograms were provided for some sample results in report 304189. Review of instrument outputs is not required for Stage 2A validation. No action by the reviewer was required.

FBI released a revision for report 304189 on May 4, 2023, to correct the sample name for SP-DP-3-SB-0.5-DUP to match the COC form. Details are listed on the first cover page of the amended report.

FBI reported toxicity characteristic leaching procedure results for samples FO-DP-3-SB-0.5 and VM-DP-3-SB-0.5 separately in report number 304189-additional due to follow-up analyses requested after the final report was released, as well as system limitations.

No other issues were found.

# REFERENCES

EPA. 1986. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.* EPA publication SW-846. 3rd ed. U.S. Environmental Protection Agency. Final updates I (1993), II (1995), IIA (1994), IIB (1995), III (1997), IIIA (1999), IIIB (2005), IV (2008), V (2015), VI phase I (2017), VI phase II (2018), VI phase III (2019), VII phase I (2019), and VII phase II (2020).

EPA. 2020a. *National Functional Guidelines for Inorganic Superfund Methods Data Review.* EPA 542-R-20-006. U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation: Washington, DC. November.

EPA. 2020b. *National Functional Guidelines for Organic Superfund Methods Data Review.* EPA 540-R-20-005. U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation: Washington, DC. November.

FBI. 2022. *Quality Assurance Manual.* Rev. 18. Friedman & Bruya, Inc.: Seattle, WA. December 9.

Fremont. 2020. *Quality Assurance.* Rev. 3.5. Fremont Analytical, Inc.: Seattle, WA. August 17.

# APPENDIX F

## LABORATORY ANALYTICAL REPORTS

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

5500 4th Avenue South
Seattle, WA 98108
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

May 4, 2023

Emily Hess, Project Manager
Maul Foster Alongi
2815 2nd Ave, Suite 540
Seattle, WA 98121

Dear Ms Hess:

Included is the amended report from the testing of material submitted on April 13, 2023 from the Forterra Roslyn M1122.05.003, F&BI 304189 project. Sample ID SP-DP-3-SB--0.5-DUP has been corrected to SP-DP-3-SB-0.5-DUP.

We apologize for the inconvenience and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Amanda Bixby, Fiona Bellows
MFA0427R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

5500 4th Avenue South
Seattle, WA 98108
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

April 27, 2023

Emily Hess, Project Manager
Maul Foster Alongi
2815 2nd Ave, Suite 540
Seattle, WA 98121

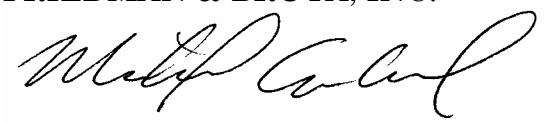
Dear Ms Hess:

Included are the results from the testing of material submitted on April 13, 2023 from the Forterra Roslyn M1122.05.003, F&BI 304189 project. There are 70 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Amanda Bixby
MFA0427R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 13, 2023 by Friedman & Bruya, Inc. from the Maul Foster Alongi Forterra Roslyn M1122.05.003, F&BI 304189 project. Samples were logged in under the laboratory ID's listed below.

| Laboratory ID | Maul Foster Alongi |
|---|---|
| 304189 -01 | SP-DP-2-SB-0.5 |
| 304189 -02 | SP-DP-2-SB-0.5-DUP |
| 304189 -03 | SP-DP-2-SB-2.5 |
| 304189 -04 | SP-DP-2-SB-7.0 |
| 304189 -05 | SP-DP-2-SB-14.5 |
| 304189 -06 | SP-DP-3-SB-0.5 |
| 304189 -07 | SP-DP-3-SB-0.5-DUP |
| 304189 -08 | SP-DP-3-SB-2.5 |
| 304189 -09 | SP-DP-3-SB-7.5 |
| 304189 -10 | SP-DP-3-SB-14.5 |
| 304189 -11 | SP-DP-1-SB-0.5 |
| 304189 -12 | SP-DP-1-SB-2.5 |
| 304189 -13 | FO-DP-4-SB-0.5 |
| 304189 -14 | FO-DP-4-SB-2.5 |
| 304189 -15 | FO-DP-4-SB-8.5 |
| 304189 -16 | FO-DP-2-SB-0.5 |
| 304189 -17 | FO-DP-2-SB-2.5 |
| 304189 -18 | FO-DP-3-SB-0.5 |
| 304189 -19 | FO-DP-3-SB-2.5 |
| 304189 -20 | FO-DP-1-SB-1.0 |
| 304189 -21 | FO-DP-1-SB-2.5 |
| 304189 -22 | VM-DP-4-SB-0.5 |
| 304189 -23 | VM-DP-4-SB-2.5 |
| 304189 -24 | SP-DP-2-GW-15.0 |
| 304189 -25 | SP-DP-2-GW-15.0-DUP |
| 304189 -26 | VM-DP-3-SB-0.5 |
| 304189 -27 | VM-DP-3-SB-2.5 |
| 304189 -28 | VM-DP-2-SB-0.5 |
| 304189 -29 | VM-DP-2-SB-2.5 |
| 304189 -30 | VM-DP-1-SB-0.5 |
| 304189 -31 | VM-DP-1-SB-2.5 |
| 304189 -32 | PH-DP-4-SB-0.5 |
| 304189 -33 | PH-DP-4-SB-2.5 |
| 304189 -34 | PH-DP-4-SB-7.5 |
| 304189 -35 | PH-DP-4-SB-13.5 |
| 304189 -36 | PH-DP-2-SB-0.5 |

CASE NARRATIVE (continued

| Laboratory ID | Maul Foster Alongi |
|---|---|
| 304189 -37 | PH-DP-2-SB-0.5-DUP |
| 304189 -38 | PH-DP-2-SB-2.5 |
| 304189 -39 | PH-DP-1-SB-1.5 |
| 304189 -40 | PH-DP-1-SB-2.5 |
| 304189 -41 | PH-DP-5-SB-0.8 |
| 304189 -42 | PH-DP-5-SB-0.8-DUP |
| 304189 -43 | PH-DP-5-SB-2.3 |
| 304189 -44 | PH-DP-4-GW-10.0 |
| 304189 -45 | PH-DP-3-SB-0.8 |
| 304189 -46 | PH-DP-3-SB-2.5 |
| 304189 -47 | TF-DP-2-SB-0.5 |
| 304189 -48 | TF-DP-2-SB-2.5 |
| 304189 -49 | TF-DP-1-SB-1.0 |
| 304189 -50 | TF-DP-1-SB-3.0 |
| 304189 -51 | WL-DP-4-SB-0.5 |
| 304189 -52 | WL-DP-4-SB-4.0 |
| 304189 -53 | WL-DP-1-SB-0.5 |
| 304189 -54 | WL-DP-1-SB-0.5-DUP |
| 304189 -55 | WL-DP-1-SB-8.0 |
| 304189 -56 | WL-DP-3-SB-0.5 |
| 304189 -57 | WL-DP-3-SB-2.0 |
| 304189 -58 | WL-DP-3-SB-7.0 |
| 304189 -59 | WL-DP-2-SB-0.3 |
| 304189 -60 | WL-DP-2-SB-13.0 |
| 304189 -61 | TA-DP-1-GW-10.0 |

Sample SP-DP-2-SB-0.5-DUP was sent to Fremont Analytical for hexavalent chromium analysis. The report is enclosed.

The water samples SP-DP-2-GW-15.0 and SP-DP-2-GW-15.0-DUP were both field and lab filtered for dissolved metals. The lab filtered data were qualified accordingly and both sets of data were reported.

All quality control requirements were acceptable.

Date of Report: 04/27/23
Date Received: 04/13/23
Project: Forterra Roslyn M1122.05.003, F&BI 304189
Date Extracted: 04/13/22 and 04/19/22
Date Analyzed: 04/13/22 and 04/19/22

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES FOR PERCENT MOISTURE USING ASTM D2216-98**

| Sample ID<br>Laboratory ID | % Moisture |
|---|---|
| SP-DP-2-SB-0.5<br>304189-01 | 21 |
| SP-DP-2-SB-0.5-DUP<br>304189-02 | 21 |
| SP-DP-3-SB-0.5<br>304189-06 | 27 |
| SP-DP-3-SB-0.5-DUP<br>304189-07 | 30 |
| SP-DP-3-SB-2.5<br>304189-08 | 19 |
| SP-DP-1-SB-0.5<br>304189-11 | 24 |
| FO-DP-4-SB-0.5<br>304189-13 | 22 |
| FO-DP-2-SB-0.5<br>304189-16 | 23 |
| FO-DP-3-SB-0.5<br>304189-18 | 11 |
| FO-DP-3-SB-2.5<br>304189-19 | 29 |
| FO-DP-1-SB-1.0<br>304189-20 | 27 |
| VM-DP-4-SB-0.5<br>304189-22 | 22 |

Date of Report: 04/27/23
Date Received: 04/13/23
Project: Forterra Roslyn M1122.05.003, F&BI 304189
Date Extracted: 04/13/22 and 04/19/22
Date Analyzed: 04/13/22 and 04/19/22

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES FOR PERCENT MOISTURE USING ASTM D2216-98**

| Sample ID<br>Laboratory ID | % Moisture |
|---|---|
| VM-DP-3-SB-0.5<br>304189-26 | 29 |
| VM-DP-3-SB-2.5<br>304189-27 | 25 |
| VM-DP-2-SB-0.5<br>304189-28 | 25 |
| VM-DP-1-SB-0.5<br>304189-30 | 20 |
| PH-DP-4-SB-0.5<br>304189-32 | 22 |
| PH-DP-4-SB-2.5<br>304189-33 | 39 |
| PH-DP-2-SB-0.5<br>304189-36 | 25 |
| PH-DP-1-SB-1.5<br>304189-39 | 31 |
| PH-DP-5-SB-0.8<br>304189-41 | 19 |
| PH-DP-5-SB-0.8-DUP<br>304189-42 | 18 |
| PH-DP-3-SB-0.8<br>304189-45 | 17 |
| TF-DP-2-SB-0.5<br>304189-47 | 22 |

Date of Report: 04/27/23
Date Received: 04/13/23
Project: Forterra Roslyn M1122.05.003, F&BI 304189
Date Extracted: 04/13/22 and 04/19/22
Date Analyzed: 04/13/22 and 04/19/22

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES FOR PERCENT MOISTURE USING ASTM D2216-98**

| Sample ID<br>Laboratory ID | % Moisture |
|---|---|
| TF-DP-2-SB-2.5<br>304189-48 | 24 |
| TF-DP-1-SB-1.0<br>304189-49 | 33 |
| TF-DP-1-SB-3.0<br>304189-50 | 21 |
| WL-DP-4-SB-0.5<br>304189-51 | 30 |
| WL-DP-1-SB-0.5<br>304189-53 | 14 |
| WL-DP-1-SB-0.5-DUP<br>304189-54 | 16 |
| WL-DP-3-SB-0.5<br>304189-56 | 13 |
| WL-DP-2-SB-0.3<br>304189-59 | 17 |

Date of Report: 04/27/23
Date Received: 04/13/23
Project: Forterra Roslyn M1122.05.003, F&BI 304189
Date Extracted: 04/14/23
Date Analyzed: 04/14/23

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx**

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

| Sample ID<br>Laboratory ID | Diesel Range<br>($C_{10}$-$C_{25}$) | Motor Oil Range<br>($C_{25}$-$C_{36}$) | Surrogate<br>(% Recovery)<br>(Limit 50-150) |
|---|---|---|---|
| PH-DP-4-SB-0.5<br>304189-32 | 210 | <250 | 106 |
| PH-DP-2-SB-0.5<br>304189-36 | <50 | <250 | 98 |
| PH-DP-1-SB-1.5<br>304189-39 | 140 | <250 | 103 |
| PH-DP-5-SB-0.8<br>304189-41 | <50 | 610 | 102 |
| PH-DP-5-SB-0.8-DUP<br>304189-42 | 130 x | 1,100 | 103 |
| PH-DP-3-SB-0.8<br>304189-45 | 90 x | 980 | 99 |
| Method Blank<br>03-904 MB | <50 | <250 | 101 |

## Analysis For Dissolved Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | SP-DP-2-GW-15.0 f | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/19/23 | Lab ID: | 304189-24 |
| Date Analyzed: | 04/19/23 | Data File: | 304189-24.163 |
| Matrix: | Water | Instrument: | ICPMS2 |
| Units: | ug/L (ppb) | Operator: | SP |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Chromium | <1 |
| Lead | <1 |

## Analysis For Dissolved Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | SP-DP-2-GW-15.0 f | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/19/23 | Lab ID: | 304189-24 x10 |
| Date Analyzed: | 04/19/23 | Data File: | 304189-24 x10.150 |
| Matrix: | Water | Instrument: | ICPMS2 |
| Units: | ug/L (ppb) | Operator: | SP |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 21.5 |

## Analysis For Dissolved Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | SP-DP-2-GW-15.0-DUP f | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/19/23 | Lab ID: | 304189-25 |
| Date Analyzed: | 04/19/23 | Data File: | 304189-25.166 |
| Matrix: | Water | Instrument: | ICPMS2 |
| Units: | ug/L (ppb) | Operator: | SP |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Chromium | <1 |
| Lead | <1 |

## Analysis For Dissolved Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | SP-DP-2-GW-15.0-DUP f | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/19/23 | Lab ID: | 304189-25 x10 |
| Date Analyzed: | 04/19/23 | Data File: | 304189-25 x10.153 |
| Matrix: | Water | Instrument: | ICPMS2 |
| Units: | ug/L (ppb) | Operator: | SP |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 20.8 |

## Analysis For Dissolved Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Method Blank f | Client: | Maul Foster Alongi |
| Date Received: | NA | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/19/23 | Lab ID: | I3-310 mb |
| Date Analyzed: | 04/19/23 | Data File: | I3-310 mb.111 |
| Matrix: | Water | Instrument: | ICPMS2 |
| Units: | ug/L (ppb) | Operator: | SP |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |
| Chromium | <1 |
| Lead | <1 |

## Analysis For Dissolved Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | SP-DP-2-GW-15.0 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/19/23 | Lab ID: | 304189-24 |
| Date Analyzed: | 04/19/23 | Data File: | 304189-24.159 |
| Matrix: | Water | Instrument: | ICPMS2 |
| Units: | ug/L (ppb) | Operator: | SP |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Lead | 8.35 |

## Analysis For Dissolved Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | SP-DP-2-GW-15.0 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/19/23 | Lab ID: | 304189-24 x10 |
| Date Analyzed: | 04/19/23 | Data File: | 304189-24 x10.146 |
| Matrix: | Water | Instrument: | ICPMS2 |
| Units: | ug/L (ppb) | Operator: | SP |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 34.2 |
| Chromium | 22.1 |

## Analysis For Dissolved Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | SP-DP-2-GW-15.0-DUP | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/19/23 | Lab ID: | 304189-25 |
| Date Analyzed: | 04/19/23 | Data File: | 304189-25.162 |
| Matrix: | Water | Instrument: | ICPMS2 |
| Units: | ug/L (ppb) | Operator: | SP |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Chromium | <1 |
| Lead | <1 |

## Analysis For Dissolved Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | SP-DP-2-GW-15.0-DUP | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/19/23 | Lab ID: | 304189-25 x10 |
| Date Analyzed: | 04/19/23 | Data File: | 304189-25 x10.149 |
| Matrix: | Water | Instrument: | ICPMS2 |
| Units: | ug/L (ppb) | Operator: | SP |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 39.7 |

## Analysis For Dissolved Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Maul Foster Alongi |
| Date Received: | NA | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/19/23 | Lab ID: | I3-309 mb |
| Date Analyzed: | 04/19/23 | Data File: | I3-309 mb.113 |
| Matrix: | Water | Instrument: | ICPMS2 |
| Units: | ug/L (ppb) | Operator: | SP |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |
| Chromium | <1 |
| Lead | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | SP-DP-2-GW-15.0 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-24 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-24.150 |
| Matrix: | Water | Instrument: | ICPMS2 |
| Units: | ug/L (ppb) | Operator: | SP |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 35.7 |
| Cadmium | 2.53 |
| Lead | 58.1 |
| Mercury | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | SP-DP-2-GW-15.0 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-24 x10 |
| Date Analyzed: | 04/17/23 | Data File: | 304189-24 x10.051 |
| Matrix: | Water | Instrument: | ICPMS2 |
| Units: | ug/L (ppb) | Operator: | SP |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Chromium | 159 |
| Copper | 251 |
| Nickel | 215 |
| Zinc | 293 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | SP-DP-2-GW-15.0-DUP | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-25 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-25.163 |
| Matrix: | Water | Instrument: | ICPMS2 |
| Units: | ug/L (ppb) | Operator: | SP |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 35.1 |
| Cadmium | 2.50 |
| Lead | 60.9 |
| Mercury | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | SP-DP-2-GW-15.0-DUP | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-25 x10 |
| Date Analyzed: | 04/17/23 | Data File: | 304189-25 x10.054 |
| Matrix: | Water | Instrument: | ICPMS2 |
| Units: | ug/L (ppb) | Operator: | SP |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Chromium | 166 |
| Copper | 257 |
| Nickel | 229 |
| Zinc | 244 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | PH-DP-4-GW-10.0 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-44 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-44.164 |
| Matrix: | Water | Instrument: | ICPMS2 |
| Units: | ug/L (ppb) | Operator: | SP |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 2.05 |
| Cadmium | <1 |
| Chromium | 9.96 |
| Copper | 11.4 |
| Lead | 2.73 |
| Mercury | <1 |
| Nickel | 9.14 |
| Zinc | 21.6 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | TA-DP-1-GW-10.0 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-61 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-61.165 |
| Matrix: | Water | Instrument: | ICPMS2 |
| Units: | ug/L (ppb) | Operator: | SP |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 1.48 |
| Cadmium | <1 |
| Chromium | 2.23 |
| Copper | <5 |
| Lead | <1 |
| Mercury | <1 |
| Nickel | 4.24 |
| Zinc | 5.37 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Maul Foster Alongi |
| Date Received: | NA | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | I3-296 mb |
| Date Analyzed: | 04/17/23 | Data File: | I3-296 mb.048 |
| Matrix: | Water | Instrument: | ICPMS2 |
| Units: | ug/L (ppb) | Operator: | SP |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |
| Cadmium | <1 |
| Chromium | <1 |
| Copper | <5 |
| Lead | <1 |
| Mercury | <1 |
| Nickel | <1 |
| Zinc | <5 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | SP-DP-2-SB-0.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-01 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-01.116 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 3.95 |
| Cadmium | <1 |
| Chromium | 39.5 |
| Copper | 17.5 |
| Lead | 14.6 |
| Mercury | <1 |
| Nickel | 64.6 |
| Zinc | 45.4 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | SP-DP-2-SB-0.5-DUP | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-02 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-02.119 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 4.41 |
| Cadmium | <1 |
| Chromium | 41.0 |
| Copper | 22.6 |
| Lead | 41.7 |
| Mercury | <1 |
| Nickel | 60.6 |
| Zinc | 56.2 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | SP-DP-3-SB-0.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-06 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-06.120 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 9.78 |
| Cadmium | 2.66 |
| Chromium | 19.2 |
| Copper | 80.2 |
| Lead | 91.3 |
| Mercury | <1 |
| Nickel | 31.7 |
| Zinc | 242 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | SP-DP-3-SB-0.5-DUP | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/20/23 | Lab ID: | 304189-07 |
| Date Analyzed: | 04/20/23 | Data File: | 304189-07.089 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Cadmium | 2.32 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | SP-DP-3-SB-2.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/20/23 | Lab ID: | 304189-08 |
| Date Analyzed: | 04/20/23 | Data File: | 304189-08.092 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Cadmium | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | SP-DP-1-SB-0.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-11 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-11.121 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 4.85 |
| Cadmium | <1 |
| Chromium | 24.0 |
| Copper | 25.1 |
| Lead | 14.7 |
| Mercury | <1 |
| Nickel | 20.5 |
| Zinc | 51.1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | FO-DP-4-SB-0.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-13 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-13.122 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 2.48 |
| Cadmium | <1 |
| Chromium | 22.9 |
| Copper | 12.1 |
| Lead | 6.86 |
| Mercury | <1 |
| Nickel | 19.0 |
| Zinc | 67.5 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | FO-DP-2-SB-0.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-16 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-16.123 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 1.82 |
| Cadmium | <1 |
| Chromium | 16.0 |
| Copper | 10.0 |
| Lead | 11.4 |
| Mercury | <1 |
| Nickel | 14.6 |
| Zinc | 56.7 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | FO-DP-3-SB-0.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-18 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-18.124 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 15.4 |
| Cadmium | 5.45 |
| Mercury | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | FO-DP-3-SB-0.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-18 x10 |
| Date Analyzed: | 04/17/23 | Data File: | 304189-18 x10.046 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Chromium | 33.8 |
| Copper | 165 |
| Lead | 988 |
| Nickel | 36.8 |
| Zinc | 1,720 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | FO-DP-3-SB-2.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/20/23 | Lab ID: | 304189-19 |
| Date Analyzed: | 04/20/23 | Data File: | 304189-19.093 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Cadmium | <1 |
| Lead | 72.1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | FO-DP-1-SB-1.0 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-20 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-20.125 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 2.56 |
| Cadmium | <1 |
| Chromium | 16.5 |
| Copper | 11.1 |
| Lead | 6.95 |
| Mercury | <1 |
| Nickel | 17.2 |
| Zinc | 59.4 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | VM-DP-4-SB-0.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-22 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-22.128 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 9.52 |
| Cadmium | <1 |
| Chromium | 14.2 |
| Copper | 63.0 |
| Lead | 28.7 |
| Mercury | <1 |
| Nickel | 26.4 |
| Zinc | 67.7 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | VM-DP-3-SB-0.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-26 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-26.129 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 25.9 |
| Cadmium | 5.33 |
| Mercury | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | VM-DP-3-SB-0.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-26 x5 |
| Date Analyzed: | 04/17/23 | Data File: | 304189-26 x5.047 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Chromium | 39.8 |
| Copper | 106 |
| Lead | 301 |
| Nickel | 25.0 |
| Zinc | 4,110 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | VM-DP-3-SB-2.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/20/23 | Lab ID: | 304189-27 |
| Date Analyzed: | 04/21/23 | Data File: | 304189-27.040 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 3.50 |
| Cadmium | <1 |
| Lead | 6.49 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | VM-DP-2-SB-0.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-28 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-28.130 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 9.08 |
| Cadmium | <1 |
| Chromium | 13.7 |
| Copper | 60.1 |
| Lead | 81.0 |
| Mercury | <1 |
| Nickel | 24.5 |
| Zinc | 108 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | VM-DP-1-SB-0.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-30 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-30.131 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 14.6 |
| Cadmium | <1 |
| Chromium | 12.1 |
| Copper | 53.8 |
| Lead | 67.9 |
| Mercury | <1 |
| Nickel | 19.2 |
| Zinc | 105 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | PH-DP-4-SB-0.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-32 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-32.132 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 46.5 |
| Cadmium | 1.36 |
| Chromium | 20.2 |
| Copper | 75.2 |
| Lead | 33.7 |
| Mercury | <1 |
| Nickel | 36.2 |
| Zinc | 173 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | PH-DP-4-SB-2.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/20/23 | Lab ID: | 304189-33 |
| Date Analyzed: | 04/20/23 | Data File: | 304189-33.097 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 7.60 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | PH-DP-2-SB-0.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-36 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-36.135 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 16.3 |
| Cadmium | <1 |
| Chromium | 10.3 |
| Copper | 20.9 |
| Lead | 10.5 |
| Mercury | <1 |
| Nickel | 15.3 |
| Zinc | 113 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | PH-DP-1-SB-1.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-39 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-39.138 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 4.96 |
| Cadmium | <1 |
| Chromium | 6.71 |
| Copper | 57.2 |
| Lead | 13.2 |
| Mercury | <1 |
| Nickel | 20.1 |
| Zinc | 10.5 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | PH-DP-5-SB-0.8 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-41 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-41.141 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 4.96 |
| Cadmium | <1 |
| Chromium | 17.4 |
| Copper | 29.5 |
| Lead | 21.1 |
| Mercury | <1 |
| Nickel | 16.2 |
| Zinc | 62.2 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | PH-DP-5-SB-0.8-DUP | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-42 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-42.142 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 4.51 |
| Cadmium | <1 |
| Chromium | 15.2 |
| Copper | 26.4 |
| Lead | 15.7 |
| Mercury | <1 |
| Nickel | 15.3 |
| Zinc | 59.5 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | PH-DP-3-SB-0.8 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-45 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-45.143 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 4.26 |
| Cadmium | <1 |
| Chromium | 10.8 |
| Copper | 27.2 |
| Lead | 119 |
| Mercury | <1 |
| Nickel | 8.95 |
| Zinc | 62.3 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | TF-DP-2-SB-0.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-47 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-47.144 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 24.7 |
| Cadmium | 1.87 |
| Chromium | 23.8 |
| Copper | 69.7 |
| Lead | 50.8 |
| Mercury | <1 |
| Nickel | 31.8 |
| Zinc | 141 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | TF-DP-2-SB-2.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/20/23 | Lab ID: | 304189-48 |
| Date Analyzed: | 04/20/23 | Data File: | 304189-48.098 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 6.16 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | TF-DP-1-SB-1.0 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-49 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-49.145 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 38.1 |
| Cadmium | 3.54 |
| Chromium | 17.6 |
| Copper | 138 |
| Lead | 24.3 |
| Mercury | <1 |
| Nickel | 30.7 |
| Zinc | 108 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | TF-DP-1-SB-3.0 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/20/23 | Lab ID: | 304189-50 |
| Date Analyzed: | 04/20/23 | Data File: | 304189-50.099 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | <1 |
| Cadmium | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | WL-DP-4-SB-0.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-51 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-51.146 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 6.47 |
| Cadmium | <1 |
| Chromium | 12.5 |
| Copper | 92.2 |
| Lead | 15.7 |
| Mercury | <1 |
| Nickel | 26.4 |
| Zinc | 36.3 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | WL-DP-1-SB-0.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-53 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-53.147 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 4.61 |
| Cadmium | <1 |
| Chromium | 30.2 |
| Copper | 27.4 |
| Lead | 11.9 |
| Mercury | <1 |
| Nickel | 25.2 |
| Zinc | 65.2 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | WL-DP-1-SB-0.5-DUP | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-54 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-54.155 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 5.73 |
| Cadmium | <1 |
| Chromium | 31.7 |
| Copper | 28.1 |
| Lead | 13.2 |
| Mercury | <1 |
| Nickel | 25.6 |
| Zinc | 69.5 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | WL-DP-3-SB-0.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-56 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-56.156 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 3.69 |
| Cadmium | <1 |
| Chromium | 19.2 |
| Copper | 14.0 |
| Lead | 5.57 |
| Mercury | <1 |
| Nickel | 26.2 |
| Zinc | 49.0 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | WL-DP-2-SB-0.3 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | 304189-59 |
| Date Analyzed: | 04/14/23 | Data File: | 304189-59.157 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 3.82 |
| Cadmium | <1 |
| Chromium | 23.3 |
| Copper | 23.4 |
| Lead | 10.7 |
| Mercury | <1 |
| Nickel | 20.2 |
| Zinc | 73.2 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Maul Foster Alongi |
| Date Received: | NA | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | I3-293 mb |
| Date Analyzed: | 04/14/23 | Data File: | I3-293 mb.100 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | <1 |
| Cadmium | <1 |
| Chromium | <1 |
| Copper | <5 |
| Lead | <1 |
| Mercury | <1 |
| Nickel | <1 |
| Zinc | <5 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Maul Foster Alongi |
| Date Received: | NA | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | I3-294 mb |
| Date Analyzed: | 04/14/23 | Data File: | I3-294 mb.102 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | <1 |
| Cadmium | <1 |
| Chromium | <1 |
| Copper | <5 |
| Lead | <1 |
| Mercury | <1 |
| Nickel | <1 |
| Zinc | <5 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Maul Foster Alongi |
| Date Received: | NA | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/14/23 | Lab ID: | I3-295 mb |
| Date Analyzed: | 04/14/23 | Data File: | I3-295 mb.106 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | <1 |
| Cadmium | <1 |
| Chromium | <1 |
| Copper | <5 |
| Lead | <1 |
| Mercury | <1 |
| Nickel | <1 |
| Zinc | <5 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Maul Foster Alongi |
| Date Received: | NA | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 04/20/23 | Lab ID: | I3-312 mb |
| Date Analyzed: | 04/20/23 | Data File: | I3-312 mb.084 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | <1 |
| Cadmium | <1 |
| Lead | <1 |

Date of Report: 04/27/23
Date Received: 04/13/23
Project: Forterra Roslyn M1122.05.003, F&BI 304189

## QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 304189-39 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | (Wet wt) Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Diesel Extended | mg/kg (ppm) | 5,000 | 160 | 102 | 105 | 70-130 | 3 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Diesel Extended | mg/kg (ppm) | 5,000 | 102 | 70-130 |

Date of Report: 04/27/23
Date Received: 04/13/23
Project: Forterra Roslyn M1122.05.003, F&BI 304189

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: 304189-24 x10 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 21.5 | 89 b | 66 b | 75-125 | 30 b |
| Chromium | ug/L (ppb) | 20 | <10 | 97 | 99 | 75-125 | 2 |
| Lead | ug/L (ppb) | 10 | <10 | 93 | 90 | 75-125 | 3 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 97 | 80-120 |
| Chromium | ug/L (ppb) | 20 | 89 | 80-120 |
| Lead | ug/L (ppb) | 10 | 89 | 80-120 |

Date of Report: 04/27/23
Date Received: 04/13/23
Project: Forterra Roslyn M1122.05.003, F&BI 304189

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: 304189-24 x10 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 34.2 | 73 b | 65 b | 75-125 | 12 b |
| Chromium | ug/L (ppb) | 20 | 22.1 | 100 b | 108 b | 75-125 | 8 b |
| Lead | ug/L (ppb) | 10 | 10.4 | 93 b | 94 b | 75-125 | 1 b |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 90 | 80-120 |
| Chromium | ug/L (ppb) | 20 | 92 | 80-120 |
| Lead | ug/L (ppb) | 10 | 93 | 80-120 |

Date of Report: 04/27/23
Date Received: 04/13/23
Project: Forterra Roslyn M1122.05.003, F&BI 304189

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 304189-24 x10 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 29.0 | 42 b | 47 b | 75-125 | 11 b |
| Cadmium | ug/L (ppb) | 5 | <10 | 89 | 93 | 75-125 | 4 |
| Chromium | ug/L (ppb) | 20 | 159 | 61 b | 90 b | 75-125 | 38 b |
| Copper | ug/L (ppb) | 20 | 251 | 14 b | 47 b | 75-125 | 108 b |
| Lead | ug/L (ppb) | 10 | 74.0 | 45 b | 56 b | 75-125 | 22 b |
| Mercury | ug/L (ppb) | 5 | <10 | 81 | 82 | 75-125 | 1 |
| Nickel | ug/L (ppb) | 20 | 215 | 51 b | 111 b | 75-125 | 74 b |
| Zinc | ug/L (ppb) | 50 | 293 | 0 b | 0 b | 75-125 | nm |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 94 | 80-120 |
| Cadmium | ug/L (ppb) | 5 | 97 | 80-120 |
| Chromium | ug/L (ppb) | 20 | 92 | 80-120 |
| Copper | ug/L (ppb) | 20 | 95 | 80-120 |
| Lead | ug/L (ppb) | 10 | 96 | 80-120 |
| Mercury | ug/L (ppb) | 5 | 84 | 80-120 |
| Nickel | ug/L (ppb) | 20 | 96 | 80-120 |
| Zinc | ug/L (ppb) | 50 | 96 | 80-120 |

Date of Report: 04/27/23
Date Received: 04/13/23
Project: Forterra Roslyn M1122.05.003, F&BI 304189

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 304189-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result (Wet wt) | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | mg/kg (ppm) | 10 | 3.12 | 93 b | 95 b | 75-125 | 2 b |
| Cadmium | mg/kg (ppm) | 10 | <1 | 97 | 100 | 75-125 | 3 |
| Chromium | mg/kg (ppm) | 50 | 31.2 | 83 b | 85 b | 75-125 | 2 b |
| Copper | mg/kg (ppm) | 50 | 13.9 | 77 b | 78 b | 75-125 | 1 b |
| Lead | mg/kg (ppm) | 50 | 11.5 | 89 b | 88 b | 75-125 | 1 b |
| Mercury | mg/kg (ppm | 5 | <1 | 88 | 92 | 75-125 | 4 |
| Nickel | mg/kg (ppm) | 25 | 51.0 | 103 b | 111 b | 75-125 | 7 b |
| Zinc | mg/kg (ppm) | 50 | 35.9 | 78 b | 84 b | 75-125 | 7 b |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | mg/kg (ppm) | 10 | 95 | 80-120 |
| Cadmium | mg/kg (ppm) | 10 | 98 | 80-120 |
| Chromium | mg/kg (ppm) | 50 | 105 | 80-120 |
| Copper | mg/kg (ppm) | 50 | 100 | 80-120 |
| Lead | mg/kg (ppm) | 50 | 100 | 80-120 |
| Mercury | mg/kg (ppm) | 5 | 98 | 80-120 |
| Nickel | mg/kg (ppm) | 25 | 101 | 80-120 |
| Zinc | mg/kg (ppm) | 50 | 100 | 80-120 |

Date of Report: 04/27/23
Date Received: 04/13/23
Project: Forterra Roslyn M1122.05.003, F&BI 304189

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 304189-32 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result (Wet wt) | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | mg/kg (ppm) | 10 | 36.2 | 560 b | 102 b | 75-125 | 138 b |
| Cadmium | mg/kg (ppm) | 10 | 1.06 | 101 | 96 | 75-125 | 5 |
| Chromium | mg/kg (ppm) | 50 | 15.8 | 93 b | 86 b | 75-125 | 8 b |
| Copper | mg/kg (ppm) | 50 | 58.7 | 88 b | 73 b | 75-125 | 19 b |
| Lead | mg/kg (ppm) | 50 | 26.3 | 82 b | 74 b | 75-125 | 10 b |
| Mercury | mg/kg (ppm | 5 | <1 | 80 | 82 | 75-125 | 2 |
| Nickel | mg/kg (ppm) | 25 | 28.2 | 106 b | 85 b | 75-125 | 22 b |
| Zinc | mg/kg (ppm) | 50 | 135 | 89 b | 69 b | 75-125 | 25 b |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | mg/kg (ppm) | 10 | 95 | 80-120 |
| Cadmium | mg/kg (ppm) | 10 | 98 | 80-120 |
| Chromium | mg/kg (ppm) | 50 | 106 | 80-120 |
| Copper | mg/kg (ppm) | 50 | 101 | 80-120 |
| Lead | mg/kg (ppm) | 50 | 100 | 80-120 |
| Mercury | mg/kg (ppm) | 5 | 103 | 80-120 |
| Nickel | mg/kg (ppm) | 25 | 103 | 80-120 |
| Zinc | mg/kg (ppm) | 50 | 100 | 80-120 |

Date of Report: 04/27/23
Date Received: 04/13/23
Project: Forterra Roslyn M1122.05.003, F&BI 304189

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 304189-39 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result (Wet wt) | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | mg/kg (ppm) | 10 | 3.42 | 108 b | 107 b | 75-125 | 1 b |
| Cadmium | mg/kg (ppm) | 10 | <1 | 104 | 99 | 75-125 | 5 |
| Chromium | mg/kg (ppm) | 50 | 4.63 | 104 | 99 | 75-125 | 5 |
| Copper | mg/kg (ppm) | 50 | 39.4 | 109 b | 113 b | 75-125 | 4 b |
| Lead | mg/kg (ppm) | 50 | 9.13 | 77 | 76 | 75-125 | 1 |
| Mercury | mg/kg (ppm | 5 | <1 | 94 | 85 | 75-125 | 10 |
| Nickel | mg/kg (ppm) | 25 | 13.8 | 110 b | 101 b | 75-125 | 9 b |
| Zinc | mg/kg (ppm) | 50 | 7.23 | 97 | 95 | 75-125 | 2 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | mg/kg (ppm) | 10 | 100 | 80-120 |
| Cadmium | mg/kg (ppm) | 10 | 103 | 80-120 |
| Chromium | mg/kg (ppm) | 50 | 111 | 80-120 |
| Copper | mg/kg (ppm) | 50 | 107 | 80-120 |
| Lead | mg/kg (ppm) | 50 | 105 | 80-120 |
| Mercury | mg/kg (ppm) | 5 | 109 | 80-120 |
| Nickel | mg/kg (ppm) | 25 | 107 | 80-120 |
| Zinc | mg/kg (ppm) | 50 | 106 | 80-120 |

Date of Report: 04/27/23
Date Received: 04/13/23
Project: Forterra Roslyn M1122.05.003, F&BI 304189

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 304189-07 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result (Wet wt) | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | mg/kg (ppm) | 10 | 6.35 | 75 b | 80 b | 75-125 | 6 b |
| Cadmium | mg/kg (ppm) | 10 | 1.62 | 92 | 96 | 75-125 | 4 |
| Lead | mg/kg (ppm) | 50 | 72.9 | 84 b | 43 b | 75-125 | 65 b |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | mg/kg (ppm) | 10 | 94 | 80-120 |
| Cadmium | mg/kg (ppm) | 10 | 98 | 80-120 |
| Lead | mg/kg (ppm) | 50 | 97 | 80-120 |

# Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased high; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the standard reporting limit. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

304189

# SAMPLE CHAIN OF CUSTODY

4/13/23 C3|J3|M4

Page # 1 of 7

Report To Emily Hess
Company Maul Foster & Alongi, Inc.
Address 109 E 13th St
City, State, ZIP Vancouver, WA 98660
Phone (360) 980-2997 Email ehess@maulfoster.com

SAMPLERS (*signature*)

PROJECT NAME: Forterra Roslyn
PO #: M1122.05.003

REMARKS: X = analyze. O = hold.
INVOICE TO: accounting@maulfoster.com

TURNAROUND TIME
☒ Standard Turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Archive Samples
☐ Other

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | ANALYSES REQUESTED: TPH-HCID | TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by 8260C | SVOCs by 8270D | PAHs 8270D-SIM | Total metals (As,Cd,Cr,Cu,Pb,Hg,Ni,Zn) | Diss. metals (As,Cd,Cr,Cu,Pb,Hg,Ni,Zn) | cPAH | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SP-DP-2-SB-0.5 | 01 | 4/11/23 | 1330 | S | 1 | | | | | | | | X | | | MS/MSD |
| SP-DP-2-SB-0.5-DUP | 02 | 4/11/23 | 1330 | S | 1 | | | | | | | | X | | ● | |
| SP-DP-2-SB-2.5 | 03 | 4/11/23 | 1335 | S | 1 | | | | | | | | O | | | |
| SP-DP-2-SB-7.0 | 04 | 4/11/23 | 1340 | S | 1 | | | | | | | | O | | | |
| SP-DP-2-SB-14.5 | 05 | 4/11/23 | 1345 | S | 1 | | | | | | | | O | | | |
| SP-DP-3-SB-0.5 | 06 | 4/11/23 | 1410 | S | 1 | | | | | | | | X | | | |
| SP-DP-3-SB-0.5-DUP | 07 | 4/11/23 | 1410 | S | 1 | | | | | | | ● | O | | | |
| SP-DP-3-SB-2.5 | 08 | 4/11/23 | 1415 | S | 1 | | | | | | | ● | O | | | |
| SP-DP-3-SB-7.5 | 09 | 4/11/23 | 1420 | S | 1 | | | | | | | | O | | | |
| SP-DP-3-SB-14.5 | 10 | 4/11/23 | 1425 | S | 1 | | | | | | | | O | | | |

per EH 4/18/23 MG

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: | Amanda Bixby | MFA | 4/13/23 | 1200 |
| Received by: | HONG NGUYEN | FBS | 4/13/23 | 11:30 |
| Relinquished by: | | | | |
| Received by: | | | | |

Samples received at 1 °C

*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*

304189

# SAMPLE CHAIN OF CUSTODY 4/13/23 C3/J3/M4

Page # 2 of 7

Report To Emily Hess
Company Maul Foster & Alongi, Inc.
Address 109 E 13th St
City, State, ZIP Vancouver, WA 98660
Phone (360) 980-2497 Email ehess@maulfoster.com

SAMPLERS (*signature*)

PROJECT NAME: Forterra Roslyn
PO#: M1122.05.003

REMARKS: X = analyze. O = hold.
INVOICE TO: accounting@maulfoster.com

TURNAROUND TIME
- [x] Standard Turnaround
- [ ] RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
- [ ] Dispose after 30 days
- [ ] Archive Samples
- [ ] Other

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | TPH-HCID | TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by 8260C | SVOCs by 8270D | Cd Pb PAHs 8270D SIM | Total Metals (As, Cd, Cr, Cu, Pb, Hg, Zn, Ni) | Diss Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SP-DP-1-SB-0.5 | 11 | 4/11/23 | 1440 | S | 1 | | | | | | | | X | | | | |
| SP-DP-1-SB-2.5 | 12 | 4/11/23 | 1445 | S | 1 | | | | | | | | O | | | | |
| Fo-DP-4-SB-0.5 | 13 | 4/11/23 | 1520 | S | 1 | | | | | | | | X | | | | |
| Fo-DP-4-SB-2.5 | 14 | 4/11/23 | 1525 | S | 1 | | | | | | | | O | | | | |
| Fo-DP-4-SB-8.5 | 15 | 4/11/23 | 1530 | S | 1 | | | | | | | | O | | | | |
| FO-DP-2-SB-0.5 | 16 | 4/11/23 | 1550 | S | 1 | | | | | | | | X | | | | |
| Fo-DP-2-SB-2.5 | 17 | 4/11/23 | 1555 | S | 1 | | | | | | | | O | | | | |
| Fo-DP-3-SB-0.5 | 18 | 4/11/23 | 1610 | S | 1 | | | | | | | | X | | | | |
| Fo-DP-3-SB-2.5 | 19 | 4/11/23 | 1615 | S | 1 | | | | | | | ● | O | | | | |
| Fo-DP-1-SB-1.0 | 20 | 4/11/23 | 1650 | S | 1 | | | | | | | | X | | | | |

| | SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|---|
| Relinquished by: | | Amanda Bixby | MFA | 4/13/23 | 1200 |
| Received by: | | HONG NGUYEN | FBA | 4/13/23 | 11:30 |
| Relinquished by: | | | | | |
| Received by: | | | Samples received at | 8°C | |

*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*

304189

# SAMPLE CHAIN OF CUSTODY 4/13/23 C3/J3/M4

Page # 3 of 7

Report To Emily Hess
Company Maul Foster & Alongi, Inc.
Address 109 E 13th St
City, State, ZIP Vancouver, WA 98660
Phone (360) 980-2497 Email ehess@maulfoster.com

SAMPLERS (signature) Amanda Bixby

PROJECT NAME: Forterra Roslyn
PO #: M1122.05.003

REMARKS
X = analyze
O = hold.

INVOICE TO: accounting@maulfoster.com

TURNAROUND TIME
☒ Standard Turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Archive Samples
☐ Other

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | TPH-HCID | TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by 8260C | SVOCs by 8270D | PAHs 8270D SIM | Total metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | Diss metals (filtered) (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FO-DP-1-SB-2.5 | 21 | 4/11/23 | 1655 | S | 1 | | | | | | | | O | | | | ● Cr, As, Pb only |
| VM-DP-4-SB-0.5 | 22 | 4/11/23 | 1710 | S | 1 | | | | | | | | X | | | | LF+FF, Both Fractions |
| VM-DP-4-SB-2.5 | 23 | 4/11/23 | 1715 | S | 1 | | | | | | | | O | | | | |
| SP-DP-2-GW-15.0 | 24 A-F | 4/12/23 | 0800 | W | 6 | | | | | | | | X | ● | | | FF = field filtered MS/<br>LF = lab filter MSD |
| SP-DP-2-GW-15.0-DUP | 25 A-C | 4/12/23 | 0800 | W | 3 | | | | | | | | X | ● | | | FF = field filter<br>LF = lab filter |
| VM-DP-3-SB-0.5 | 26 | 4/12/23 | 0920 | S | 1 | | | | | | | | X | | | | |
| VM-DP-3-SB-2.5 | 27 | 4/12/23 | 0925 | S | 1 | | | | | | | ● | O | | | | |
| VM-DP-2-SB-0.5 | 28 | 4/12/23 | 0950 | S | 1 | | | | | | | | X | | | | |
| VM-DP-2-SB-2.5 | 29 | 4/12/23 | 0955 | S | 1 | | | | | | | | O | | | | |
| VM-DP-1-SB-0.5 | 30 | 4/12/23 | 1010 | S | 1 | | | | | | | | X | | | | |

ANALYSES REQUESTED

| | SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|---|
| Relinquished by: | Amanda Bixby | Amanda Bixby | MFA | 4/13/23 | 1700 |
| Received by: | HONG NGUYEN | HONG NGUYEN | FPD | 4/13/23 | 11:30 |
| Relinquished by: | | | | | |
| Received by: | | | Sample receipt at 1 °C | | |

*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*

304189

# SAMPLE CHAIN OF CUSTODY 4/13/23

C3/J3/M4

Page # 4 of 7

Report To Emily Hess
Company Maul Foster & Alongi, Inc.
Address 109 E 13th St
City, State, ZIP Vancouver, WA 98660
Phone (360) 980-2497 Email ehess@maulfoster.com

SAMPLERS (*signature*): Amanda Bixby

PROJECT NAME: Forterra Roslyn
PO#: M1122.05.003

REMARKS
X=analyze.
O=hold.
Project specific RLs? - Yes / No

INVOICE TO
accounting@maulfoster.com

TURNAROUND TIME
☒ Standard turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | NWTPH-Dx | NWTPH-Gx | BTEX EPA 8021 | NWTPH-HCID | VOCs EPA 8260 | PAHs EPA 8270 | PCBs EPA 8082 As | Total metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | Diss Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VM-DP-1-SB-2.5 | 31 | 4/12/23 | 1015 | S | 1 | | | | | | | | O | | | | |
| PH-DP-4-SB-0.5 | 32 | 4/12/23 | 1140 | S | 1 | X | | | | | | | X | | | | MS/MSD Hold |
| PH-DP-4-SB-2.5 | 33 | 4/12/23 | 1145 | S | 1 | O | | | | | | ● | O | | | | |
| PH-DP-4-SB-7.5 | 34 | 4/12/23 | 1150 | S | 1 | O | | | | | | | O | | | | |
| PH-DP-4-SB-13.5 | 35 | 4/12/23 | 1155 | S | 1 | O | | | | | | | O | | | | |
| PH-DP-2-SB-0.5 | 36 | 4/12/23 | 1220 | S | 1 | X | | | | | | | X | | | | |
| PH-DP-2-SB-0.5-DUP | 37 | 4/12/23 | 1220 | S | 1 | O | | | | | | | O | | | | |
| PH-DP-2-SB-2.5 | 38 | 4/12/23 | 1225 | S | 1 | O | | | | | | | O | | | | |
| PH-DP-1-SB-1.5 | 39 | 4/12/23 | 1240 | S | 1 | X | | | | | | | X | | | | MS/MSD |
| PH-DP-1-SB-2.5 | 40 | 4/12/23 | 1245 | S | 1 | O | | | | | | | O | | | | |

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: Amanda Bixby | Amanda Bixby | MFA | 4/13/23 | 1200 |
| Received by: HONG NGUYEN | HONG NGUYEN | FBI | 4/13/23 | 11:30 |
| Relinquished by: | | Samples received at 1 °C | | |
| Received by: | | | | |

*Friedman & Bruya, Inc.*
*Ph. (206) 285-8282*

304189

# SAMPLE CHAIN OF CUSTODY ~~ALL~~ 4/13/23 C3/J3/M4

Page # 5 of 7

Report To Emily Hess
Company Maul Foster & Alongi, Inc.
Address 109 E 13th st
City, State, ZIP Vancouver, WA 98660
Phone (360)980-2497 Email ehess@maulfoster.com

SAMPLERS (*signature*): Amanda Bixby
PROJECT NAME: Forterra Roslyn
PO #: M1122.05.003
REMARKS: x=analyze. o=hold. Project specific RLs? - Yes / No
INVOICE TO: accounting@maulfoster.com

TURNAROUND TIME
☒ Standard turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | NWTPH-Dx | NWTPH-Gx | BTEX EPA 8021 | NWTPH-HCID | VOCs EPA 8260 | ~~PAHs EPA 8270~~ Cd | ~~PCBs EPA 8082~~ As | Total metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | Dissolved metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PH-DP-5-SB-0.8 | 41 | 4/12/23 | 1310 | S | 1 | X | | | | | | | X | | | | |
| PH-DP-5-SB-0.8-DUP | 42 | 4/12/23 | 1310 | S | 1 | X | | | | | | | X | | | | |
| PH-DP-5-SB-2.3 | 43 | 4/12/23 | 1315 | S | 1 | O | | | | | | | O | | | | |
| PH-DP-4-GW-10.0 | 44A-C | 4/12/23 | 1400 | W | 3 | ● | | | | | | | X | O | | | FF=field filtered<br>LF=lab filtered |
| PH-DP-3-SB-0.8 | 45 | 4/12/23 | 1410 | S | 1 | X | | | | | | | X | | | | |
| PH-DP-3-SB-2.5 | 46 | 4/12/23 | 1415 | S | 1 | O | | | | | | | O | | | | |
| TF-DP-2-SB-0.5 | 47 | 4/12/23 | 1430 | S | 1 | | | | | | | | X | | | | |
| TF-DP-2-SB-2.5 | 48 | 4/12/23 | 1435 | S | 1 | | | | | | | ● | O | | | | |
| TF-DP-1-SB-1.0 | 49 | 4/12/23 | 1450 | S | 1 | | | | | | | | X | | | | |
| TF-DP-1-SB-3.0 | 50 | 4/12/23 | 1455 | S | 1 | | | | | | ● | ● | O | | | | Samples received at 1 °C |

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: Amanda Bixby | Amanda Bixby | MFA | 4/13/23 | 1700 |
| Received by: Hong Nguyen | HONG NGUYEN | FDS | 4/13/23 | 11:30 |
| Relinquished by: | | | | |
| Received by: | | | | |

*Friedman & Bruya, Inc.*
*Ph. (206) 285-8282*

304189

# SAMPLE CHAIN OF CUSTODY

4/13/23

C3/J3/M4

Page # 6 of 7

Report To Emily Hess
Company Maul Foster & Alongi
Address 109 E 13th St
City, State, ZIP Vancouver, WA 98660
Phone (360) 980-2497 Email ehess@maulfoster.com

SAMPLERS (*signature*)

PROJECT NAME: Forterra Roslyn

PO #: M1122.05.003

REMARKS: X=analyze. O=hold.

INVOICE TO: accounting@maulfoster.com

TURNAROUND TIME
☒ Standard Turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Archive Samples
☐ Other

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | TPH-HCID | TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by 8260C | SVOCs by 8270D | PAHs 8270D SIM | Total metals (As,Cd, Cr,Cu,Pb,Hg,Ni,Zn) | Diss metals (As,Cd, Cr,Cu,Pb,Hg,Ni,Zn) | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WL-DP-4-SB-0.5 | 51 | 4/12/23 | 1510 | S | 1 | | | | | | | | X | | | | |
| WL-DP-4-SB-4.0 | 52 | 4/12/23 | 1515 | S | 1 | | | | | | | | O | | | | |
| WL-DP-1-SB-0.5 | 53 | 4/12/23 | 1530 | S | 1 | | | | | | | | X | | | | |
| WL-DP-1-SB-0.5-DUP | 54 | 4/12/23 | 1530 | S | 1 | | | | | | | | X | | | | |
| WL-DP-1-SB-8.0 | 55 | 4/12/23 | 1535 | S | 1 | | | | | | | | O | | | | |
| WL-DP-3-SB-0.5 | 56 | 4/12/23 | 1600 | S | 1 | | | | | | | | X | | | | |
| WL-DP-3-SB-2.0 | 57 | 4/12/23 | 1605 | S | 1 | | | | | | | | O | | | | |
| WL-DP-3-SB-7.0 | 58 | 4/12/23 | 1610 | S | 1 | | | | | | | | O | | | | |
| WL-DP2-SB-0.3 | 59 | 4/12/23 | 1640 | S | 1 | | | | | | | | X | | | | Samples received at 1°C |
| WL-DP2-SB-13.0 | 60 | 4/12/23 | 1645 | S | 1 | | | | | | | | O | | | | |

PC EH 4/18/23 NC


*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*


| | SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|---|
| Relinquished by: | | Amanda Bixby | MFA | 4/13/23 | 1200 |
| Received by: | | HONG NGUYEN | FBI | 4/13/23 | 11:30 |
| Relinquished by: | | | | | |
| Received by: | | | | | |

304189

# SAMPLE CHAIN OF CUSTODY

4/13/23 C3/T3/M4

Page # 7 of 7

Report To Emily Hess

Company Mavi Foster & Alongi, Inc

Address 609 E 13th St

City, State, ZIP Vancouver, WA 98660

Phone (360) 980-2497 Email ehess@mavifoster.com

| SAMPLERS (signature) | |
|---|---|
| PROJECT NAME: Forterra Roslyn | PO #: M1122.05.003 |
| REMARKS: X=analyze. O=hold. | INVOICE TO: accounting@mavifoster.com |

**TURNAROUND TIME**
- [X] Standard Turnaround
- [ ] RUSH
- Rush charges authorized by:

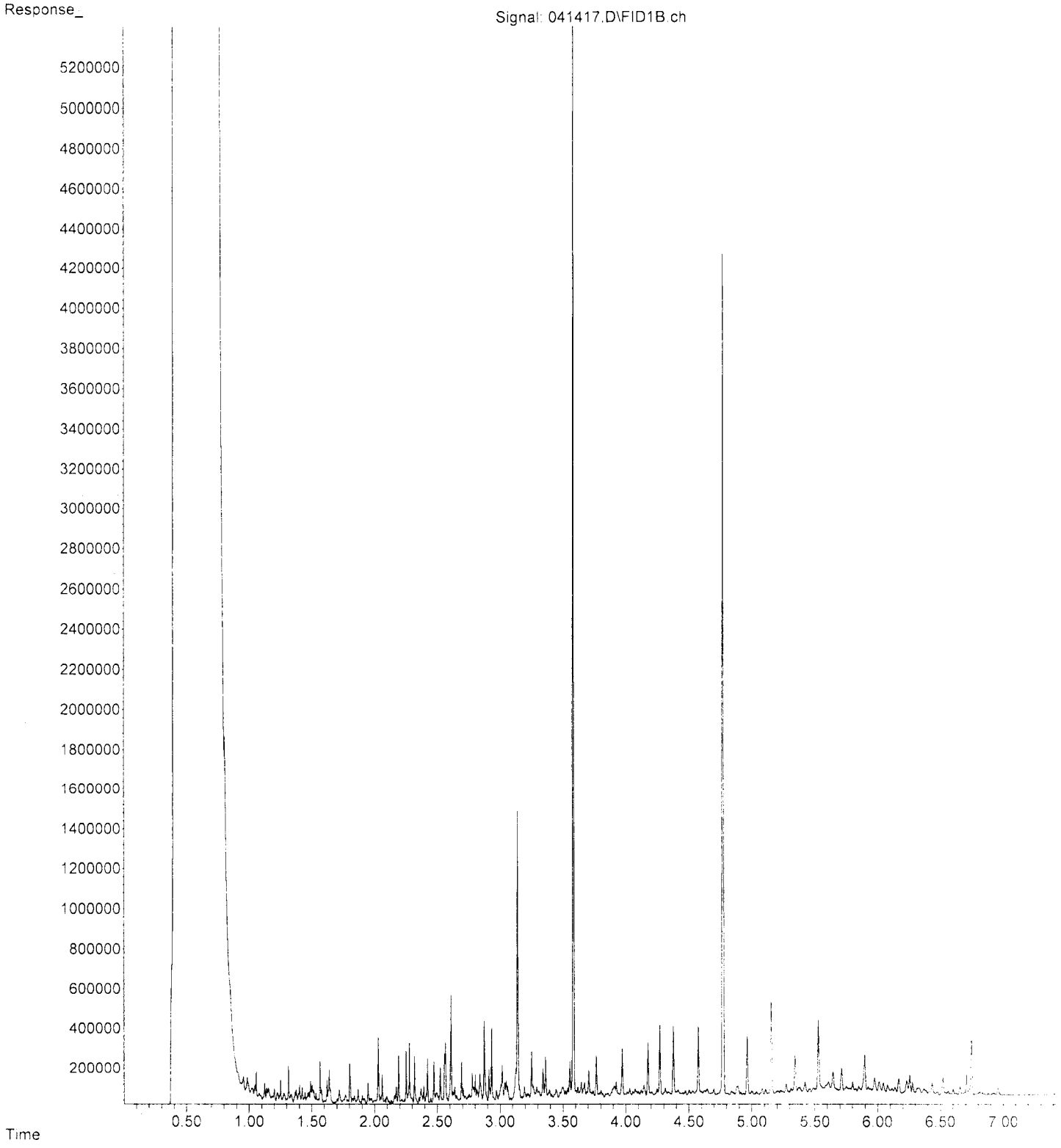
**SAMPLE DISPOSAL**
- [ ] Dispose after 30 days
- [ ] Archive Samples
- [ ] Other

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | TPH-HCID | TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by 8260C | SVOCs by 8270D | PAHs 8270D SIM | Total metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | Diss metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TA-DP-1-GW-10.0 | 61A-C | 4/13/23 | 0910 | W | 3 | | | | | | | | X | O | | | FF=field filtered LF=lab filtered |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | Samples received at | | | | | 10c |
| | | | | | | | | | | | | | | | | | |

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: Amanda Bixby | Amanda Bixby | MFA | 4/13/23 | 1200 |
| Received by: HONG NGUYEN | HONG NGUYEN | FBI | 4/13/23 | 11:30 |
| Relinquished by: | | | | |
| Received by: | | | | |

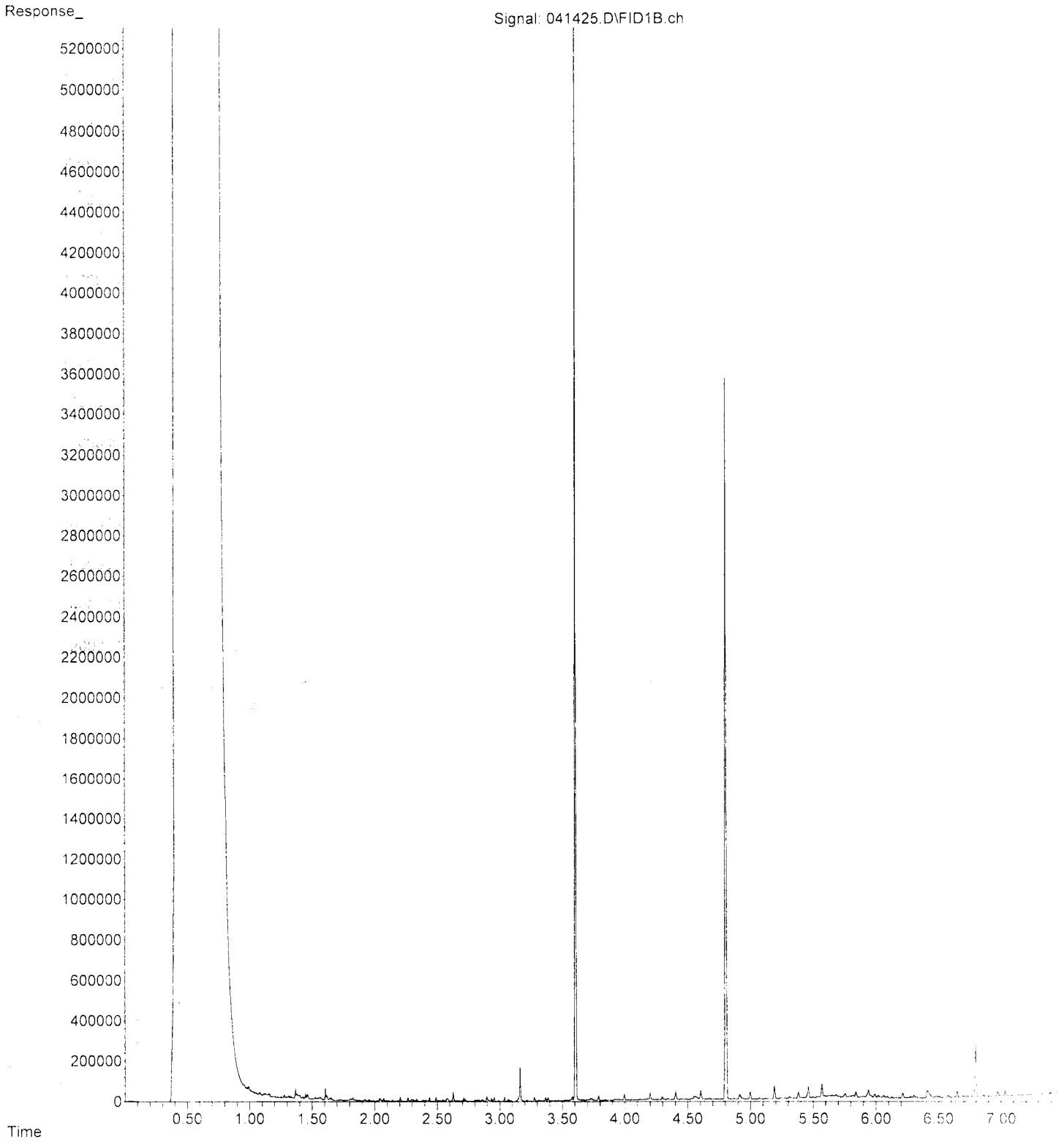
*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*

File :P:\Proc_GC14\04-14-23\041417.D
Operator : TL
Acquired : 14 Apr 2023 11:27 am using AcqMethod DX.M
Instrument : GC14
Sample Name: 304189-32
Misc Info : ERR
Vial Number: 19

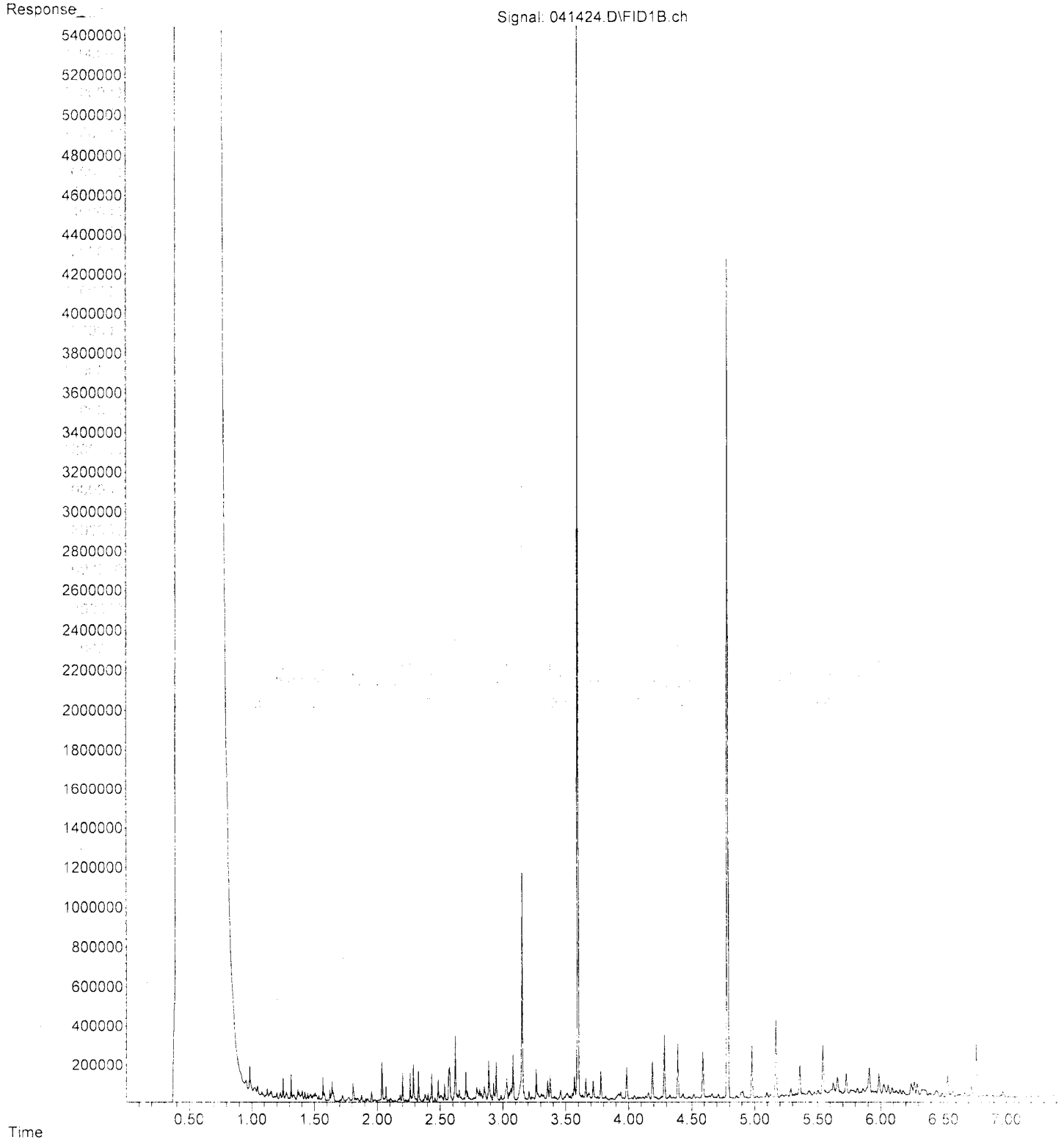


File :P:\Proc_GC14\04-14-23\041425.D
Operator : TL
Acquired : 14 Apr 2023 01:01 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 304189-36
Misc Info :
Vial Number: 21

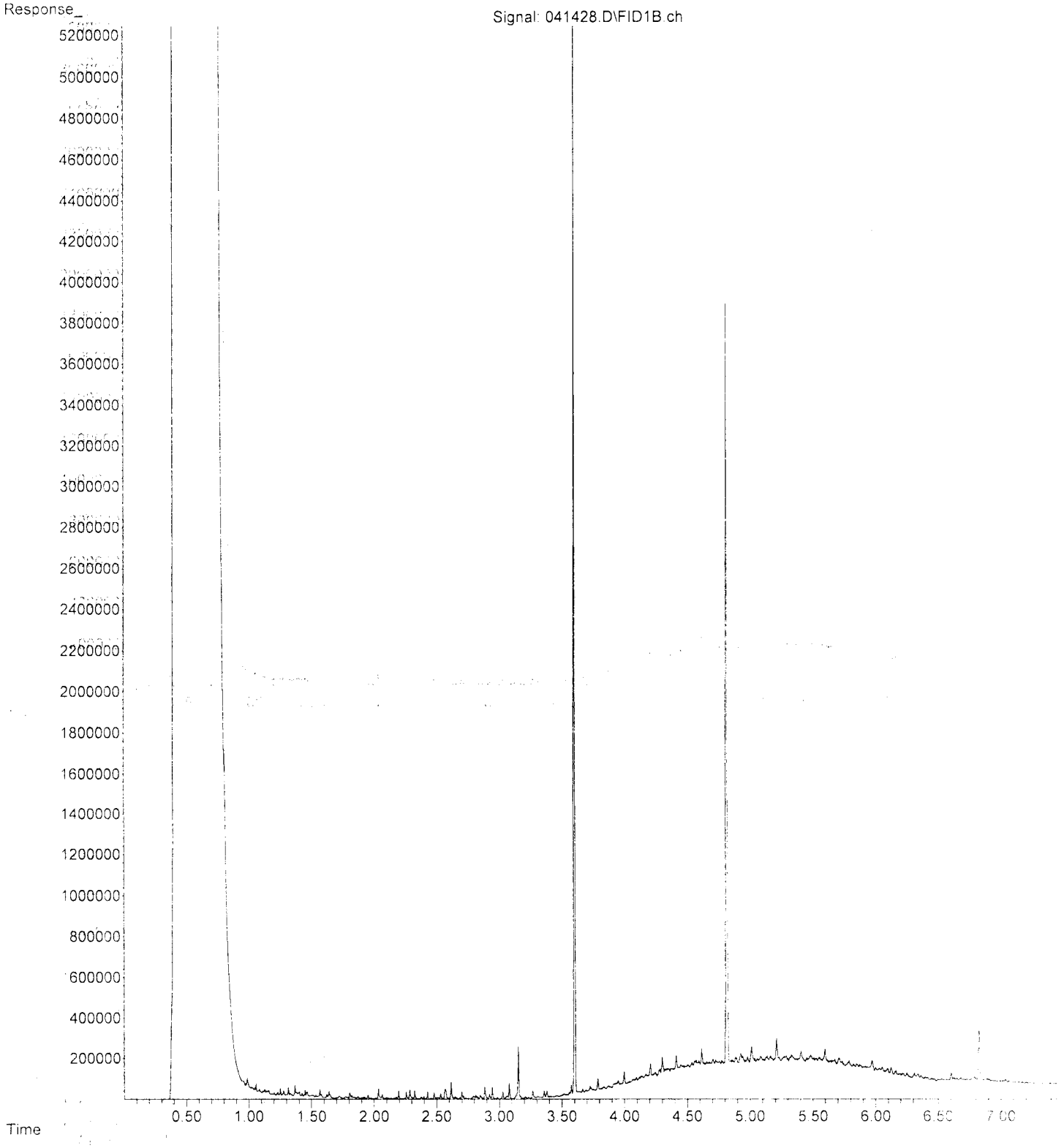
ERR



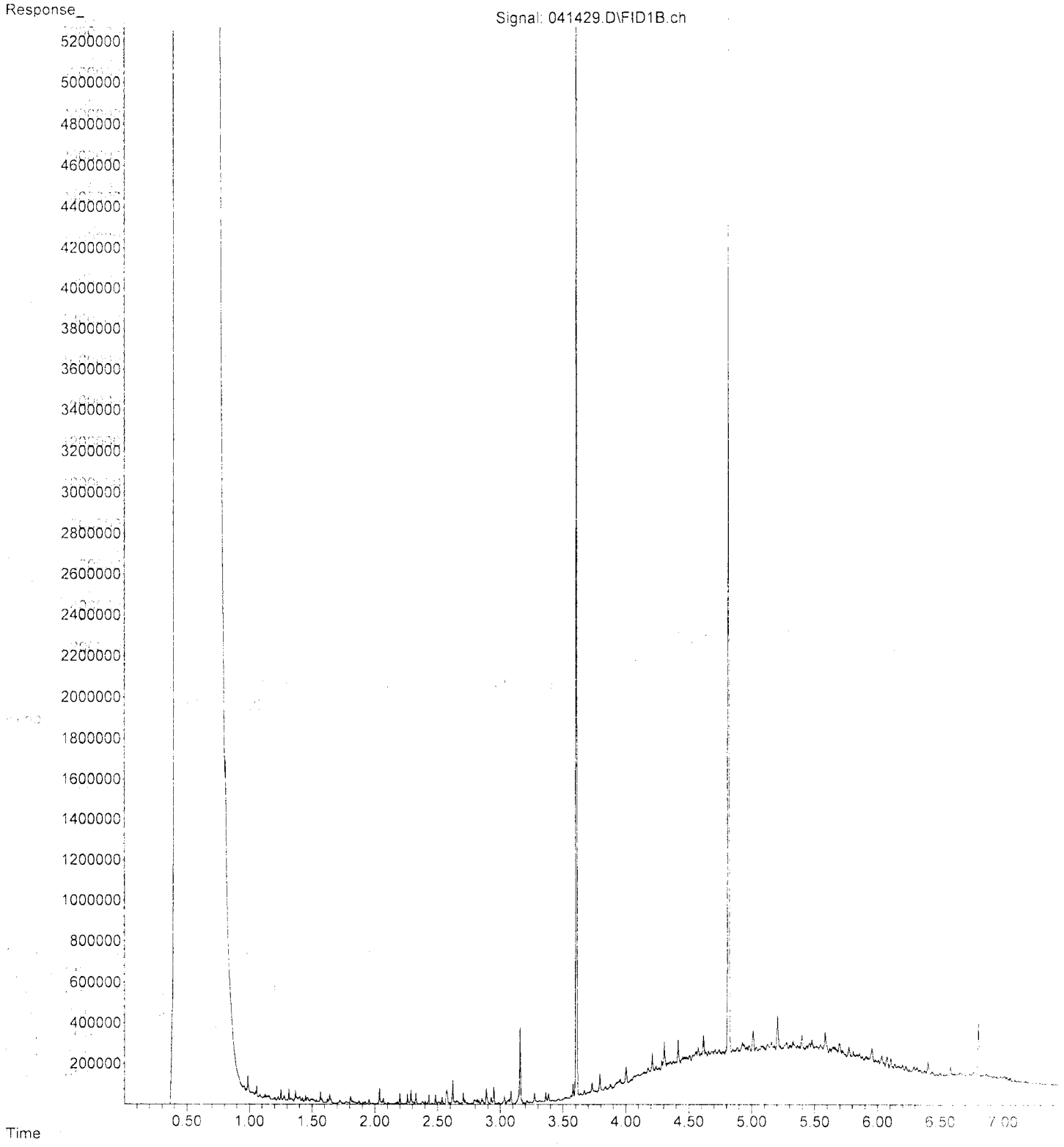
File :P:\Proc_GC14\04-14-23\041424.D
Operator : TL
Acquired : 14 Apr 2023 12:49 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 304189-39
Misc Info : ERR
Vial Number: 20



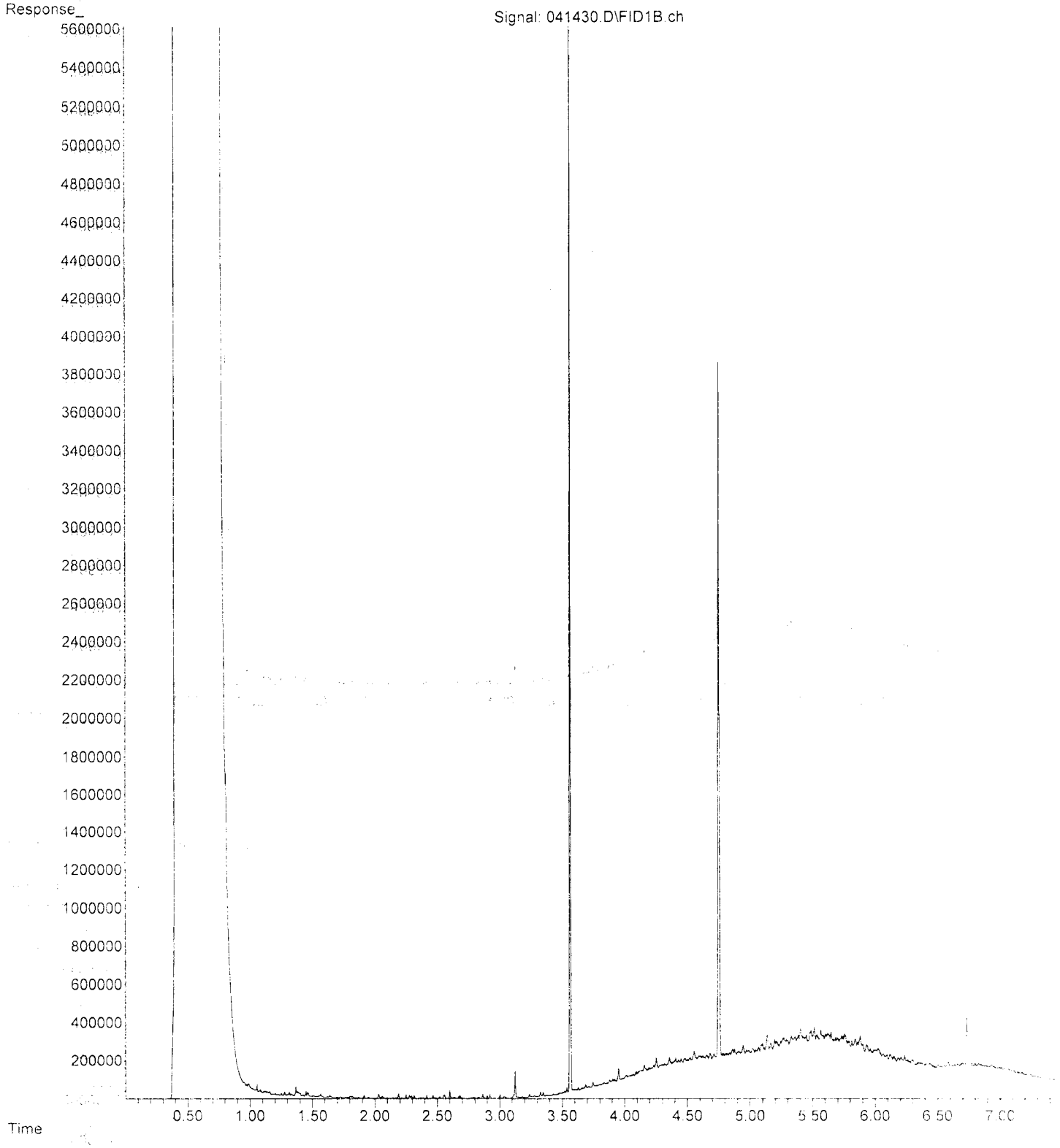
File : P:\Proc_GC14\04-14-23\041428.D
Operator : TL
Acquired : 14 Apr 2023 01:36 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 304189-41
Misc Info : ERR
Vial Number: 22



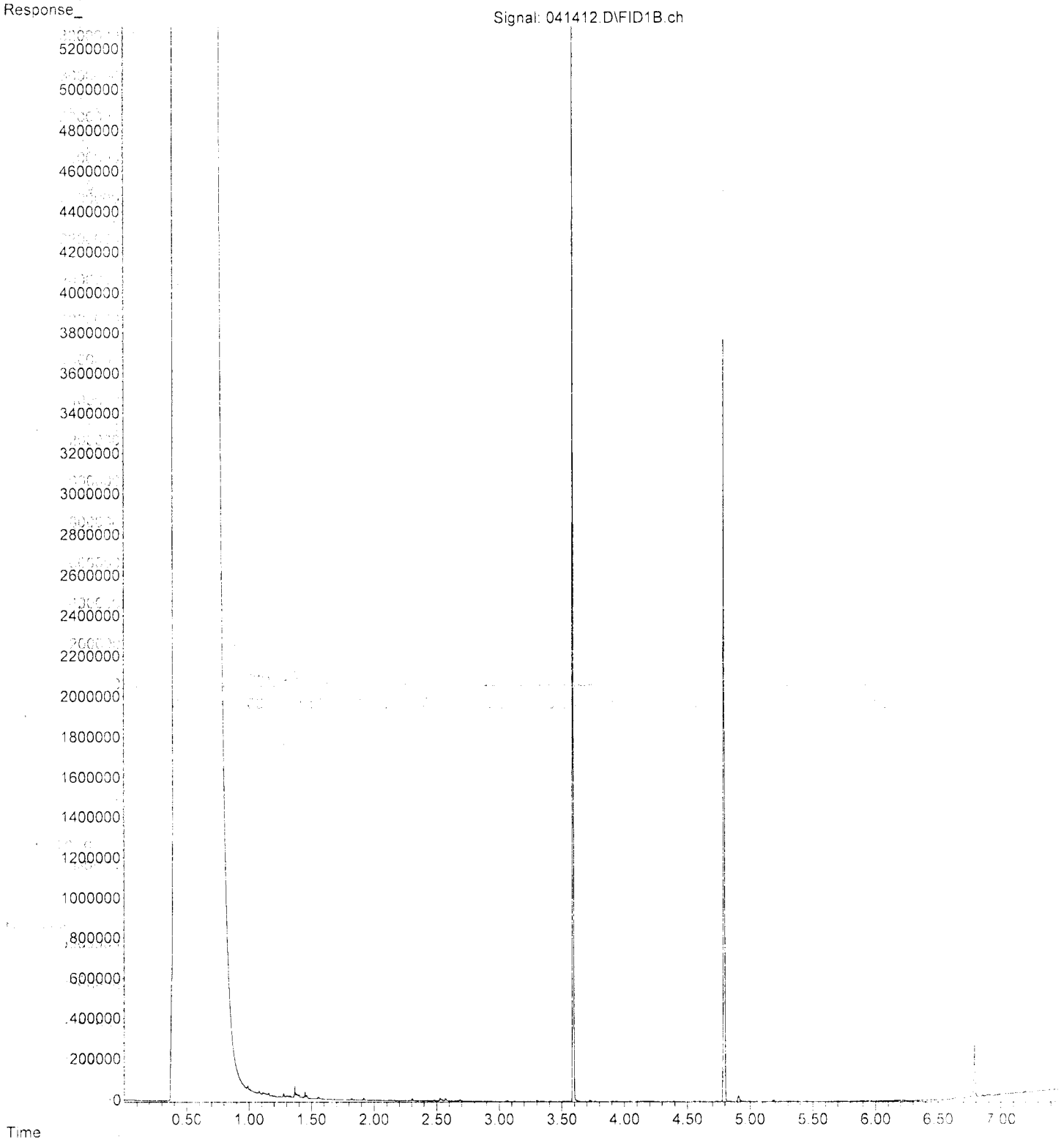
File :P:\Proc_GC14\04-14-23\041429.D
Operator : TL
Acquired : 14 Apr 2023 01:48 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 304189-42
Misc Info : ERR
Vial Number: 23



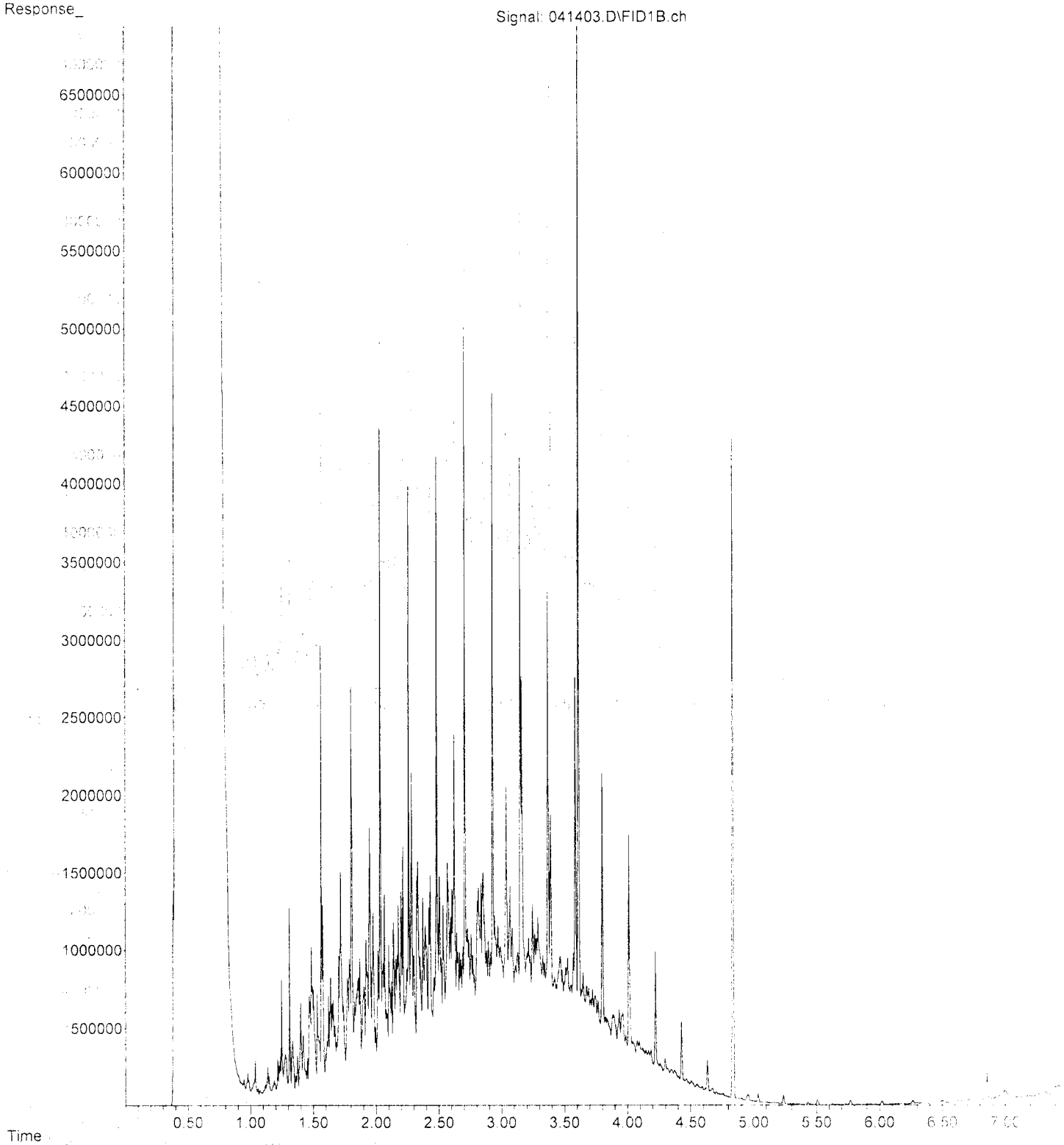
File :P:\Proc_GC14\04-14-23\041430.D
Operator : TL
Acquired : 14 Apr 2023 02:00 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 304189-45
Misc Info : ERR
Vial Number: 24



File : P:\Proc_GC14\04-14-23\041412.D
Operator : TL
Acquired : 14 Apr 2023 10:28 am using AcqMethod DX.M
Instrument : GC14
Sample Name: 03-904 mb
Misc Info : ERR
Vial Number: 14



File :P:\Proc_GC14\04-14-23\041403.D
Operator : TL
Acquired : 14 Apr 2023 08:43 am using AcqMethod DX.M
Instrument : GC14
Sample Name: 500 Dx 68-66F
Misc Info : ERR
Vial Number: 3



3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

**Friedman & Bruya**
Michael Erdahl
5500 4th Ave S
Seattle, WA 98108

**RE: 304189**
**Work Order Number: 2304439**

April 26, 2023

**Attention Michael Erdahl:**

Fremont Analytical, Inc. received 1 sample(s) on 4/19/2023 for the analyses presented in the following report.

***Hexavalent Chromium by EPA Method 7196***
***Sample Moisture (Percent Moisture)***

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,



Brianna Barnes
Project Manager

**Date:** *04/26/2023*

**CLIENT:** Friedman & Bruya
**Project:** 304189
**Work Order:** 2304439

# Work Order Sample Summary

| Lab Sample ID | Client Sample ID | Date/Time Collected | Date/Time Received |
|---|---|---|---|
| 2304439-001 | SP-DP-2-SB-0.5-DUP | 04/11/2023 1:30 PM | 04/19/2023 11:07 AM |

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

# Case Narrative

WO#: **2304439**
Date: **4/26/2023**

**CLIENT:** Friedman & Bruya
**Project:** 304189

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MCL - Maximum Contaminant Level
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

# Analytical Report

Work Order: **2304439**
Date Reported: **4/26/2023**

**CLIENT:** Friedman & Bruya
**Project:** 304189

**Lab ID:** 2304439-001 **Collection Date:** 4/11/2023 1:30:00 PM
**Client Sample ID:** **SP-DP-2-SB-0.5-DUP** **Matrix:** Soil

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **Sample Moisture (Percent Moisture)** | | | | Batch ID: R83321 | | Analyst: MP |
| Percent Moisture | 18.7 | 0.500 | | wt% | 1 | 4/20/2023 8:12:42 AM |
| **Hexavalent Chromium by EPA Method 7196** | | | | Batch ID: 40111 | | Analyst: ME |
| Chromium, Hexavalent | ND | 0.613 | | mg/Kg-dry | 1 | 4/26/2023 11:33:00 AM |

**Work Order:** 2304439
**CLIENT:** Friedman & Bruya
**Project:** 304189

# QC SUMMARY REPORT

## Hexavalent Chromium by EPA Method 7196

| Sample ID: **MB-40111** | SampType: **MBLK** | | | Units: **mg/Kg** | | Prep Date: **4/24/2023** | | RunNo: **83499** | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: **MBLKS** | Batch ID: **40111** | | | | | Analysis Date: **4/26/2023** | | SeqNo: **1739644** | | |
| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
| Chromium, Hexavalent | ND | 0.500 | | | | | | | | | |

| Sample ID: **LCS-40111** | SampType: **LCS** | | | Units: **mg/Kg** | | Prep Date: **4/24/2023** | | RunNo: **83499** | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: **LCSS** | Batch ID: **40111** | | | | | Analysis Date: **4/26/2023** | | SeqNo: **1739645** | | |
| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
| Chromium, Hexavalent | 2.40 | 0.500 | 2.500 | 0 | 95.9 | 88.3 | 113 | | | | |

| Sample ID: **2304439-001AMS** | SampType: **MS** | | | Units: **mg/Kg-dry** | | Prep Date: **4/24/2023** | | RunNo: **83499** | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: **SP-DP-2-SB-0.5-DUP** | Batch ID: **40111** | | | | | Analysis Date: **4/26/2023** | | SeqNo: **1739648** | | |
| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
| Chromium, Hexavalent | 2.89 | 0.609 | 3.046 | 0 | 94.8 | 22.6 | 133 | | | | |

| Sample ID: **2304439-001ADUP** | SampType: **DUP** | | | Units: **mg/Kg-dry** | | Prep Date: **4/24/2023** | | RunNo: **83499** | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: **SP-DP-2-SB-0.5-DUP** | Batch ID: **40111** | | | | | Analysis Date: **4/26/2023** | | SeqNo: **1739649** | | |
| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
| Chromium, Hexavalent | ND | 0.613 | | | | | | 0 | | 30 | |

| Sample ID: **2304439-001AMSD** | SampType: **MSD** | | | Units: **mg/Kg-dry** | | Prep Date: **4/24/2023** | | RunNo: **83499** | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: **SP-DP-2-SB-0.5-DUP** | Batch ID: **40111** | | | | | Analysis Date: **4/26/2023** | | SeqNo: **1739650** | | |
| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
| Chromium, Hexavalent | 2.85 | 0.613 | 3.064 | 0 | 93.2 | 22.6 | 133 | 2.886 | 1.11 | 30 | |

# Sample Log-In Check List

| | | | |
|---|---|---|---|
| Client Name: | FB | Work Order Number: | 2304439 |
| Logged by: | Morgan Wilson | Date Received: | 4/19/2023 11:07:00 AM |

## Chain of Custody

| | | | | |
|---|---|---|---|---|
| 1. | Is Chain of Custody complete? | Yes ☑ | No ☐ | Not Present ☐ |
| 2. | How was the sample delivered? | Client | | |

## Log In

| | | | | |
|---|---|---|---|---|
| 3. | Coolers are present? | Yes ☑ | No ☐ | NA ☐ |
| 4. | Shipping container/cooler in good condition? | Yes ☑ | No ☐ | |
| 5. | Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact) | Yes ☐ | No ☐ | Not Present ☑ |
| 6. | Was an attempt made to cool the samples? | Yes ☑ | No ☐ | NA ☐ |
| 7. | Were all items received at a temperature of >2°C to 6°C * | Yes ☑ | No ☐ | NA ☐ |
| 8. | Sample(s) in proper container(s)? | Yes ☑ | No ☐ | |
| 9. | Sufficient sample volume for indicated test(s)? | Yes ☑ | No ☐ | |
| 10. | Are samples properly preserved? | Yes ☑ | No ☐ | |
| 11. | Was preservative added to bottles? | Yes ☐ | No ☑ | NA ☐ |
| 12. | Is there headspace in the VOA vials? | Yes ☐ | No ☐ | NA ☑ |
| 13. | Did all samples containers arrive in good condition(unbroken)? | Yes ☑ | No ☐ | |
| 14. | Does paperwork match bottle labels? | Yes ☑ | No ☐ | |
| 15. | Are matrices correctly identified on Chain of Custody? | Yes ☑ | No ☐ | |
| 16. | Is it clear what analyses were requested? | Yes ☑ | No ☐ | |
| 17. | Were all holding times able to be met? | Yes ☑ | No ☐ | |

## Special Handling (if applicable)

| | | | | |
|---|---|---|---|---|
| 18. | Was client notified of all discrepancies with this order? | Yes ☐ | No ☐ | NA ☑ |

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

| Item # | Temp ºC |
|---|---|
| Sample | 3.8 |

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

# SUBCONTRACT SAMPLE CHAIN OF CUSTODY

2304439



Send Report To Michael Erdahl
Company Friedman and Bruya, Inc.
Address 3012 16th Ave W
City, State, ZIP Seattle, WA 98119
Phone # (206) 285-8282 merdahl@friedmanandbruya.com

| SUBCONTRACTER Fremont | |
|---|---|
| PROJECT NAME/NO. 304189 | PO # D-246 |
| REMARKS EQuIS 4 | |

TURNAROUND TIME
☒ Standard TAT
RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
Dispose after 30 days
Return samples
Will call with instructions



| Sample ID | Lab ID | Date Sampled | Time Sampled | Matrix | # of jars | ANALYSES REQUESTED: Hexavalent Chromium | | | | | | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SP-DP-2-SB-0.5-DUP | | 4/11/2023 | 1330 | soil | 1 | x | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: | Michael Erdahl | Friedman & Bruya | | |
| Received by: | FAI Alli Miller | | 4/19/23 | 1107 |
| Relinquished by: | | | | |
| Received by: | | | | |

*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*
*Fax (206) 283-5044*

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

5500 4th Avenue South
Seattle, WA 98108
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

May 19, 2023

Emily Hess, Project Manager
Maul Foster Alongi
2815 2nd Ave, Suite 540
Seattle, WA 98121

Dear Ms Hess:

Included is the amended reprot from the testing of material submitted on April 13, 2023 from the Forterra Roslyn M1122.05.003, F&BI 304189 project. Only the results for samples FO-DP-3-SB-0.5 and VM-DP-3-SB-0.5 are included in the report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Fiona Bellows
MFA0518R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

5500 4th Avenue South
Seattle, WA 98108
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

May 18, 2023

Emily Hess, Project Manager
Maul Foster Alongi
2815 2nd Ave, Suite 540
Seattle, WA 98121

Dear Ms Hess:

Included are the additional results from the testing of material submitted on April 13, 2023 from the Forterra Roslyn M1122.05.003, F&BI 304189 project. There are 6 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
MFA0518R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 13, 2023 by Friedman & Bruya, Inc. from the Maul Foster Alongi Forterra Roslyn M1122.05.003, F&BI 304189 project. Samples were logged in under the laboratory ID's listed below.

| Laboratory ID | Maul Foster Alongi |
|---|---|
| 304189 -01 | SP-DP-2-SB-0.5 |
| 304189 -02 | SP-DP-2-SB-0.5-DUP |
| 304189 -03 | SP-DP-2-SB-2.5 |
| 304189 -04 | SP-DP-2-SB-7.0 |
| 304189 -05 | SP-DP-2-SB-14.5 |
| 304189 -06 | SP-DP-3-SB-0.5 |
| 304189 -07 | SP-DP-3-SB--0.5-DUP |
| 304189 -08 | SP-DP-3-SB-2.5 |
| 304189 -09 | SP-DP-3-SB-7.5 |
| 304189 -10 | SP-DP-3-SB-14.5 |
| 304189 -11 | SP-DP-1-SB-0.5 |
| 304189 -12 | SP-DP-1-SB-2.5 |
| 304189 -13 | FO-DP-4-SB-0.5 |
| 304189 -14 | FO-DP-4-SB-2.5 |
| 304189 -15 | FO-DP-4-SB-8.5 |
| 304189 -16 | FO-DP-2-SB-0.5 |
| 304189 -17 | FO-DP-2-SB-2.5 |
| 304189 -18 | FO-DP-3-SB-0.5 |
| 304189 -19 | FO-DP-3-SB-2.5 |
| 304189 -20 | FO-DP-1-SB-1.0 |
| 304189 -21 | FO-DP-1-SB-2.5 |
| 304189 -22 | VM-DP-4-SB-0.5 |
| 304189 -23 | VM-DP-4-SB-2.5 |
| 304189 -24 | SP-DP-2-GW-15.0 |
| 304189 -25 | SP-DP-2-GW-15.0-DUP |
| 304189 -26 | VM-DP-3-SB-0.5 |
| 304189 -27 | VM-DP-3-SB-2.5 |
| 304189 -28 | VM-DP-2-SB-0.5 |
| 304189 -29 | VM-DP-2-SB-2.5 |
| 304189 -30 | VM-DP-1-SB-0.5 |
| 304189 -31 | VM-DP-1-SB-2.5 |
| 304189 -32 | PH-DP-4-SB-0.5 |
| 304189 -33 | PH-DP-4-SB-2.5 |
| 304189 -34 | PH-DP-4-SB-7.5 |
| 304189 -35 | PH-DP-4-SB-13.5 |
| 304189 -36 | PH-DP-2-SB-0.5 |

CASE NARRATIVE

| Laboratory ID | Maul Foster Alongi |
|---|---|
| 304189 -37 | PH-DP-2-SB-0.5-DUP |
| 304189 -38 | PH-DP-2-SB-2.5 |
| 304189 -39 | PH-DP-1-SB-1.5 |
| 304189 -40 | PH-DP-1-SB-2.5 |
| 304189 -41 | PH-DP-5-SB-0.8 |
| 304189 -42 | PH-DP-5-SB-0.8-DUP |
| 304189 -43 | PH-DP-5-SB-2.3 |
| 304189 -44 | PH-DP-4-GW-10.0 |
| 304189 -45 | PH-DP-3-SB-0.8 |
| 304189 -46 | PH-DP-3-SB-2.5 |
| 304189 -47 | TF-DP-2-SB-0.5 |
| 304189 -48 | TF-DP-2-SB-2.5 |
| 304189 -49 | TF-DP-1-SB-1.0 |
| 304189 -50 | TF-DP-1-SB-3.0 |
| 304189 -51 | WL-DP-4-SB-0.5 |
| 304189 -52 | WL-DP-4-SB-4.0 |
| 304189 -53 | WL-DP-1-SB-0.5 |
| 304189 -54 | WL-DP-1-SB-0.5-DUP |
| 304189 -55 | WL-DP-1-SB-8.0 |
| 304189 -56 | WL-DP-3-SB-0.5 |
| 304189 -57 | WL-DP-3-SB-2.0 |
| 304189 -58 | WL-DP-3-SB-7.0 |
| 304189 -59 | WL-DP-SB-0.3 |
| 304189 -60 | WL-DP-SB-13.0 |
| 304189 -61 | TA-DP-1-GW-10.0 |

All quality control requirements were acceptable.

## Analysis for TCLP Metals By EPA Method 6020 and 1311

| | | | |
|---|---|---|---|
| Client ID: | FO-DP-3-SB-0.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 05/17/23 | Lab ID: | 304189-18 |
| Date Analyzed: | 05/18/23 | Data File: | 304189-18.083 |
| Matrix: | Soil/Solid | Instrument: | ICPMS2 |
| Units: | mg/L (ppm) | Operator: | SP |

| Analyte: | Concentration mg/L (ppm) | TCLP Limit |
|---|---|---|
| Lead | <1 | 5.0 |

## Analysis for TCLP Metals By EPA Method 6020B and 1311

| | | | |
|---|---|---|---|
| Client ID: | VM-DP-3-SB-0.5 | Client: | Maul Foster Alongi |
| Date Received: | 04/13/23 | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 05/11/23 | Lab ID: | 304189-26 |
| Date Analyzed: | 05/12/23 | Data File: | 304189-26.064 |
| Matrix: | Soil/Solid | Instrument: | ICPMS2 |
| Units: | mg/L (ppm) | Operator: | SP |

| Analyte: | Concentration mg/L (ppm) | TCLP Limit |
|---|---|---|
| Lead | <1 | 5.0 |

## Analysis for TCLP Metals By EPA Method 6020B and 1311

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Maul Foster Alongi |
| Date Received: | Not Applicable | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 05/11/23 | Lab ID: | I3-379 mb |
| Date Analyzed: | 05/12/23 | Data File: | I3-379 mb.044 |
| Matrix: | Soil/Solid | Instrument: | ICPMS2 |
| Units: | mg/L (ppm) | Operator: | SP |

| Analyte: | Concentration mg/L (ppm) | TCLP Limit |
|---|---|---|
| Lead | <1 | 5.0 |

## Analysis for TCLP Metals By EPA Method 6020 and 1311

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Maul Foster Alongi |
| Date Received: | Not Applicable | Project: | Forterra Roslyn M1122.05.003 |
| Date Extracted: | 05/17/23 | Lab ID: | I3-395 mb |
| Date Analyzed: | 05/18/23 | Data File: | I3-395 mb.082 |
| Matrix: | Soil/Solid | Instrument: | ICPMS2 |
| Units: | mg/L (ppm) | Operator: | SP |

| Analyte: | Concentration mg/L (ppm) | TCLP Limit |
|---|---|---|
| Lead | <1 | 5.0 |

Date of Report: 05/18/23
Date Received: 04/13/23
Project: Forterra Roslyn M1122.05.003, F&BI 304189

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL/SOLID SAMPLES FOR TCLP METALS USING EPA METHODS 6020B AND 1311

Laboratory Code: 304189-18 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Lead | mg/L (ppm) | 1.0 | <1 | 77 | 76 | 75-125 | 1 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Lead | mg/L (ppm) | 1.0 | 81 | 80-120 |

Date of Report: 05/18/23
Date Received: 04/13/23
Project: Forterra Roslyn M1122.05.003, F&BI 304189

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL/SOLID SAMPLES FOR TCLP METALS USING EPA METHODS 6020B AND 1311

Laboratory Code: 305202-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Lead | mg/L (ppm) | 1.0 | <1 | 89 | 89 | 75-125 | 0 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Lead | mg/L (ppm) | 1.0 | 93 | 80-120 |

# Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the standard reporting limit. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

304189

# SAMPLE CHAIN OF CUSTODY 4/13/23 C3/J3/M4

Page # 1 of 7

Report To Emily Hess
Company Maul Foster & Alongi, Inc.
Address 109 E 13th St
City, State, ZIP Vancouver, WA 98660
Phone (360) 980-2997 Email ehess@maulfoster.com

SAMPLERS (signature): Amanda Bixby
PROJECT NAME: Forterra Roslyn
PO #: M1122.05.003
REMARKS: X = analyze. O = hold.
INVOICE TO: accounting@maulfoster.com

TURNAROUND TIME
☒ Standard Turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Archive Samples
☐ Other

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | TPH-HCID | TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by 8260C | SVOCs by 8270D | PAHs 8270D SIM | Total metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | Diss metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | CAT | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SP-DP-2-SB-0.5 | 01 | 4/11/23 | 1330 | S | 1 | | | | | | | | X | | | MS/MSD |
| SP-DP-2-SB-0.5-DUP | 02 | 4/11/23 | 1330 | S | 1 | | | | | | | | X | | ● | |
| SP-DP-2-SB-2.5 | 03 | 4/11/23 | 1335 | S | 1 | | | | | | | | O | | | |
| SP-DP-2-SB-7.0 | 04 | 4/11/23 | 1340 | S | 1 | | | | | | | | O | | | |
| SP-DP-2-SB-14.5 | 05 | 4/11/23 | 1345 | S | 1 | | | | | | | | O | | | |
| SP-DP-3-SB-0.5 | 06 | 4/11/23 | [illegible] | S | 1 | | | | | | | | X | | | |
| SP-DP-3-SB-0.5-DUP | 07 | 4/11/23 | [illegible] | S | 1 | | | | | | | ● | O | | | |
| SP-DP-3-SB-2.5 | 08 | 4/11/23 | 1415 | S | 1 | | | | | | | ● | O | | | |
| SP-DP-3-SB-7.5 | 09 | 4/11/23 | 1420 | S | 1 | | | | | | | | O | | | |
| SP-DP-3-SB-14.5 | 10 | 4/11/23 | 1425 | S | 1 | | | | | | | | O | | | |

ANALYSES REQUESTED

● per EH 4/18/23 mE

◆ per EH 5/10/23 mE

| | SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|---|
| Relinquished by: | Amanda Bixby | Amanda Bixby | MFA | 4/13/23 | 1200 |
| Received by: | Hongyu | HONGYU GUO | FBR | 4/13/23 | 11:30 |
| Relinquished by: | | | | | |
| Received by: | | | | | |

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

304189

# SAMPLE CHAIN OF CUSTODY 4/13/23 03/J31M4

Page # 2 of 7

Report To Emily Hess
Company Maul Foster & Alongi, Inc.
Address 109 E 13th St
City, State, ZIP Vancouver, WA 98660
Phone (360) 980-2497 Email ehess@maulfoster.com

SAMPLERS (signature)

PROJECT NAME: Forterra Roslyn
PO#: M1122.05.003

REMARKS: X = analyze. O = hold.
INVOICE TO: accounting@maulfoster.com

TURNAROUND TIME
- ☒ Standard Turnaround
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Archive Samples
- ☐ Other

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | TPH-HCID | TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by 8260C | SVOCs by 8270D | cPAHs by 8270D SIM | Total Metals (As, Cd, Cr, Cu, Pb, Hg, Zn, Ni) | Diss Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | TCLP Lead | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SP-DP-1-SB-0.5 | 11 | 4/11/23 | 1440 | S | 1 | | | | | | | | X | | | | |
| SP-DP-1-SB-2.5 | 12 | 4/11/23 | 1445 | S | 1 | | | | | | | | O | | | | |
| Fo-DP-4-SB-0.5 | 13 | 4/11/23 | 1520 | S | 1 | | | | | | | | X | | | | |
| Fo-DP-4-SB-2.5 | 14 | 4/11/23 | 1525 | S | 1 | | | | | | | | O | | | | |
| Fo-DP-4-SB-8.5 | 15 | 4/11/23 | 1530 | S | 1 | | | | | | | | O | | | | |
| FO-DP-2-SB-0.5 | 16 | 4/11/23 | 1550 | S | 1 | | | | | | | | X | | | | |
| Fo-DP-2-SB-2.5 | 17 | 4/11/23 | 1555 | S | 1 | | | | | | | | O | | | | |
| Fo-DP-3-SB-0.5 | 18 | 4/11/23 | 1610 | S | 1 | | | | | | | | X | | ⊗ | | per EH 5/10/23 |
| Fo-DP-3-SB-2.5 | 19 | 4/11/23 | 1615 | S | 1 | | | | | | | ● | O | | ◆ | | ns |
| Fo-DP-1-SB-1.0 | 20 | 4/11/23 | 1650 | S | 1 | | | | | | | | X | | | | |

ANALYSES REQUESTED

| | SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|---|
| Relinquished by: | | Amanda Bixby | MFA | 4/13/23 | 1200 |
| Received by: | | HONG NGUYEN | FBA | 4/13/23 | 11:30 |
| Relinquished by: | | | | | |
| Received by: | | | Samples received at | °C | |

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

304189

# SAMPLE CHAIN OF CUSTODY 4/13/23 C3/J3/M4

Page # 3 of 7

Report To Emily Hess
Company Maul Foster & Alongi, Inc.
Address 109 E 13th St
City, State, ZIP Vancouver, WA 98660
Phone (360) 980-2497 Email ehess@maulfoster.com

SAMPLERS (signature) [signature]
PROJECT NAME: Forterra Roslyn
PO #: M1122.05.003
REMARKS: X = analyze. O = hold.
INVOICE TO: accounting@maulfoster.com

TURNAROUND TIME
☒ Standard Turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Archive Samples
☐ Other

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | TPH-HCID | TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by 8260C | SVOCs by 8270D | PAHs 8270D SIM | As, Cd, Cr, Pb total metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | Diss metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | TCLP Lead | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FO-DP-1-SB-2.5 | 21 | 4/11/23 | 1655 | S | 1 | | | | | | | | O | | | | ● Cr, As, Pb only |
| VM-DP-4-SB-0.5 | 22 | 4/11/23 | 1710 | S | 1 | | | | | | | | X | | | | LF+FF, Both Fractions |
| VM-DP-4-SB-2.5 | 23 | 4/11/23 | 1715 | S | 1 | | | | | | | | O | | | | |
| SP-DP-2-GW-15.0 | 24 A-F | 4/12/23 | 0800 | W | 6 | | | | | | | | X | ● | | | FF = field filtered MS/<br>LF = lab filter MSD |
| SP-DP-2-GW-15.0-DUP | 25 A-C | 4/12/23 | 0800 | W | 3 | | | | | | | | X | ● | | | FF = field filter<br>LF = lab filter |
| VM-DP-3-SB-0.5 | 26 | 4/12/23 | 0920 | S | 1 | | | | | | | | X | | ◆ | | |
| VM-DP-3-SB-2.5 | 27 | 4/12/23 | 0925 | S | 1 | | | | | | | ● | O | | | | |
| VM-DP-2-SB-0.5 | 28 | 4/12/23 | 0950 | S | 1 | | | | | | | | X | | | | |
| VM-DP-2-SB-2.5 | 29 | 4/12/23 | 0955 | S | 1 | | | | | | | | O | | | | |
| VM-DP-1-SB-0.5 | 30 | 4/12/23 | 1010 | S | 1 | | | | | | | | X | | | | |

| | SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|---|
| Relinquished by: | [signature] | Amanda Bixby | MFA | 4/13/23 | 1200 |
| Received by: | [signature] | HONG NGUYEN | FPD | 4/13/23 | 11:30 |
| Relinquished by: | | | | | |
| Received by: | | | Samples received at 1 °C | | |


Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

304189

# SAMPLE CHAIN OF CUSTODY 4/13/23

C5/J3/M4

Page # 4 of 7

Report To Emily Hess
Company Maul Foster & Alongi, Inc.
Address 109 E 13th St
City, State, ZIP Vancouver, WA 98660
Phone (360) 980-2497 Email ehess@maulfoster.com

SAMPLERS (*signature*)

PROJECT NAME: Forterra Roslyn
PO#: M1122.05.003

REMARKS
X=analyze.
O=hold.
Project specific RLs? - Yes / No

INVOICE TO: accounting@maulfoster.com

TURNAROUND TIME
☒ Standard turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | ANALYSES REQUESTED: NWTPH-Dx | NWTPH-Gx | BTEX EPA 8021 | NWTPH-HCID | VOCs EPA 8260 | PAHs EPA 8270 | PCBs EPA 8082 As | Total metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | Diss. Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VM-DP-1-SB-2.5 | 31 | 4/12/23 | 1015 | S | 1 | | | | | | | | O | | | | |
| PH-DP-4-SB-0.5 | 32 | 4/12/23 | 1140 | S | 1 | X | | | | | | | X | | | | MS/MSD Hold |
| PH-DP-4-SB-2.5 | 33 | 4/12/23 | 1145 | S | 1 | O | | | | | | ● | O | | | | |
| PH-DP-4-SB-7.5 | 34 | 4/12/23 | 1150 | S | 1 | O | | | | | | | O | | | | |
| PH-DP-4-SB-13.5 | 35 | 4/12/23 | 1155 | S | 1 | O | | | | | | | O | | | | |
| PH-DP-2-SB-0.5 | 36 | 4/12/23 | 1220 | S | 1 | X | | | | | | | X | | | | |
| PH-DP-2-SB-0.5-DUP | 37 | 4/12/23 | 1220 | S | 1 | O | | | | | | | O | | | | |
| PH-DP-2-SB-2.5 | 38 | 4/12/23 | 1225 | S | 1 | O | | | | | | | O | | | | |
| PH-DP-1-SB-1.5 | 39 | 4/12/23 | 1240 | S | 1 | X | | | | | | | X | | | | MS/MSD |
| PH-DP-1-SB-2.5 | 40 | 4/12/23 | 1245 | S | 1 | O | | | | | | | O | | | | |

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: | Amanda Bixby | MFA | 4/13/23 | 1200 |
| Received by: | HONG NGUYEN | FBI | 4/13/23 | 11:30 |
| Relinquished by: | | Samples received at 1 °C | | |
| Received by: | | | | |

*Friedman & Bruya, Inc.*
*Ph. (206) 285-8282*

304189

# SAMPLE CHAIN OF CUSTODY ~~ATL~~ 4/13/23 C3/J3/M4



Report To Emily Hess
Company Maul Foster & Alongi, Inc.
Address 109 E 13th St
City, State, ZIP Vancouver, WA 98660
Phone (360)980-2497 Email ehess@maulfoster.com

SAMPLERS (*signature*): Amanda Birby

PROJECT NAME: Forterra Roslyn

PO #: M1122.05.003

REMARKS
X=analyze.
O=hold.
Project specific RLs? - Yes / No

INVOICE TO: accounting@maulfoster.com

TURNAROUND TIME
☒ Standard turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | ANALYSES REQUESTED: NWTPH-Dx | NWTPH-Gx | BTEX EPA 8021 | NWTPH-HCID | VOCs EPA 8260 | ~~PAHs~~ Cp ~~DRA 8270~~ | ~~PCBs~~ As ~~DRA 8082~~ | Total metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | Dissolved metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PH-DP-5-SB-0.8 | 41 | 4/12/23 | 1310 | S | 1 | X | | | | | | | X | | | | |
| PH-DP-5-SB-0.8-DUP | 42 | 4/12/23 | 1310 | S | 1 | X | | | | | | | X | | | | |
| PH-DP-5-SB-2.3 | 43 | 4/12/23 | 1315 | S | 1 | O | | | | | | | O | | | | |
| PH-DP-4-GW-10.0 | 44A-C | 4/12/23 | 1400 | W | 3 | ● | | | | | | | X | O | | | FF=field filtered<br>LF=lab filtered |
| PH-DP-3-SB-0.8 | 45 | 4/12/23 | 1410 | S | 1 | X | | | | | | | X | | | | |
| PH-DP-3-SB-2.5 | 46 | 4/12/23 | 1415 | S | 1 | O | | | | | | | O | | | | |
| TF-DP-2-SB-0.5 | 47 | 4/12/23 | 1430 | S | 1 | | | | | | | | X | | | | |
| TF-DP-2-SB-2.5 | 48 | 4/12/23 | 1435 | S | 1 | | | | | | | ● | O | | | | |
| TF-DP-1-SB-1.0 | 49 | 4/12/23 | 1450 | S | 1 | | | | | | | | X | | | | |
| TF-DP-1-SB-3.0 | 50 | 4/12/23 | 1455 | S | 1 | | | | | | ● | ● | O | | | | Samples received at 1 °C |

| | SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|---|
| Relinquished by: | Amanda Birby | Amanda Birby | MFA | 4/13/23 | 1700 |
| Received by: | HONG NGUYEN | HONG NGUYEN | FBS | 4/13/23 | 11:30 |
| Relinquished by: | | | | | |
| Received by: | | | | | |

*Friedman & Bruya, Inc.*
*Ph. (206) 285-8282*

304189

# SAMPLE CHAIN OF CUSTODY

4/13/23

C3/J3/M4

Page # 6 of 7

Report To Emily Hess

Company Mavi Foster & Along

Address 109 E 13th St

City, State, ZIP Vancouver, WA 98660

Phone (360) 980-2497 Email ehess@mavifoster.com

SAMPLERS (signature)

PROJECT NAME: Forterra Roslyn

PO #: M1122.05.003

REMARKS: X=analyze. O=hold.

INVOICE TO: accounting@mavifoster.com

TURNAROUND TIME
- ☒ Standard Turnaround
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Archive Samples
- ☐ Other

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | TPH-HCID | TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by 8260C | SVOCs by 8270D | PAHs 8270D SIM | total metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | dissolved metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WL-DP-4-SB-0.5 | 51 | 4/12/23 | 1510 | S | 1 | | | | | | | | X | | | | |
| WL-DP-4-SB-4.0 | 52 | 4/12/23 | 1515 | S | 1 | | | | | | | | O | | | | |
| WL-DP-1-SB-0.5 | 53 | 4/12/23 | 1530 | S | 1 | | | | | | | | X | | | | |
| WL-DP-1-SB-0.5-DUP | 54 | 4/12/23 | 1530 | S | 1 | | | | | | | | X | | | | |
| WL-DP-1-SB-8.0 | 55 | 4/12/23 | 1535 | S | 1 | | | | | | | | O | | | | |
| WL-DP-3-SB-0.5 | 56 | 4/12/23 | 1600 | S | 1 | | | | | | | | X | | | | |
| WL-DP-3-SB-2.0 | 57 | 4/12/23 | 1605 | S | 1 | | | | | | | | O | | | | |
| WL-DP-3-SB-7.0 | 58 | 4/12/23 | 1610 | S | 1 | | | | | | | | O | | | | |
| WL-DP2-SB-0.3 | 59 | 4/12/23 | 1640 | S | 1 | | | | | | | | X | | | | |
| WL-DP2-SB-13.0 | 60 | 4/12/23 | 1645 | S | 1 | | | | | | | | O | | | | Samples received at 1°C |

PV EH 4/18/23 NC


Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282


| | SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|---|
| Relinquished by: | | Amanda Bixby | MFA | 4/13/23 | 1200 |
| Received by: | | HONG NGUYEN | FBI | 4/13/23 | 11:30 |
| Relinquished by: | | | | | |
| Received by: | | | | | |

304189

# SAMPLE CHAIN OF CUSTODY

4/13/23 C3/J3/M4

Page # 7 of 7

Report To Emily Hess
Company Maul Foster & Alongi, Inc
Address 909 E 13th St
City, State, ZIP Vancouver, WA 98660
Phone (360) 910-2497 Email ehess@maulfoster.com

| SAMPLERS (signature) | |
|---|---|
| PROJECT NAME: Forterra Roslyn | PO #: M1122.05.003 |
| REMARKS: X=analyze. O=hold. | INVOICE TO: accounting@maulfoster.com |

**TURNAROUND TIME**
☒ Standard Turnaround
☐ RUSH
Rush charges authorized by:

**SAMPLE DISPOSAL**
☐ Dispose after 30 days
☐ Archive Samples
☐ Other

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | TPH-HCID | TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by 8260C | SVOCs by 8270D | PAHs 8270D SIM | Total metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | Diss metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TA-DP-1-GW-10.0 | 61A-C | 4/13/23 | 0910 | W | 3 | | | | | | | | X | O | | | FF=field filtered LF=lab filtered |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | Samples received at 1°C |
| | | | | | | | | | | | | | | | | | |

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: | Amanda Bixby | MFA | 4/13/23 | 1200 |
| Received by: | HONG NGUYEN | FBI | 4/13/23 | 11:30 |
| Relinquished by: | | | | |
| Received by: | | | | |

*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*