

Data Summary Report for Shoreline Sediments Near the Panhandle Smelting and Refining Company, Ponderay, ID

FINAL



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Alta
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Acronyms and Abbreviations

ABCA	Analysis of Brownfields Cleanup Alternatives
Alta	Alta Science & Engineering, Inc.
APN	Assessor Parcel Number
ARPA	American Rescue Plan Act
As	Arsenic
bgs	below ground surface
BNSF	Burlington Northern and Santa Fe
Cd	Cadmium
COC	constituent of concern
DQO	data quality objective
ESA	Environmental Site Assessment
Hg	Mercury
HNO ₃	nitric acid
IDEQ	Idaho Department of Environmental Quality
MS	matrix spike
MSD	matrix spike duplicate
Pb	Lead
PSRC	Panhandle Smelting and Refining Company
QA	quality assurance
QC	quality control
QAO	quality assurance officer
QAPP	Quality Assurance Project Plan
ROW	right-of-way
RPD	relative percent difference
RSL	Regional Screening Level
SVL	SVL Analytical
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
XRF	X-ray Fluorescence
Zn	Zinc

Units

mL	milliliter
mg/kg	milligram per kilogram

Section 1 Introduction

In September 2019, the City of Ponderay (the City) entered into a Brownfields Multipurpose Cooperative Agreement with the U.S. Environmental Protection Agency (USEPA) to clean up the former Panhandle Smelting and Refining Company (PSRC) (the Site). Because of past smelting activities, the Site soils contain elevated levels of lead (Pb) and other metals that present potential impacts to human health (e.g., Site users) and the environment.

However, due to the Covid pandemic, the assessment and cleanup of the PSRC was delayed by several years. At the end of 2022, Alta Science & Engineering, Inc. (Alta) provided an engineering opinion of probable cost of between \$2.4 million to \$3.7 million for the cleanup of the PSRC, which includes the development of an onsite repository, excavation of contaminated sediments and soils, and encapsulation of the slag pile. The engineering opinion of probable costs indicated a significant funding shortfall between estimated cleanup costs and available USEPA Brownfields Grant funds.

Due to this funding shortfall, the Idaho Department of Environmental Quality (IDEQ) and the City identified specific activities necessary to support assessment and cleanup of the PSRC that could be completed with American Rescue Plan Act (ARPA) funding available through the State of Idaho. These activities include the assessment and cleanup of the slag pile (located within Pend d'Orielle Bay Trail, Zone 4, Property 11) and the surrounding beach/shoreline area.

In preparation for cleanup of the PSRC, the City contracted with Alta to address existing data gaps associated with 1) metals concentrations in beach sediments near the slag pile, 2) the potential for metals to leach and/or mobilize from slag material into Lake Pend Oreille, and 3) the geotechnical characteristics of soil in the footprint of a proposed onsite waste repository. Alta conducted Phase II Environmental Site Assessment (ESA) fieldwork for the PSRC in March 2023 and completed the Phase II ESA Report in May 2023 (Alta 2023a).

Following completion of the March 2023 assessment, IDEQ, the City, and Alta identified the need to conduct additional site assessment work at the PSRC Site along the shoreline of Lake Pend Oreille.

The primary purpose of the additional assessment work is to characterize subsurface conditions along the shoreline in the immediate vicinity of and beyond the limits of the slag pile in order to support engineering design for the slag pile and beach/shoreline area cleanup. During the assessment work, which took place in May 2023, Alta collected information to evaluate the extent and depth of slag debris and the presence of constituents of concern (COC) in subsurface sediments. This report documents the results of the COC subsurface sediment sampling.

1.1 Site History

The former PSRC is located in the City of Ponderay and sits along the shoreline of Lake Pend Oreille. The Burlington Northern Santa Fe (BNSF) right-of-way (ROW) borders the Site to the northwest with vacant forested land to the southwest and northeast. The lake serves as a boundary to the southeast. The Site consists of five (5) parcels totaling 18.13 acres and is generally located in the Southeast Quarter of Section 11, Township 57 North, Range 2 West, Boise Meridian, Bonner County, within the City of Ponderay, Idaho. The five individual parcel descriptions are:

- Bonner County, Idaho, Assessor Parcel Number (APN) RPP00000118252A, the area of this parcel is 11.2 acres.

- Bonner County, Idaho APN RPP00000117850A, the area of this parcel is 1.65 acres.
- Bonner County, Idaho APN RPP00000118150A, the area of this parcel is 1.04 acres.
- Bonner County, Idaho APN RPP00000118275A, the area of this parcel is 0.89 acres.
- Bonner County, Idaho APN RPP00000117800A, the area of this parcel is 3.35 acres.

The PSRC was developed in 1904 as a Pb/silver smelter for local mines and the first ingots were poured on June 12, 1907. Production continued until legal action stopped the smelter in July 1907. After a retrofit with roasters and other equipment, the smelter started back up on October 20, 1908, and ran sporadically through March 1909. Salvage crews dismantled the plant and scrapped all salvageable materials in December 1922. Not much evidence of previous activities remains at the Site today, except for remnants of the smelter operations, ore and waste piles, and a large slag dump that extends out into the lake.

Because of past smelting activities, the soil in this area contains high levels of Pb and other metals. Mine wastes at the Site present potential human health impacts to Site users and potential environmental impacts to Lake Pend Oreille. Potential human health and potential impacts to the environment are associated with metals contamination of soils, unprocessed ore, and smelter waste (slag) (IDEQ 2009).

1.2 Previous Site Assessments

Numerous site assessments and an Analysis of Brownfield Cleanup Alternatives (ABCA) were completed for the PSRC between 2010-2013. A detailed summary of previous assessments along with a summary of the March 2023 Phase II ESA findings is documented in the *Phase II Environmental Assessment Report for the Panhandle Smelting and Refining Company, Ponderay, Idaho* (Alta 2023a).

Section 2 Field Activities

The following sections describe the field sampling activities that occurred during the May 2023 assessment.

Appendix A includes soil boring logs. Appendix B includes photographs taken during the sampling activities. Appendix C includes the complete laboratory data sheets and chain-of-custody documentation. Appendix D includes the Site-specific QA/QC Memorandum. Appendix E includes the Archaeological Monitoring report.

2.1 Quality Assurance Project Plan Deviations

In general, sampling procedures followed the *Site Assessment Quality Assurance Project Plan [QAPP] for the Panhandle Smelting and Refining Company* (Alta 2023b) and subsequent *Addendum to the Site Assessment Quality Assurance Project Plan for the Panhandle Smelting and Refining Company, Ponderay, ID* (Alta 2023c) except for the following deviations:

- Due to higher lake surface water elevation at the time of sampling, Alta excavated fewer sample locations due to shallow groundwater causing borehole collapse and less area of exposed sediments. The QAPP Addendum pre-determined 18 locations along approximately 1,500 feet of shoreline; however, due to Site conditions, Alta collected samples from only 13 locations along approximately 500 feet of shoreline.
- The Alta field crew did not use X-ray Fluorescence (XRF) to screen sediments due to soil moisture content. Instead, Alta submitted additional samples to the laboratory for analysis.

2.2 Sediment Sampling

Field staff used a hand auger to excavate thirteen borings along approximately 500 feet of shoreline near the PSRC. Figure 1 includes sediment sampling locations. Alta excavated eight locations in the immediate vicinity of the slag dump (SS-1 through SS-8) and five to the northeast and southwest of the slag dump (SS-9 through SS-13). Alta continued excavations in all sample locations to refusal or borehole collapse due to groundwater inundation. Therefore, boring depths varied at each location, ranging from 1-2 feet below ground surface (bgs) to 10-11 feet bgs. Appendix A includes boring log descriptions of each sampling location.

Samples were collected by field personnel using a gloved hand (wearing clean nitrile gloves) directly from the hand auger cylinder. The field crew placed the collected soil in a double-bagged re-sealable (1-quart) plastic bag filled to approximately $\frac{1}{2}$ full for laboratory submitted samples. Upon collection, the field crew placed samples in a cooler with double-bagged ice. The sample cooler was under direct observation of field staff at all times and samples were held under chain-of-custody until shipment to the laboratory.

Between boring locations, the field crew decontaminated the hand auger using distilled water which had been purchased from a local grocery store in Sandpoint, Idaho, and Liquinox™/distilled water solution. Prior to exiting the field, the field crew decontaminated the hand auger, then collected a field rinsate blank by pouring distilled water over the hand auger cylinder directly into a laboratory-provided nitric acid (HNO₃)-preserved 250 milliliter (mL) plastic container.

The Alta field crew collected 29 samples at various 1-foot intervals from the 13 borings. Alta submitted 15 samples from 11 borings to SVL Analytical (SVL) in Kellogg, Idaho, for analysis of totals metals. Alta selected these samples, ranging in depth from 0-3 feet bgs, to best fill data gaps from prior assessments. Field staff were unable to ship samples immediately; however, the samples were held between 0-4°C under chain-of-custody in a dedicated, secure refrigerator until they were packed on ice and shipped to the laboratory. SVL analyzed the samples for arsenic (As), cadmium (Cd), Pb, and zinc (Zn) using USEPA Method 6020B (USEPA 2014) and for mercury (Hg) using USEPA Method 7471A (USEPA 1994). Field quality control samples included a field duplicate, a field matrix spike/matrix spike duplicate (MS/MSD) sample, and a field rinsate blank.

Section 3 Data Quality Assurance Evaluation

Section 5.0 of the QAPP outlines the data quality objectives (DQOs) and criteria (Alta 2023b). Alta's project Quality Assurance Officer (QAO) reviewed field documentation, results of field and laboratory Quality Assurance/Quality Control (QA/QC) samples, and data reported by the laboratory to ensure that the data had been recorded, transmitted, and processed correctly, and to determine that DQOs were met. Appendix C includes the Analytical Laboratory Results and Chain-of-Custody Documentation and Appendix D includes the Site-specific QA/QC Memorandum, which provides a summary of the data validation and data quality assessment performed by Alta.

3.1 Data Accuracy and Precision

Based on this data quality review, Alta determines the laboratory and field data to be of acceptable quality except for the qualifications that are discussed below.

3.1.1 Accuracy

Alta's QAO did not qualify any data based on percent recovery results (Laboratory Control Sample and MS).

3.1.2 Precision

Alta's QAO qualified the following data based on precision results (MSD or field duplicate):

- Lead is qualified as estimated (J) in sample SS-1-1-2' based on high MSD relative percent difference (RPD).
- Lead and zinc are qualified as estimated (J) in sample SS-6-1-2' and its duplicate sample SS-16-1-2'. While the RPD was not calculated for these analytes due to the concentrations being less than 5 times the reporting limit, the absolute difference between the original and duplicate concentrations was greater than the reporting limit.

3.2 Data Sensitivity

Method blanks and rinsate blanks were utilized to assess sample collection and decontamination methods in the field and laboratory. The following data is qualified based on detections in the rinsate blank sample:

- All samples were qualified as estimated with a high bias (J+) for arsenic due to a detection in the rinsate blank.

It should be noted that one or more sample and/or QC results were flagged "R2B," "M4," or "H1," by the laboratory to indicate QC parameters that did not meet the laboratory or method QC criteria. These flags are qualitative and do not necessarily indicate that a data validation qualifier should be assigned. Except for "J" flags, laboratory-assigned qualifiers are for informational purposes only. Data validation qualifiers, if assigned, supersede the laboratory-assigned flags.

3.3 Data Usability

The Alta QAO rejected 8 sample results out of a possible 75 results; therefore, according to the QAPP (Alta 2023b), the completeness for this sampling event is calculated at 89%, which does not meet the DQO of 90%. These 8 sample results were for non-detect Hg results that were analyzed one day out of hold time. In accordance with the National Functional Guidelines for Inorganics: mercury (USEPA 2020), the non-detect mercury results in these samples are rejected. However, previous results for Hg in sediment samples collected within the vicinity of the slag pile (TerraGraphics 2012a and Alta 2023a) were orders of magnitude below the RSL for resident soil or were not detected.

Section 4 Results

This section summarizes the sediment sample results.

4.1 Sediment Sample Results

Sediment sample results were compared to USEPA's Resident Soil Regional Screening Levels (RSLs) (USEPA 2023) and U.S. Geological Survey (USGS) background values for Bonner County (USGS 2016). As and Pb were detected at concentrations that exceed the USEPA RSL for Resident Soil and background levels in two samples collected from 1-2 feet bgs from

borehole SS-2 and SS-3, which are located at the toe of the slag pile (Figure 1). As and Pb concentrations in SS-2 and SS-3 were 40.9 milligrams per kilogram (mg/kg) and 36.9 mg/kg (As) and 2,710 mg/kg and 6,600 mg/kg (Pb), respectively. Cd, Hg, and Zn were not detected at concentrations above RSLs and background levels. During sampling, field staff encountered slag cobbles with few fines in both borings. The presence of slag prohibited deeper borings in both locations.

As and Pb concentrations are highest in borings closest to or within the toe of the slag pile and within the upper 1-2 feet of sediments. Notable reduction in concentrations were seen with increased distance between the boring location and the slag pile and in SS-4 and SS-5 between 1-2 and 2-3 feet bgs. This indicates that As and/or Pb concentration that exceed residential RSLs and/or background are most likely limited to the upper 1-2 feet of sediments within the immediate vicinity of the slag pile.

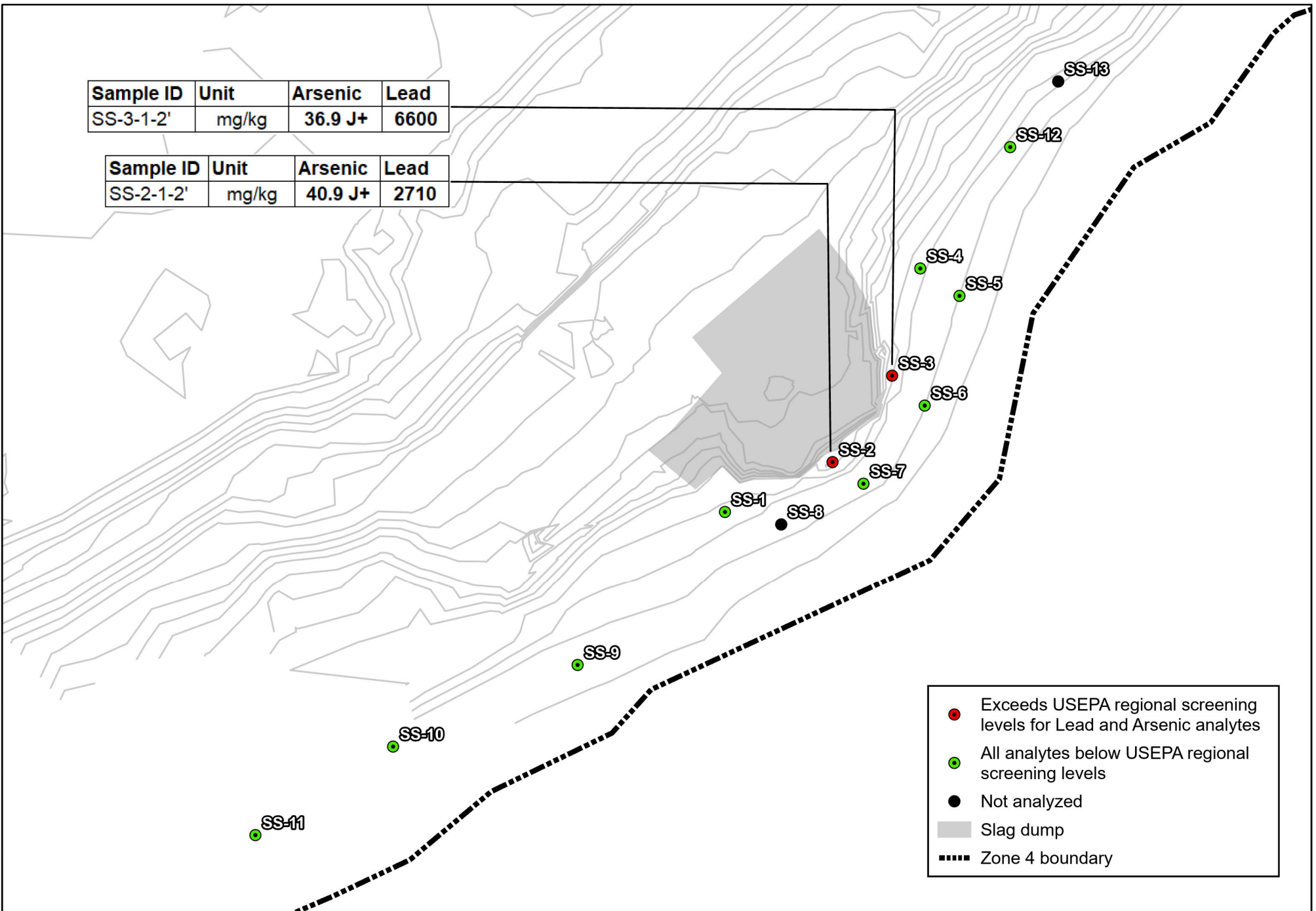
Table 1 summarizes the sediment sample results (expressed in mg/kg). Figure 1 shows the sampling locations.

Section 5 References and Resources Used

- Alta Science & Engineering, Inc. (Alta), 2023a. Phase II Environmental Assessment Report for the Panhandle Smelting and Refining Company, Ponderay, Idaho. May.
- Alta, 2023b. Site Assessment Quality Assurance Project Plan for the Panhandle Smelting and Refining Company, Ponderay, Idaho. Prepared for the City of Ponderay. January 26.
- Alta, 2023c. "Addendum to the Site Assessment Quality Assurance Project Plan for the Panhandle Smelting and Refining Company, Ponderay, Idaho." Memorandum addressed to S.Gill (IDEQ). April 11.
- Idaho Department of Environmental Quality (IDEQ), 2009. Draft Engineering Evaluation/Cost Analysis Developed for Removal of Smelter Wastes at the Panhandle Smelter, Ponderay, Bonner County, Idaho. May.
- United States Environmental Protection Agency (USEPA), 1994. Method 7471A (SW-846): Mercury in Solid or Semisolid Waste (Manual Cold-vapor Technique). Revision 1, September.
- USEPA, 2014. Method 6020B: Inductively Coupled Plasma-Mass Spectrometry. Revision 2, July.
- USEPA, 2023. Regional Screening Level Table for Resident Soil. May.
- United States Geological Survey (USGS), 2016. Average concentrations of elements in Bonner County, Idaho. Page last modified 20 December 2016. Accessed October 2022 at <https://mrdata.usgs.gov/geochem/county.php?place=f16017&el=Pb&rf=northwestern>

Sample ID	Unit	Arsenic	Lead
SS-3-1-2'	mg/kg	36.9 J+	6600

Sample ID	Unit	Arsenic	Lead
SS-2-1-2'	mg/kg	40.9 J+	2710



- Exceeds USEPA regional screening levels for Lead and Arsenic analytes
- All analytes below USEPA regional screening levels
- Not analyzed
- Slag dump
- Zone 4 boundary

C:\Users\angelo.ward\Desktop\Edited map.aprx

PRINT DATE
July 18, 2023

PROJECT NUMBER
22148-30

PROJECT MANAGER
S. Weppner

CARTOGRAPHER
K. Meyer

1:1,000

0 25 50 Feet

IDEQ POBT Zone 4 Property 11 - Soil Sampling Locations

Table 1. Sediment Sample Results

Sample ID	Date	Sample Depth (ft bgs)	Unit	Arsenic	Cadmium	Mercury	Lead	Zinc
SS-1-1-2'								
Result	5/2/2023	1-2	mg/kg	2.30 J+	0.171	ND R	28.8 J	43.6
RL			mg/kg	0.300	0.100	0.033	1.60	8.00
MDL			mg/kg	0.0118	0.072	0.011	1.04	6.40
SS-2-1-2'								
Result	5/2/2023	1-2	mg/kg	40.9 J+	0.450	0.058 J-	2,710	3,340
RL			mg/kg	300	0.100	0.033	160	800
MDL			mg/kg	11.8	0.072	0.011	104	640
SS-3-1-2'								
Result	5/2/2023	1-2	mg/kg	36.9 J+	0.708	0.052 J-	6,600	5,490
RL			mg/kg	300	0.100	0.033	160	800
MDL			mg/kg	11.8	0.072	0.011	104	640
SS-4-1-2'								
Result	5/2/2023	1-2'	mg/kg	4.73 J+	0.262	0.032 J-	194	85.2
RL			mg/kg	0.300	0.100	0.033	16.0	80.0
MDL			mg/kg	0.0118	0.072	0.011	10.4	64.0
SS-4-2-3'								
Result	5/2/2023	2-3	mg/kg	2.50 J+	0.097 J	ND R	3.76	24.3
RL			mg/kg	0.300	0.100	0.033	0.100	8.00
MDL			mg/kg	0.0118	0.072	0.011	0.052	6.40
SS-5-1-2'								
Result	5/2/2023	1-2	mg/kg	10.4 J+	0.227	0.039 J-	309	1,080
RL			mg/kg	0.300	0.100	0.033	16.0	80.0
MDL			mg/kg	0.0118	0.072	0.011	10.4	64.0
SS-5-2-3'								
Result	5/2/2023	2-3'	mg/kg	6.96 J+	0.189	ND R	17.1	73.8
RL			mg/kg	0.300	0.100	0.033	1.60	8.00
MDL			mg/kg	0.0118	0.072	0.011	1.04	6.40
SS-6-1-2' *								
Result	5/2/2023	1-2'	mg/kg	10.0 J+	0.287	0.015 J-	76.3 J	356 J
RL			mg/kg	0.300	0.100	0.033	16.0	80.0
MDL			mg/kg	0.0118	0.072	0.011	10.4	64.0
SS-7-1-2'								
Result	5/2/2023	1-2'	mg/kg	11.9 J+	0.257	0.033 J-	283	201
RL			mg/kg	0.300	0.100	0.033	16.0	80.0
MDL			mg/kg	0.0118	0.072	0.011	10.4	64.0
SS-9-0-1'								
Result	5/2/2023	0-1'	mg/kg	7.73 J+	0.292	0.025 J-	51.3	179
RL			mg/kg	0.300	0.100	0.033	16.0	80.0
MDL			mg/kg	0.0118	0.072	0.011	10.4	64.0
SS-10-0-1'								
Result	5/2/2023	0-1'	mg/kg	2.43 J+	0.282	ND R	9.70	50.1
RL			mg/kg	0.300	0.100	0.033	0.160	8.00
MDL			mg/kg	0.0118	0.072	0.011	0.104	6.40
SS-11-0-1'								
Result	5/2/2023	0-1'	mg/kg	1.88 J+	ND	ND R	2.68	21.4
RL			mg/kg	0.300	0.100	0.033	0.100	8.00
MDL			mg/kg	0.0118	0.072	0.011	0.052	6.40
SS-12-0-1'								
Result	5/2/2023	0-1'	mg/kg	6.58 J+	0.153	ND R	53.0	262
RL			mg/kg	0.300	0.100	0.033	16.0	80.0
MDL			mg/kg	0.0118	0.072	0.011	10.4	64.0
SS-12-1-2'								
Result	5/2/2023	1-2'	mg/kg	3.90 J+	0.099 J	ND R	15.8 J	131
RL			mg/kg	0.300	0.100	0.033	16.0	80.0
MDL			mg/kg	0.0118	0.072	0.011	10.4	64.0
SS-12-2-3'								
Result	5/2/2023	2-3'	mg/kg	3.45 J+	0.116	ND R	12.7	121
RL			mg/kg	0.300	0.100	0.033	0.160	8.00
MDL			mg/kg	0.0118	0.072	0.011	0.104	6.40
Bonner County Background Levels¹	Mean			5.68	-	0.08	30.79	72.31
	Minimum			1.11	-	0.02	24.10	35.72
	Maximum			27.6	-	0.1	82.8	180.4
USEPA RSL Resident Soil²				0.68	7.10	11.0	400	23,000

Notes:

¹USGS 2016.

²USEPA Regional Screening Level (RSL) Resident Soil (May 2023)

Analytical tests for arsenic, cadmium, lead, and zinc used USEPA Method 6020B. Mercury used USEPA Method 7471A.

A bolded value indicates a concentration higher than RSL and background levels.

A shaded cell indicates a reporting limit (RL) or method detection limit (MDL) that is higher than the RSL.

* Duplicate sample, higher result shown.

ft bgs = feet below ground surface

mg/kg = milligram per kilogram

ND = not detected above the MDL

J = The reported value is less than the Reporting Limit, but greater than or equal to the MDL. Results closer to the MDL have increased relative uncertainty.







Appendix A
Soil Boring Logs

BORING LOG SS-1

(Page 1 of 1)

Date Drilled: : 5/2/2023
 Drilling Co.: : Alta
 Drilling Method: : Hand Auger
 Sampling Method: :
 Borehole Diameter: : 6.5"
 Casing Diameter: :
 Total Depth: : 7' bgs
 First GW Depth: :
 IDWR Well ID: : N/A

Project No.: : 22148
 Site: : Pend d'Orielle Bay Trail, Zone 4, Property 11
 Logged By: : Brady Brantley
 Reviewed By: :
 Signature: : _____

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						 No Recovery  Sampled Interval  Described Sample  Preserved Sample	 After Completion  During Drilling	
0								Silty Sand: fine sand, light gray, well graded (0,20,80,0)
					SM			
								Sandy Clay: fine sand, tan (50,0,50,0)
					SC			Redox
								Silty Sand: very fine sand, light gray, well graded (0,20,80,0)
					SM			
5								
10								
15								



Soil Cuttings



BORING LOG SS-2

(Page 1 of 1)

Date Drilled: : 5/2/2023
 Drilling Co.: : Alta
 Drilling Method: : Hand Auger
 Sampling Method: :
 Borehole Diameter: : 30"
 Casing Diameter: :
 Total Depth: : 3' bgs
 First GW Depth: :
 IDWR Well ID: : N/A

Project No.: : 22148
 Site: : Pend d'Orielle Bay Trail, Zone 4, Property 11
 Logged By: : Brady Brantley
 Reviewed By: :
 Signature: : _____

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								Slag Cobbles: very few fines, 1-4" cobbles (0,5,0,95)
					GW			
5								
10								
15								





BORING LOG SS-3

(Page 1 of 1)

Date Drilled: : 5/2/2023
 Drilling Co.: : Alta
 Drilling Method: : Hand Auger
 Sampling Method: :
 Borehole Diameter: : 28"
 Casing Diameter: :
 Total Depth: : 3' bgs
 First GW Depth: :
 IDWR Well ID: : N/A








Project No.: : 22148
 Site: : Pend d'Orielle Bay Trail, Zone 4, Property 11
 Logged By: : Brady Brantley
 Reviewed By: :
 Signature: : _____

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								Slag Cobbles: some sands (0,0,5,95)
					GW			
5								
10								
15								



Date Drilled: : 5/2/2023
 Drilling Co.: : Alta
 Drilling Method: : Hand Auger
 Sampling Method: :
 Borehole Diameter: : N/A
 Casing Diameter: :
 Total Depth: : 6' bgs
 First GW Depth: :
 IDWR Well ID: : N/A

Project No.: : 22148
 Site: : Pend d'Orielle Bay Trail, Zone 4, Property 11
 Logged By: : Brady Brantley
 Reviewed By: :
 Signature: : _____

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)	Soil Cuttings
						 No Recovery  Sampled Interval  Described Sample  Preserved Sample	 After Completion  During Drilling		
0					SW			Coarse Sand: light gray, dry, well graded (0,0,100,0)	
					SC			Sandy Clay: fine sand, moist, tan (40,40,20,0)	
					SM			Silty Sand: very fine sand, light gray, well graded (0,20,80,0)	
					SM			Silty Sand: very fine sand, dark gray, moist (0,20,80,0)	
5								wet	
10									
15									

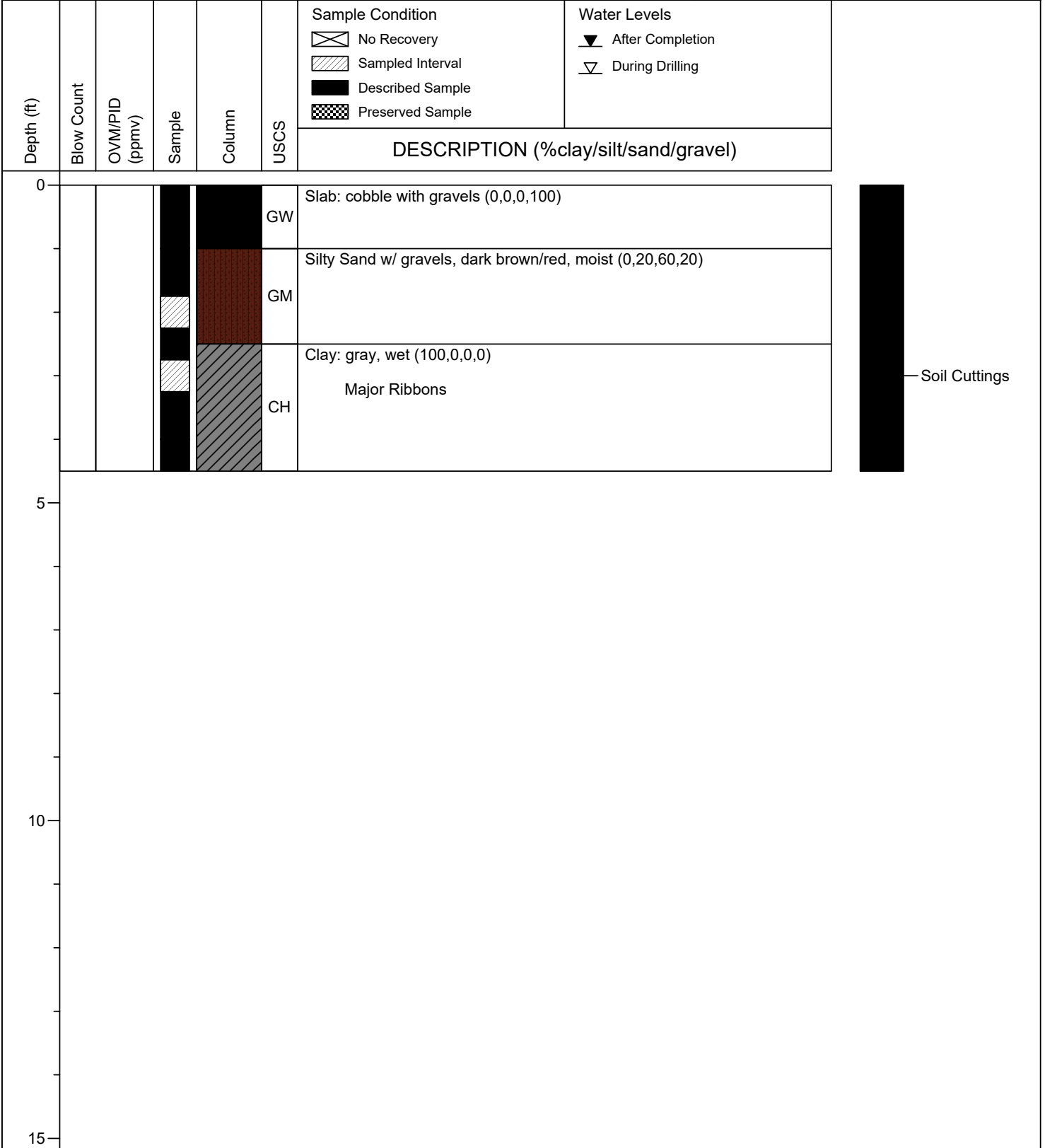


BORING LOG SS-5

(Page 1 of 1)

Date Drilled: : 5/2/2023
 Drilling Co.: : Alta
 Drilling Method: : Hand Auger
 Sampling Method: :
 Borehole Diameter: : N/A
 Casing Diameter: :
 Total Depth: : 4.5' bgs
 First GW Depth: : 3.5'
 IDWR Well ID: : N/A

Project No.: : 22148
 Site: : Pend d'Orielle Bay Trail, Zone 4, Property 11
 Logged By: : Brady Brantley
 Reviewed By: :
 Signature: : _____










BORING LOG SS-6

(Page 1 of 1)

Date Drilled: : 5/2/2023
 Drilling Co.: : Alta
 Drilling Method: : Hand Auger
 Sampling Method: :
 Borehole Diameter: : N/A
 Casing Diameter: :
 Total Depth: : 11' bgs
 First GW Depth: : 40"
 IDWR Well ID: : N/A

Project No.: : 22148
 Site: : Pend d'Orielle Bay Trail, Zone 4, Property 11
 Logged By: : Brady Brantley
 Reviewed By: :
 Signature: : _____







Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)	Soil Cuttings
						 No Recovery  Sampled Interval  Described Sample  Preserved Sample	 After Completion  During Drilling		
0								Gravel with sand: slag, trace cobbles, gray (0,0,20,80)	
					GW				
					SC			Silt w/ Sand w/ Clay: brown (33,33,34,0)	
								Clay: gray, wet (100,0,0,0)	
					CH				
5									
10									
15									

BORING LOG SS-7

(Page 1 of 1)

Date Drilled: : 5/2/2023
 Drilling Co.: : Alta
 Drilling Method: : Hand Auger
 Sampling Method: :
 Borehole Diameter: : N/A
 Casing Diameter: :
 Total Depth: : 11' bgs
 First GW Depth: : 40"
 IDWR Well ID: : N/A

Project No.: : 22148
 Site: : Pend d'Orielle Bay Trail, Zone 4, Property 11
 Logged By: : Brady Brantley
 Reviewed By: :
 Signature: : _____

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						 No Recovery  Sampled Interval  Described Sample  Preserved Sample	 After Completion  During Drilling	
0								Gravel with sand: slag, trace cobbles, gray (0,0,20,80)
					GW			
					SC			Silt w/ Sand w/ Clay: brown (33,33,34,0)
					CH			Clay: gray, wet (100,0,0,0)
5								
10								
15								



Soil Cuttings



BORING LOG SS-8

(Page 1 of 1)

Date Drilled: : 5/2/2023
 Drilling Co.: : Alta
 Drilling Method: : Hand Auger
 Sampling Method: :
 Borehole Diameter: : N/A
 Casing Diameter: :
 Total Depth: : 8.5' bgs
 First GW Depth: :
 IDWR Well ID: : N/A

Project No.: : 22148
 Site: : Pend d'Orielle Bay Trail, Zone 4, Property 11
 Logged By: : Brady Brantley
 Reviewed By: :
 Signature: : _____

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						No Recovery Sampled Interval Described Sample Preserved Sample	After Completion During Drilling	
0					GW			Gravel with sand: slag, trace cobbles, black (0,0,20,80)
					SC			Clay w/ Sand: gray (80,0,20,0)
					CH			Clay: gray, wet (100,0,0,0)
5								
10								
15								









Soil Cuttings

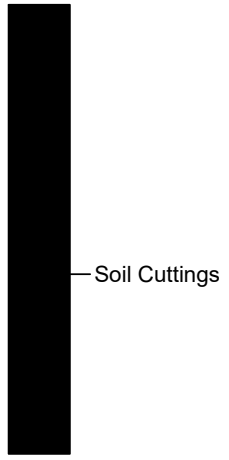
BORING LOG SS-9

(Page 1 of 1)

Date Drilled: : 5/2/2023
 Drilling Co.: : Alta
 Drilling Method: : Hand Auger
 Sampling Method: :
 Borehole Diameter: : N/A
 Casing Diameter: :
 Total Depth: : 5' bgs
 First GW Depth: : 30"
 IDWR Well ID: : N/A











Project No.: : 22148
 Site: : Pend d'Orielle Bay Trail, Zone 4, Property 11
 Logged By: : Brady Brantley
 Reviewed By: :
 Signature: : _____

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						 No Recovery  Sampled Interval  Described Sample  Preserved Sample	 After Completion  During Drilling	
0					GW			Gravel with sand: light gray (0,0,50,50)
					SC			Clay: gray (100,0,0,0)
					CH			Organics: decomposed driftwood/roots
					SW			Silty Sand: trace fines, dark gray (0,10,90,0)
5								
10								
15								



Date Drilled: : 5/2/2023
 Drilling Co.: : Alta
 Drilling Method: : Hand Auger
 Sampling Method: :
 Borehole Diameter: : N/A
 Casing Diameter: :
 Total Depth: : 2' bgs
 First GW Depth: : 2'
 IDWR Well ID: : N/A

Project No.: : 22148
 Site: : Pend d'Orielle Bay Trail, Zone 4, Property 11
 Logged By: : Brady Brantley
 Reviewed By: :
 Signature: : _____

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						 No Recovery  Sampled Interval  Described Sample  Preserved Sample	 After Completion  During Drilling	
0					GW			Coarse Sand: dark brown, wet (0,0,100,0)
					SC			Clay: trace sand (90,0,10,0)
5								
10								
15								












BORING LOG SS-11

(Page 1 of 1)

Date Drilled: : 5/2/2023
 Drilling Co.: : Alta
 Drilling Method: : Hand Auger
 Sampling Method: :
 Borehole Diameter: : N/A
 Casing Diameter: :
 Total Depth: : 1' bgs
 First GW Depth: : 3"
 IDWR Well ID: : N/A

Project No.: : 22148
 Site: : Pend d'Orielle Bay Trail, Zone 4, Property 11
 Logged By: : Brady Brantley
 Reviewed By: :
 Signature: : _____

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						 No Recovery  Sampled Interval  Described Sample  Preserved Sample	 After Completion  During Drilling	
0					SW	Silty Sand: trace angular rock, coarse to fine sand w/ depth (0,0,100,0) 100% recovery	 Soil Cuttings	
5								
10								
15								

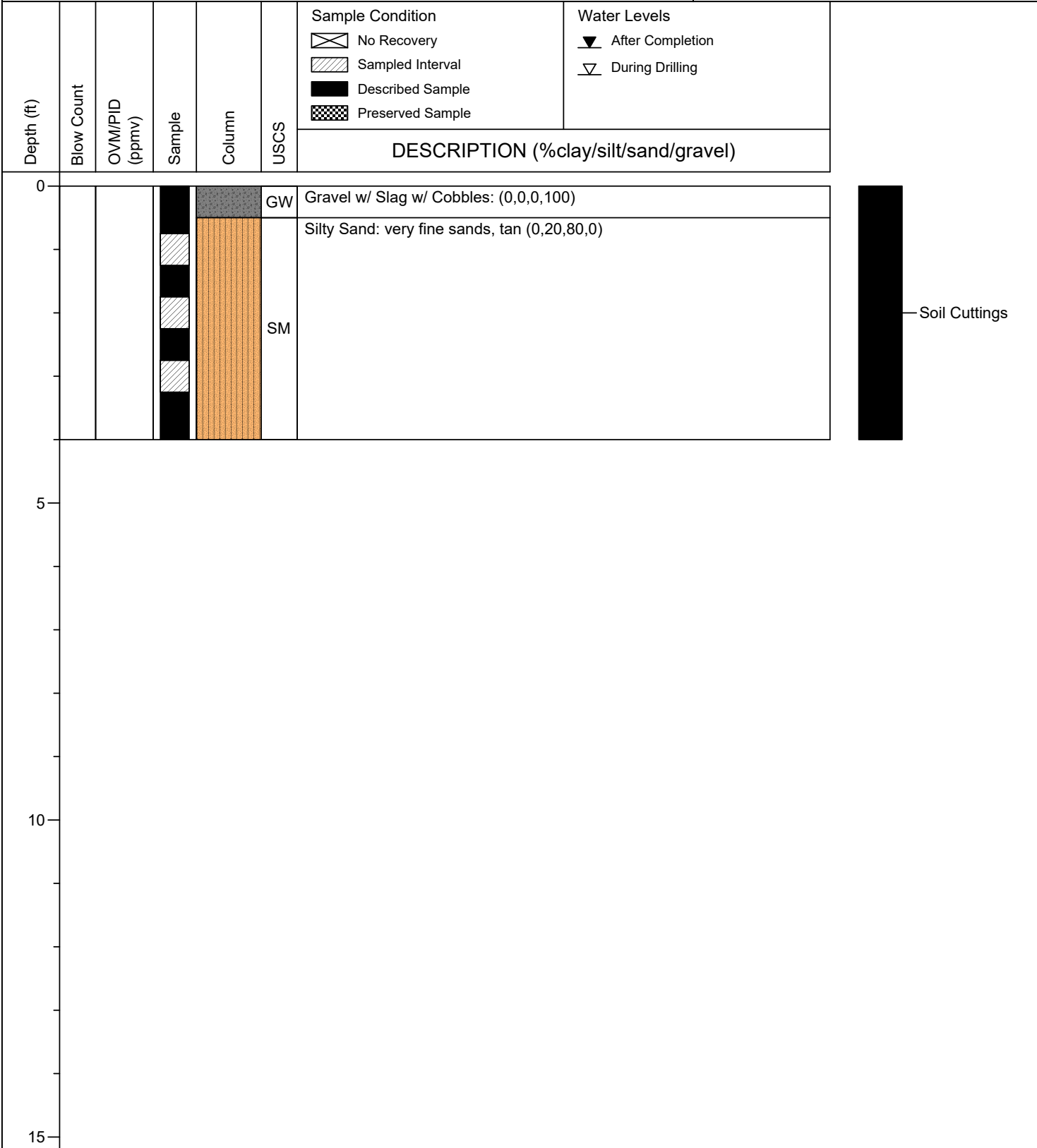


BORING LOG SS-12

(Page 1 of 1)

Date Drilled: : 5/2/2023
 Drilling Co.: : Alta
 Drilling Method: : Hand Auger
 Sampling Method: :
 Borehole Diameter: : N/A
 Casing Diameter: :
 Total Depth: : 4' bgs
 First GW Depth: : 28"
 IDWR Well ID: : N/A

Project No.: : 22148
 Site: : Pend d'Orielle Bay Trail, Zone 4, Property 11
 Logged By: : Brady Brantley
 Reviewed By: :
 Signature: : _____



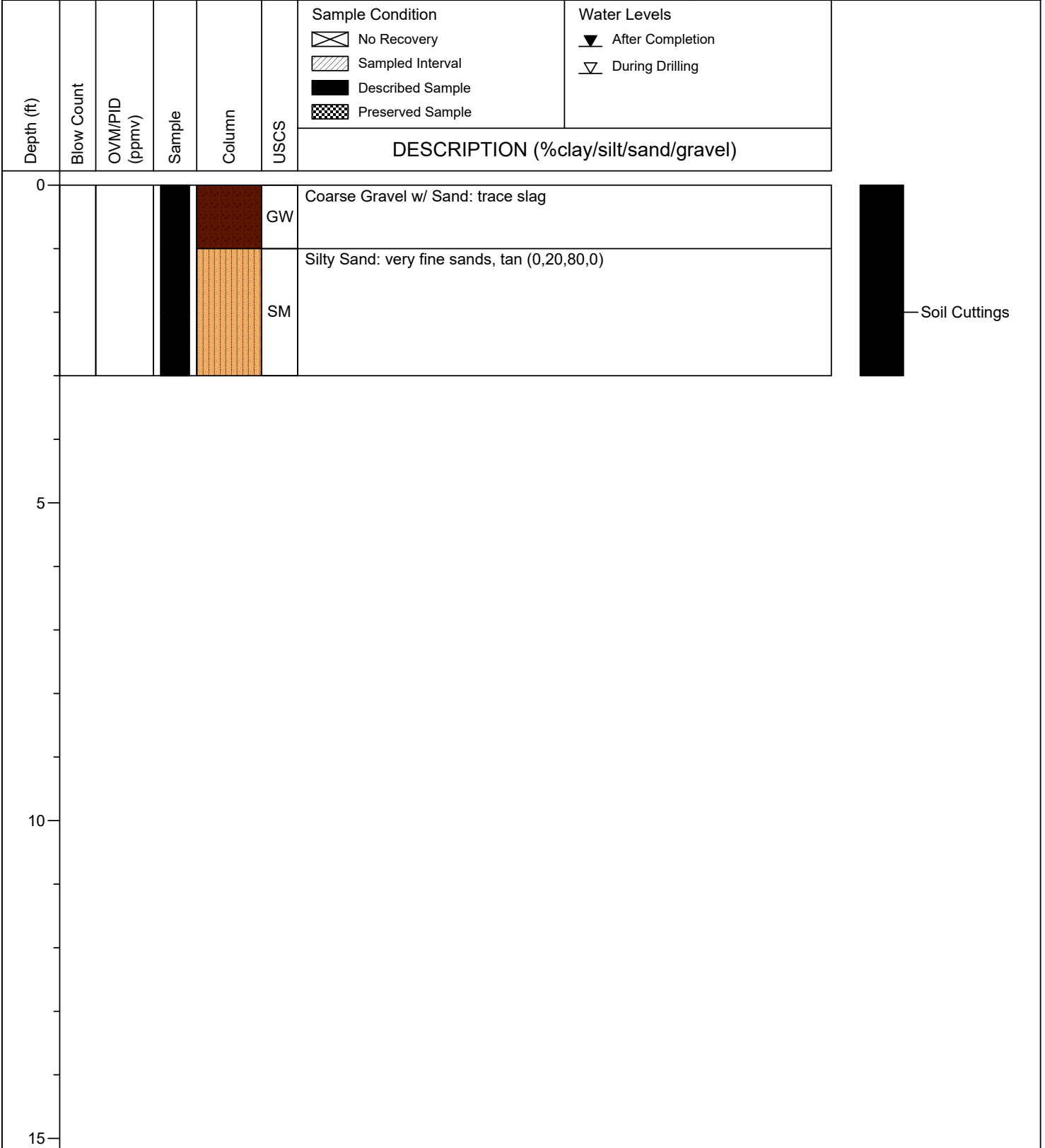


BORING LOG SS-13

(Page 1 of 1)

Date Drilled: : 5/2/2023
 Drilling Co.: : Alta
 Drilling Method: : Hand Auger
 Sampling Method: :
 Borehole Diameter: : N/A
 Casing Diameter: :
 Total Depth: : 3' bgs
 First GW Depth: : 0.5'
 IDWR Well ID: : N/A

Project No.: : 22148
 Site: : Pend d'Orielle Bay Trail, Zone 4, Property 11
 Logged By: : Brady Brantley
 Reviewed By: :
 Signature: : _____



Appendix B
Photographs

Photo 1



Equipment utilized for soil borings

Photo 2



SS-1 soils

Photo 3



SS-1 soils top

Photo 4



SS-1 soils bottom

Photo 5



SS-2 soils

Photo 6



SS-2 borehole

Photo 7



SS-2 boring location facing northwest/slag pile

Photo 8



SS-3 soils



PRINT DATE:
June 16, 2023

PROJECT NUMBER:
22148-30

PROJECT MANAGER:
Sarah Weppner

CREATED BY:
Tom Jenkins

PROJECT NAME:
IDEQ – POBT Zone 4
Property 11 TO#51 –
Ponderay, ID

APPENDIX B, PHOTO LOG

IDEQ – POBT Zone 4 Property 11 TO#51 –
Additional Assessment

Photo 9



SS-3 location facing northwest

Photo 10



SS-4 soils

Photo 11



SS-4 soils top

Photo 12



SS-4 soils bottom



PRINT DATE:
June 16, 2023

PROJECT NUMBER:
22148-30

PROJECT MANAGER:
Sarah Weppner

CREATED BY:
Tom Jenkins

PROJECT NAME:
IDEQ – POBT Zone 4
Property 11 TO#51 –
Ponderay, ID

APPENDIX B, PHOTO LOG

IDEQ – POBT Zone 4 Property 11 TO#51 –
Additional Assessment

Photo 13



SS-5 soils

Photo 14



SS-5 soils bottom (heavy clay content)

Photo 15



SS-6 soils

Photo 16



SS-6 soils top

Photo 17



SS-6 soils bottom

Photo 18



SS-7 soils

Photo 19



SS-7 soils top

Photo 20



SS-7 soils bottom



PRINT DATE:
June 16, 2023

PROJECT MANAGER:
Sarah Weppner

PROJECT NUMBER:
22148-30

CREATED BY:
Tom Jenkins

PROJECT NAME:
IDEQ – POBT Zone 4
Property 11 TO#51 –
Ponderay, ID

APPENDIX B, PHOTO LOG

IDEQ – POBT Zone 4 Property 11 TO#51 –
Additional Assessment

Photo 21



SS-8 soils

Photo 22



SS-8 soils top

Photo 23



SS-8 soils bottom

Photo 24



SS-9 soils

Photo 25



SS-9 soils top

Photo 26



SS-9 soils bottom

Photo 27



SS-9 location facing north

Photo 28



SS-10 soils



PRINT DATE:
June 16, 2023

PROJECT NUMBER:
22148-30

PROJECT MANAGER:
Sarah Weppner

CREATED BY:
Tom Jenkins

PROJECT NAME:
IDEQ – POBT Zone 4
Property 11 TO#51 –
Ponderay, ID

APPENDIX B, PHOTO LOG

IDEQ – POBT Zone 4 Property 11 TO#51 –
Additional Assessment

Photo 29



SS-10 soils

Photo 30



SS-10 location facing north

Photo 31



SS-11 location facing north

Photo 32



SS-11 soils



PRINT DATE:
June 16, 2023

PROJECT NUMBER:
22148-30

PROJECT MANAGER:
Sarah Weppner

CREATED BY:
Tom Jenkins

PROJECT NAME:
IDEQ – POBT Zone 4
Property 11 TO#51 –
Ponderay, ID

APPENDIX B, PHOTO LOG

IDEQ – POBT Zone 4 Property 11 TO#51 –
Additional Assessment

Photo 33



SS-12 soils

Photo 34



SS-13 soils and location facing north

Photo 35



SS-13 borehole

Photo 36



Sandy soils from SS-11



PRINT DATE:
June 16, 2023

PROJECT MANAGER:
Sarah Weppner

PROJECT NUMBER:
22148-30

CREATED BY:
Tom Jenkins

PROJECT NAME:
IDEQ – POBT Zone 4
Property 11 TO#51 –
Ponderay, ID

APPENDIX B, PHOTO LOG

IDEQ – POBT Zone 4 Property 11 TO#51 –
Additional Assessment

Appendix C
Analytical Laboratory Results and Chain of Custody Documentation



Alta Science and Engineering - Moscow

220 E. 5th St, Ste 325

Moscow, ID 83843

Work Order:

X3E0341

Reported:

28-Jun-23 10:02

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received	Notes
SS-1-1-2'	X3E0341-01	Soil	02-May-23 08:16	TJ	18-May-2023	Q6
SS-12-1-2'	X3E0341-02	Soil	02-May-23 15:41	TJ	18-May-2023	Q6
SS-10-0-1'	X3E0341-03	Soil	02-May-23 15:05	TJ	18-May-2023	Q6
SS-9-0-1'	X3E0341-04	Soil	02-May-23 14:37	TJ	18-May-2023	Q6
SS-12-2-3'	X3E0341-05	Soil	02-May-23 15:45	TJ	18-May-2023	Q6
SS-12-0-1'	X3E0341-06	Soil	02-May-23 15:35	TJ	18-May-2023	Q6
SS-11-0-1'	X3E0341-07	Soil	02-May-23 15:15	TJ	18-May-2023	Q6
SS-6-1-2'	X3E0341-08	Soil	02-May-23 12:15	TJ	18-May-2023	Q6
SS-7-1-2'	X3E0341-09	Soil	02-May-23 13:08	TJ	18-May-2023	Q6
SS-5-2-3'	X3E0341-10	Soil	02-May-23 11:13	TJ	18-May-2023	Q6
SS-2-1-2'	X3E0341-11	Soil	02-May-23 09:37	TJ	18-May-2023	Q6
SS-5-1-2'	X3E0341-12	Soil	02-May-23 11:10	TJ	18-May-2023	Q6
SS-4-1-2'	X3E0341-13	Soil	02-May-23 10:40	TJ	18-May-2023	Q6
SS-3-1-2'	X3E0341-14	Soil	02-May-23 10:20	TJ	18-May-2023	Q6
SS-4-2-3'	X3E0341-15	Soil	02-May-23 10:46	TJ	18-May-2023	Q6
RB-1	X3E0341-16	Water	02-May-23 17:30		18-May-2023	
SS-16-1-2'	X3E0341-17	Soil	02-May-23 12:15	TJ	18-May-2023	Q6

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested.

(Q6) SVL received the following containers outside of published EPA guidelines for preservation temperatures (0-6°C).

The guidelines do not pertain to nitric-preserved metals.

Default Cooler (Received Temperature: 17.8°C)

Labnumber	Container	Client ID	Labnumber	Container	Client ID
X3E0341-01 A	Bag, Ziploc	SS-1-1-2'	X3E0341-01 B	Bag, Ziploc	SS-1-1-2'
X3E0341-02 A	Bag, Ziploc	SS-12-1-2'	X3E0341-02 B	Bag, Ziploc	SS-12-1-2'
X3E0341-03 A	Bag, Ziploc	SS-10-0-1'	X3E0341-03 B	Bag, Ziploc	SS-10-0-1'
X3E0341-04 A	Bag, Ziploc	SS-9-0-1'	X3E0341-04 B	Bag, Ziploc	SS-9-0-1'
X3E0341-05 A	Bag, Ziploc	SS-12-2-3'	X3E0341-05 B	Bag, Ziploc	SS-12-2-3'
X3E0341-06 A	Bag, Ziploc	SS-12-0-1'	X3E0341-06 B	Bag, Ziploc	SS-12-0-1'
X3E0341-07 A	Bag, Ziploc	SS-11-0-1'	X3E0341-07 B	Bag, Ziploc	SS-11-0-1'
X3E0341-08 A	Bag, Ziploc	SS-6-1-2'	X3E0341-08 B	Bag, Ziploc	SS-6-1-2'
X3E0341-09 A	Bag, Ziploc	SS-7-1-2'	X3E0341-09 B	Bag, Ziploc	SS-7-1-2'
X3E0341-10 A	Bag, Ziploc	SS-5-2-3'	X3E0341-10 B	Bag, Ziploc	SS-5-2-3'
X3E0341-11 A	Bag, Ziploc	SS-2-1-2'	X3E0341-11 B	Bag, Ziploc	SS-2-1-2'
X3E0341-12 A	Bag, Ziploc	SS-5-1-2'	X3E0341-12 B	Bag, Ziploc	SS-5-1-2'
X3E0341-13 A	Bag, Ziploc	SS-4-1-2'	X3E0341-13 B	Bag, Ziploc	SS-4-1-2'
X3E0341-14 A	Bag, Ziploc	SS-3-1-2'	X3E0341-14 B	Bag, Ziploc	SS-3-1-2'
X3E0341-15 A	Bag, Ziploc	SS-4-2-3'	X3E0341-15 B	Bag, Ziploc	SS-4-2-3'
X3E0341-16 A	Nitric HDPE	RB-1	X3E0341-17 A	Bag, Ziploc	SS-16-1-2'
X3E0341-17 B	Bag, Ziploc	SS-16-1-2'			



One Government Gulch - PO Box 929

Kellogg, ID 83837-0929

(208) 784-1258

www.svl.net

Alta Science and Engineering - Moscow

220 E. 5th St, Ste 325

Moscow, ID 83843

Work Order:

X3E0341

Reported:

28-Jun-23 10:02

Case Narrative: X3E0341

The state of origin only accredits for drinking water analyses.



Alta Science and Engineering - Moscow

220 E. 5th St, Ste 325

Moscow, ID 83843

Work Order: **X3E0341**

Reported: 28-Jun-23 10:02

Client Sample ID: **SS-1-1-2'**

Sampled: 02-May-23 08:16

Received: 18-May-23

Sampled By: TJ

SVL Sample ID: **X3E0341-01 (Soil)**

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals by EPA 6000/7000 Series (Sieved)										
EPA 6020B	Arsenic	2.30	mg/kg	0.300	0.0118	2	X322014	SMU	06/01/23 10:08	
EPA 6020B	Cadmium	0.171	mg/kg	0.100	0.072	2	X322014	SMU	06/01/23 10:08	
EPA 6020B	Lead	28.8	mg/kg	1.60	1.04	20	X322014	SMU	06/01/23 11:18	D2,M4
EPA 6020B	Zinc	43.6	mg/kg	8.00	6.40	20	X322014	SMU	06/01/23 11:18	D2,M4
EPA 7471A	Mercury	< 0.011	mg/kg	0.033	0.011		X322043	JRR	05/31/23 13:12	H1,U

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Dave Tryon
Project Manager



Alta Science and Engineering - Moscow

220 E. 5th St, Ste 325

Moscow, ID 83843

Work Order: **X3E0341**

Reported: 28-Jun-23 10:02

Client Sample ID: **SS-12-1-2'**

Sampled: 02-May-23 15:41

Received: 18-May-23

Sampled By: TJ

SVL Sample ID: **X3E0341-02 (Soil)**

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals by EPA 6000/7000 Series (Sieved)										
EPA 6020B	Arsenic	3.90	mg/kg	0.300	0.0118	2	X322014	SMU	06/01/23 10:16	
EPA 6020B	Cadmium	0.099	mg/kg	0.100	0.072	2	X322014	SMU	06/01/23 10:16	J
EPA 6020B	Lead	15.8	mg/kg	16.0	10.4	200	X322014	SMU	06/01/23 11:27	D2,J
EPA 6020B	Zinc	131	mg/kg	80.0	64.0	200	X322014	SMU	06/01/23 11:27	D2
EPA 7471A	Mercury	< 0.011	mg/kg	0.033	0.011		X322043	JRR	05/31/23 13:59	H1,U

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Dave Tryon
Project Manager



Alta Science and Engineering - Moscow

220 E. 5th St, Ste 325

Moscow, ID 83843

Work Order: **X3E0341**

Reported: 28-Jun-23 10:02

Client Sample ID: **SS-10-0-1'**

Sampled: 02-May-23 15:05

Received: 18-May-23

Sampled By: TJ

SVL Sample ID: **X3E0341-03 (Soil)**

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals by EPA 6000/7000 Series (Sieved)										
EPA 6020B	Arsenic	2.43	mg/kg	0.300	0.0118	2	X322014	SMU	06/01/23 10:18	
EPA 6020B	Cadmium	0.282	mg/kg	0.100	0.072	2	X322014	SMU	06/01/23 10:18	
EPA 6020B	Lead	9.70	mg/kg	0.160	0.104	2	X322014	SMU	06/01/23 10:18	
EPA 6020B	Zinc	50.1	mg/kg	8.00	6.40	20	X322014	SMU	06/01/23 11:29	D2
EPA 7471A	Mercury	< 0.011	mg/kg	0.033	0.011		X322043	JRR	05/31/23 14:01	H1,U

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Dave Tryon
Project Manager



Alta Science and Engineering - Moscow

220 E. 5th St, Ste 325

Moscow, ID 83843

Work Order: **X3E0341**

Reported: 28-Jun-23 10:02

Client Sample ID: **SS-9-0-1'**

Sampled: 02-May-23 14:37

Received: 18-May-23

Sampled By: TJ

SVL Sample ID: **X3E0341-04 (Soil)**

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals by EPA 6000/7000 Series (Sieved)										
EPA 6020B	Arsenic	7.73	mg/kg	0.300	0.0118	2	X322014	SMU	06/01/23 10:20	
EPA 6020B	Cadmium	0.292	mg/kg	0.100	0.072	2	X322014	SMU	06/01/23 10:20	
EPA 6020B	Lead	51.3	mg/kg	16.0	10.4	200	X322014	SMU	06/01/23 11:31	D2
EPA 6020B	Zinc	179	mg/kg	80.0	64.0	200	X322014	SMU	06/01/23 11:31	D2
EPA 7471A	Mercury	0.025	mg/kg	0.033	0.011		X322043	JRR	05/31/23 14:03	H1,J

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Dave Tryon
Project Manager



Alta Science and Engineering - Moscow

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Work Order: **X3E0341**

Reported: 28-Jun-23 10:02

Client Sample ID: **SS-12-2-3'**

SVL Sample ID: **X3E0341-05 (Soil)**

Sampled: 02-May-23 15:45

Received: 18-May-23

Sampled By: TJ

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals by EPA 6000/7000 Series (Sieved)										
EPA 6020B	Arsenic	3.45	mg/kg	0.300	0.0118	2	X322014	SMU	06/01/23 10:22	
EPA 6020B	Cadmium	0.116	mg/kg	0.100	0.072	2	X322014	SMU	06/01/23 10:22	
EPA 6020B	Lead	12.7	mg/kg	0.160	0.104	2	X322014	SMU	06/01/23 10:22	
EPA 6020B	Zinc	121	mg/kg	8.00	6.40	20	X322014	SMU	06/01/23 11:33	D2
EPA 7471A	Mercury	< 0.011	mg/kg	0.033	0.011		X322043	JRR	05/31/23 14:05	H1,U

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Dave Tryon
Project Manager



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Work Order: **X3E0341**

Reported: 28-Jun-23 10:02

Client Sample ID: **SS-12-0-1'**

Sampled: 02-May-23 15:35

Received: 18-May-23

Sampled By: TJ

SVL Sample ID: **X3E0341-06 (Soil)**

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals by EPA 6000/7000 Series (Sieved)										
EPA 6020B	Arsenic	6.58	mg/kg	0.300	0.0118	2	X322014	SMU	06/01/23 10:36	
EPA 6020B	Cadmium	0.153	mg/kg	0.100	0.072	2	X322014	SMU	06/01/23 10:36	
EPA 6020B	Lead	53.0	mg/kg	16.0	10.4	200	X322014	SMU	06/01/23 14:00	D2
EPA 6020B	Zinc	262	mg/kg	80.0	64.0	200	X322014	SMU	06/01/23 11:51	D2
EPA 7471A	Mercury	< 0.011	mg/kg	0.033	0.011		X322043	JRR	05/31/23 14:07	H1,U

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Dave Tryon
Project Manager



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Work Order: **X3E0341**

Reported: 28-Jun-23 10:02

Client Sample ID: **SS-11-0-1'**

SVL Sample ID: **X3E0341-07 (Soil)**

Sampled: 02-May-23 15:15

Received: 18-May-23

Sampled By: TJ

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals by EPA 6000/7000 Series (Sieved)										
EPA 6020B	Arsenic	1.88	mg/kg	0.300	0.0118	2	X322014	SMU	06/01/23 10:38	
EPA 6020B	Cadmium	< 0.072	mg/kg	0.100	0.072	2	X322014	SMU	06/01/23 10:38	U
EPA 6020B	Lead	2.68	mg/kg	0.100	0.052		X322014	SMU	06/01/23 14:01	
EPA 6020B	Zinc	21.4	mg/kg	8.00	6.40	20	X322014	SMU	06/01/23 11:53	D2
EPA 7471A	Mercury	< 0.011	mg/kg	0.033	0.011		X322043	JRR	05/31/23 14:09	H1,U

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Dave Tryon
Project Manager



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Work Order: **X3E0341**

Reported: 28-Jun-23 10:02

Client Sample ID: **SS-6-1-2'**

Sampled: 02-May-23 12:15

Received: 18-May-23

Sampled By: TJ

SVL Sample ID: **X3E0341-08 (Soil)**

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals by EPA 6000/7000 Series (Sieved)										
EPA 6020B	Arsenic	9.70	mg/kg	0.300	0.0118	2	X322014	SMU	06/01/23 10:40	
EPA 6020B	Cadmium	0.280	mg/kg	0.100	0.072	2	X322014	SMU	06/01/23 10:40	
EPA 6020B	Lead	76.3	mg/kg	16.0	10.4	200	X322014	SMU	06/01/23 14:03	D2
EPA 6020B	Zinc	356	mg/kg	80.0	64.0	200	X322014	SMU	06/01/23 11:56	D2
EPA 7471A	Mercury	0.015	mg/kg	0.033	0.011		X322043	JRR	05/31/23 14:11	H1,J

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Dave Tryon
Project Manager



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Work Order: **X3E0341**

Reported: 28-Jun-23 10:02

Client Sample ID: **SS-7-1-2'**

Sampled: 02-May-23 13:08

Received: 18-May-23

Sampled By: TJ

SVL Sample ID: **X3E0341-09 (Soil)**

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals by EPA 6000/7000 Series (Sieved)										
EPA 6020B	Arsenic	11.9	mg/kg	0.300	0.0118	2	X322014	SMU	06/01/23 10:42	
EPA 6020B	Cadmium	0.257	mg/kg	0.100	0.072	2	X322014	SMU	06/01/23 10:42	
EPA 6020B	Lead	283	mg/kg	16.0	10.4	200	X322014	SMU	06/01/23 14:04	D2
EPA 6020B	Zinc	201	mg/kg	80.0	64.0	200	X322014	SMU	06/01/23 11:58	D2
EPA 7471A	Mercury	0.033	mg/kg	0.033	0.011		X322043	JRR	05/31/23 14:18	H1

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Dave Tryon
Project Manager



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Work Order: **X3E0341**

Reported: 28-Jun-23 10:02

Client Sample ID: **SS-5-2-3'**

Sampled: 02-May-23 11:13

Received: 18-May-23

Sampled By: TJ

SVL Sample ID: **X3E0341-10 (Soil)**

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals by EPA 6000/7000 Series (Sieved)										
EPA 6020B	Arsenic	6.96	mg/kg	0.300	0.0118	2	X322014	SMU	06/01/23 10:44	
EPA 6020B	Cadmium	0.189	mg/kg	0.100	0.072	2	X322014	SMU	06/01/23 10:44	
EPA 6020B	Lead	17.1	mg/kg	1.60	1.04	20	X322014	SMU	06/01/23 14:05	D2
EPA 6020B	Zinc	73.8	mg/kg	8.00	6.40	20	X322014	SMU	06/01/23 12:00	D2
EPA 7471A	Mercury	< 0.011	mg/kg	0.033	0.011		X322043	JRR	05/31/23 14:20	H1,U

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Dave Tryon
Project Manager



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Work Order: **X3E0341**

Reported: 28-Jun-23 10:02

Client Sample ID: **SS-2-1-2'**

Sampled: 02-May-23 09:37

Received: 18-May-23

Sampled By: TJ

SVL Sample ID: **X3E0341-11 (Soil)**

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals by EPA 6000/7000 Series (Sieved)										
EPA 6020B	Arsenic	40.9	mg/kg	300	11.8	2000	X322014	SMU	06/01/23 12:02	D2,J
EPA 6020B	Cadmium	0.450	mg/kg	0.100	0.072	2	X322014	SMU	06/01/23 10:46	
EPA 6020B	Lead	2710	mg/kg	160	104	2000	X322014	SMU	06/01/23 14:07	D2
EPA 6020B	Zinc	3340	mg/kg	800	640	2000	X322014	SMU	06/01/23 12:02	D2
EPA 7471A	Mercury	0.058	mg/kg	0.033	0.011		X322043	JRR	05/31/23 14:22	H1

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Dave Tryon
Project Manager



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Work Order: **X3E0341**

Reported: 28-Jun-23 10:02

Client Sample ID: **SS-5-1-2'**

Sampled: 02-May-23 11:10

Received: 18-May-23

Sampled By: TJ

SVL Sample ID: **X3E0341-12 (Soil)**

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals by EPA 6000/7000 Series (Sieved)										
EPA 6020B	Arsenic	10.4	mg/kg	0.300	0.0118	2	X322014	SMU	06/01/23 10:48	
EPA 6020B	Cadmium	0.227	mg/kg	0.100	0.072	2	X322014	SMU	06/01/23 10:48	
EPA 6020B	Lead	309	mg/kg	16.0	10.4	200	X322014	SMU	06/01/23 14:08	D2
EPA 6020B	Zinc	1080	mg/kg	80.0	64.0	200	X322014	SMU	06/01/23 12:04	D2
EPA 7471A	Mercury	0.039	mg/kg	0.033	0.011		X322043	JRR	05/31/23 14:24	H1

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Dave Tryon
Project Manager



Alta Science and Engineering - Moscow

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Work Order: **X3E0341**

Reported: 28-Jun-23 10:02

Client Sample ID: **SS-4-1-2'**

Sampled: 02-May-23 10:40

Received: 18-May-23

Sampled By: TJ

SVL Sample ID: **X3E0341-13 (Soil)**

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals by EPA 6000/7000 Series (Sieved)										
EPA 6020B	Arsenic	4.73	mg/kg	0.300	0.0118	2	X322014	SMU	06/01/23 10:50	
EPA 6020B	Cadmium	0.262	mg/kg	0.100	0.072	2	X322014	SMU	06/01/23 10:50	
EPA 6020B	Lead	194	mg/kg	16.0	10.4	200	X322014	SMU	06/01/23 14:09	D2
EPA 6020B	Zinc	85.2	mg/kg	80.0	64.0	200	X322014	SMU	06/01/23 12:06	D2
EPA 7471A	Mercury	0.032	mg/kg	0.033	0.011		X322043	JRR	05/31/23 14:26	H1,J

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Dave Tryon
Project Manager



Alta Science and Engineering - Moscow

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Work Order: **X3E0341**

Reported: 28-Jun-23 10:02

Client Sample ID: **SS-3-1-2'**

Sampled: 02-May-23 10:20

Received: 18-May-23

Sampled By: TJ

SVL Sample ID: **X3E0341-14 (Soil)**

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals by EPA 6000/7000 Series (Sieved)										
EPA 6020B	Arsenic	36.9	mg/kg	300	11.8	2000	X322014	SMU	06/01/23 12:08	D2,J
EPA 6020B	Cadmium	0.708	mg/kg	0.100	0.072	2	X322014	SMU	06/01/23 10:52	
EPA 6020B	Lead	6600	mg/kg	160	104	2000	X322014	SMU	06/01/23 14:11	D2
EPA 6020B	Zinc	5490	mg/kg	800	640	2000	X322014	SMU	06/01/23 12:08	D2
EPA 7471A	Mercury	0.052	mg/kg	0.033	0.011		X322043	JRR	05/31/23 14:28	H1

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Dave Tryon
Project Manager



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Moscow, ID 83843

Work Order: **X3E0341**

Reported: 28-Jun-23 10:02

Client Sample ID: **SS-4-2-3'**

SVL Sample ID: **X3E0341-15 (Soil)**

Sampled: 02-May-23 10:46

Received: 18-May-23

Sampled By: TJ

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals by EPA 6000/7000 Series (Sieved)										
EPA 6020B	Arsenic	2.50	mg/kg	0.300	0.0118	2	X322014	SMU	06/01/23 10:55	
EPA 6020B	Cadmium	0.097	mg/kg	0.100	0.072	2	X322014	SMU	06/01/23 10:55	J
EPA 6020B	Lead	3.76	mg/kg	0.100	0.052		X322014	SMU	06/01/23 14:12	
EPA 6020B	Zinc	24.3	mg/kg	8.00	6.40	20	X322014	SMU	06/01/23 12:17	D2
EPA 7471A	Mercury	< 0.011	mg/kg	0.033	0.011		X322043	JRR	05/31/23 14:31	H1,U

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Dave Tryon
Project Manager



Alta Science and Engineering - Moscow

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Moscow, ID 83843

Work Order: **X3E0341**

Reported: 28-Jun-23 10:02

Client Sample ID: **RB-1**

Sampled: 02-May-23 17:30

Received: 18-May-23

Sampled By:

SVL Sample ID: **X3E0341-16 (Water)**

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 7470A	Mercury	< 0.000093	mg/L	0.000200	0.000093		X322046	JRR	05/30/23 15:55	U
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Metals (Total Recoverable)

EPA 6020B	Arsenic	0.00051	mg/L	0.00300	0.00021		X322094	SMU	06/01/23 12:43	J
EPA 6020B	Cadmium	< 0.000063	mg/L	0.000200	0.000063		X322094	SMU	06/01/23 12:43	U
EPA 6020B	Lead	< 0.00014	mg/L	0.00100	0.00014		X322094	SMU	06/01/23 13:51	U
EPA 6020B	Zinc	< 0.0020	mg/L	0.0050	0.0020		X322094	SMU	06/01/23 12:43	U

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Dave Tryon
Project Manager



Alta Science and Engineering - Moscow

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Moscow, ID 83843

Work Order: **X3E0341**

Reported: 28-Jun-23 10:02

Client Sample ID: **SS-16-1-2'**

SVL Sample ID: **X3E0341-17 (Soil)**

Sampled: 02-May-23 12:15

Received: 18-May-23

Sampled By: TJ

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals by EPA 6000/7000 Series (Sieved)										
EPA 6020B	Arsenic	10.0	mg/kg	0.300	0.0118	2	X322014	SMU	06/01/23 11:14	
EPA 6020B	Cadmium	0.287	mg/kg	0.100	0.072	2	X322014	SMU	06/01/23 11:14	
EPA 6020B	Lead	34.1	mg/kg	16.0	10.4	200	X322014	SMU	06/01/23 12:19	D2
EPA 6020B	Zinc	165	mg/kg	80.0	64.0	200	X322014	SMU	06/01/23 12:19	D2
EPA 7471A	Mercury	0.014	mg/kg	0.033	0.011		X322043	JRR	05/31/23 14:33	H1,J

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Dave Tryon
Project Manager



Alta Science and Engineering - Moscow

220 E. 5th St, Ste 325
Moscow, ID 83843

Work Order: **X3E0341**
Reported: 28-Jun-23 10:02

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Metals (Total)								
EPA 7470A	Mercury	mg/L	<0.000093	0.000093	0.000200	X322046	30-May-23	U
Metals by EPA 6000/7000 Series								
EPA 6020B	Arsenic	mg/kg	<0.0118	0.0118	0.300	X322014	01-Jun-23	U
EPA 6020B	Cadmium	mg/kg	<0.072	0.072	0.080	X322014	01-Jun-23	U
EPA 6020B	Lead	mg/kg	<0.104	0.104	0.160	X322014	01-Jun-23	U
EPA 6020B	Zinc	mg/kg	<0.004	0.004	0.008	X322014	01-Jun-23	U
EPA 7471A	Mercury	mg/kg	<0.011	0.011	0.033	X322043	31-May-23	U
Metals (Total Recoverable)								
EPA 6020B	Arsenic	mg/L	<0.00021	0.00021	0.00100	X322094	01-Jun-23	U
EPA 6020B	Cadmium	mg/L	<0.000063	0.000063	0.000100	X322094	01-Jun-23	U
EPA 6020B	Lead	mg/L	<0.00014	0.00014	0.00020	X322094	01-Jun-23	U
EPA 6020B	Zinc	mg/L	<0.0020	0.0020	0.0040	X322094	01-Jun-23	U

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total)									
EPA 7470A	Mercury	mg/L	0.00230	0.00200	115	80 - 120	X322046	30-May-23	
Metals by EPA 6000/7000 Series									
EPA 6020B	Arsenic	mg/kg	2.24	2.50	89.8	80 - 120	X322014	01-Jun-23	
EPA 6020B	Cadmium	mg/kg	2.35	2.50	94.1	80 - 120	X322014	01-Jun-23	
EPA 6020B	Lead	mg/kg	2.58	2.50	103	80 - 120	X322014	01-Jun-23	
EPA 6020B	Zinc	mg/kg	2.09	2.50	83.5	80 - 120	X322014	01-Jun-23	
EPA 7471A	Mercury	mg/kg	0.338	0.333	101	80 - 120	X322043	31-May-23	
Metals (Total Recoverable)									
EPA 6020B	Arsenic	mg/L	0.0245	0.0250	98.1	80 - 120	X322094	01-Jun-23	
EPA 6020B	Cadmium	mg/L	0.0243	0.0250	97.2	80 - 120	X322094	01-Jun-23	
EPA 6020B	Lead	mg/L	0.0237	0.0250	94.9	80 - 120	X322094	01-Jun-23	
EPA 6020B	Zinc	mg/L	0.0230	0.0250	92.1	80 - 120	X322094	01-Jun-23	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch and Source ID	Analyzed	Notes
Metals (Total)										
EPA 7470A	Mercury	mg/L	0.00227	<0.000093	0.00200	114	75 - 125	X322046 - X3E0341-16	30-May-23	
Metals by EPA 6000/7000 Series										
EPA 6020B	Arsenic	mg/kg	4.60	2.30	2.50	91.8	75 - 125	X322014 - X3E0341-01	01-Jun-23	
EPA 6020B	Cadmium	mg/kg	2.46	0.171	2.50	91.7	75 - 125	X322014 - X3E0341-01	01-Jun-23	
EPA 6020B	Lead	mg/kg	31.1	28.8	2.50	92.2	75 - 125	X322014 - X3E0341-01	01-Jun-23	D2
EPA 6020B	Zinc	mg/kg	44.7	43.6	2.50	0.30R>S	75 - 125	X322014 - X3E0341-01	01-Jun-23	D2,M4
EPA 7471A	Mercury	mg/kg	0.347	<0.011	0.333	104	75 - 125	X322043 - X3E0341-01	31-May-23	H1
Metals (Total Recoverable)										
EPA 6020B	Arsenic	mg/L	0.0238	0.00051	0.0250	93.3	75 - 125	X322094 - X3E0341-16	01-Jun-23	
EPA 6020B	Cadmium	mg/L	0.0239	<0.000063	0.0250	95.7	75 - 125	X322094 - X3E0341-16	01-Jun-23	

SVL holds the following certifications:

AZ:0538, ID:ID00019, NV:ID000192007A, UT(TNI):ID000192015-1, WA:C573



Alta Science and Engineering - Moscow

220 E. 5th St, Ste 325
Moscow, ID 83843

Work Order: **X3E0341**
Reported: 28-Jun-23 10:02

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch and Source ID	Analyzed	Notes
--------	---------	-------	--------------	-------------------	-----------------	--------	-------------------	---------------------	----------	-------

Metals (Total Recoverable) (Continued)

EPA 6020B	Lead	mg/L	0.0241	<0.00014	0.0250	96.4	75 - 125	X322094 - X3E0341-16	01-Jun-23	
EPA 6020B	Zinc	mg/L	0.0219	<0.002	0.0250	87.8	75 - 125	X322094 - X3E0341-16	01-Jun-23	

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	% Recovery	Batch and Source ID	Notes
--------	---------	-------	------------	--------------	-------------	-----	-----------	------------	---------------------	-------

Metals (Total)

EPA 7470A	Mercury	mg/L	0.00224	0.00227	0.00200	1.3	20	112	X322046 - X3E0341-16	
-----------	---------	------	---------	---------	---------	-----	----	-----	----------------------	--

Metals by EPA 6000/7000 Series

EPA 6020B	Arsenic	mg/kg	4.68	4.60	2.50	1.7	20	95.0	X322014 - X3E0341-01	
EPA 6020B	Cadmium	mg/kg	2.59	2.46	2.50	5.1	20	96.8	X322014 - X3E0341-01	
EPA 6020B	Lead	mg/kg	42.7	31.1	2.50	31.4	20	0.30R>S	X322014 - X3E0341-01	D2,M4,R2B
EPA 6020B	Zinc	mg/kg	48.7	44.7	2.50	8.5	20	0.30R>S	X322014 - X3E0341-01	D2,M4
EPA 7471A	Mercury	mg/kg	0.349	0.347	0.333	0.7	20	105	X322043 - X3E0341-01	H1

Metals (Total Recoverable)

EPA 6020B	Arsenic	mg/L	0.0235	0.0238	0.0250	1.3	20	92.1	X322094 - X3E0341-16	
EPA 6020B	Cadmium	mg/L	0.0234	0.0239	0.0250	2.3	20	93.5	X322094 - X3E0341-16	
EPA 6020B	Lead	mg/L	0.0248	0.0241	0.0250	2.9	20	99.3	X322094 - X3E0341-16	
EPA 6020B	Zinc	mg/L	0.0215	0.0219	0.0250	2.1	20	85.9	X322094 - X3E0341-16	

Quality Control - SERIAL DILUTION Data

Method	Analyte	Sample Result	Serial Dilution Result	RPD	Q	QC Limits	Batch and Source ID	Notes
--------	---------	---------------	------------------------	-----	---	-----------	---------------------	-------

Metals by EPA 6000/7000 Series

EPA 6020B	Lead	31.1	30.3	2.8		20	X322014 - MS1	
EPA 6020B	Zinc	44.7	42.5	5.2		20	X322014 - MS1	



Alta Science and Engineering - Moscow

220 E. 5th St, Ste 325

Moscow, ID 83843

Work Order:

X3E0341

Reported:

28-Jun-23 10:02

Notes and Definitions

D2	Sample required dilution due to high concentration of target analyte.
H1	Sample analysis performed past holding time.
J	The reported value is less than the Reporting Limit (MRL, CRDL) but greater than or equal to the MDL. Results closer to the MDL have increased relative uncertainty.
M4	The analysis of the spiked sample required a dilution such that the spike recovery calculation does not provide useful information. The LCS recovery was acceptable.
R2B	RPD exceeded the laboratory acceptance limit.
U	Less than MDL.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
0.30R>S	% recovery not applicable; spike level is less than 30% of the sample concentration
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable



RD

8) 784-1258 • FAX: (208) 783-0891

SVL



FOR SVL USE ONLY
SVL Work Order #
 Temperature on Receipt: 17.8^oc

Report to Company: ALTA-SE
Contact: SARAH WEPPNER
Address: 220 EAST 5TH ST. SUITE 325
MOSCOW, ID 83843
Phone Number: 208-882-7858
FAX Number: -
E-mail: SARAH.WEPPNER@ALTA-SE.COM

Invoice Sent To: ACCOUNTING@ALTA-SE.COM
Contact: JILL DORSEY@ALTA-SE.COM
Address: 220 EAST 5TH ST. SUITE 325
MOSCOW, ID 83843
Phone Number: 208-882-7858
FAX Number: -
PO#: 22148-30

Table 1. - Matrix Type
 1 = Surface Water, 2 = Ground Water
 3 = Soil, 4 = Sediment, 5 = Rock, 6 = Rinsate, 7 = Oil
 8 = Waste, 9 = Other: _____

Project Name: POBT ZONE 4 PROPERTY

Sampler's Signature: Thomas Jenkins

Indicate State of sample origination: ID

Sample ID	Collection		Misc.	Preservative(s)							Analyses Required	Rush Instructions (Days)	Comments				
	Date	Time		Collected by: (Init.)	Matrix Type (From Table 1)	No. of Containers	Unpreserved	HNO ₃ Filtered	HNO ₃ Unfiltered	HCl				H ₂ SO ₄	NaOH	Other (Specify)	
1	SS-1-1-2'	5/2/23 8:16	TJ	3	1	/											
2	SS-12-1-2'	5/2/23 15:41	TJ	3	1	/											
3	SS-10-0-1'	5/2/23 15:05	TJ	3	1	/											
4	SS-9-0-1'	5/2/23 14:37	TJ	3	1	/											
5	SS-12-2-3'	5/2/23 15:45	TJ	3	1	/											
6	SS-12-0-1'	5/2/23 15:35	TJ	3	1	/											
7	SS-11-0-1'	5/2/23 15:15	TJ	3	1	/											
8	SS-6-1-2'	5/2/23 12:15	TJ	3	1	/											
9	SS-7-1-2'	5/2/23 1:08	TJ	3	1	/											
10	SS-5-2-3'	5/2/23 11:13	TJ	3	1	/											

Handwritten notes in table:
 As, Cd, Pb, Zn, USEPA 6020
 SIEVE 80 MESH [180µm]
 Hg USEPA 7471A

Relinquished by: Tom Jenkins Thomas Jenkins Date: 5/14/23 Time: 15:00 Received by: [Signature] Date: 5/18/23 Time: 1040

* Sample Reject: Return Dispose Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY



D

1) 784-1258 • FAX: (208) 783-0891

SVL Ar

FOR SVL USE ONLY
 SVL Work Order #
 Temperature on Receipt: 17.8°C

Report to Company: ALTA-SE
 Contact: SARAH WEPPNER
 Address: 220 EAST 5TH ST. SUITE 325
MOSCOW, ID 83843
 Phone Number: 208-882-7858
 FAX Number:
 E-mail: SARAH.WEPPNER@ALTA-SE.COM

Invoice Sent To: ACCOUNTING@ALTA-SE.COM
 Contact: JILL DORSEY@ALTA-SE.COM
 Address: 220 EAST 5TH ST. SUITE 325
MOSCOW, ID 83843
 Phone Number: 208-882-7858
 FAX Number:
 PO#: 22148-30

Table 1. - Matrix Type
 1 = Surface Water, 2 = Ground Water
 3 = Soil, 4 = Sediment, 5 = Rock, 6 = Rinsate, 7 = Oil
 8 = Waste, 9 = Other:

Project Name: POBT ZONE 4 PROPERTY
 Sampler's Signature: Thomas Jenkins

Indicate State of sample origination: ID

Sample ID	Collection		Misc.	Preservative(s)							Analyses Required	Rush Instructions (Days)	Comments				
	Date	Time		Collected by: (Init.)	Matrix Type (From Table 1)	No. of Containers	Unpreserved	HNO ₃ Filtered	HNO ₃ Unfiltered	HCl				H ₂ SO ₄	NaOH	Other (Specify)	
1	SS-2-1-2'	5/2/23 9:37	TS	3	1	/											
2	SS-5-1-2'	5/2/23 11:10	TS	3	1	/											
3	SS-4-1-2'	5/2/23 10:40	TS	3	1	/											
4	SS-3-1-2'	5/2/23 10:20	TS	3	1	/											
5	SS-4-2-3'	5/2/23 10:46	TS	3	1	/											
6	RB-1	5/2/23 17:30	TS	6	1	/											
7	SS-16-1-2'	5/2/23 12:15	TS	3	1	/											
8																	
9																	
10																	

Relinquished by: Tom Jenkins Date: 5/16/23 Time: 15:00 Received by: [Signature] Date: 5/18/23 Time: 1040
 Relinquished by: Date: Time: Received by: Date: Time:

* Sample Reject: Return Dispose Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY

SAMPLE RECEIPT/CHAIN-OF-CUSTODY CHECKLIST

The following items were checked for completeness, correctness, and compliance to project specifications using the Chain-of-Custody (COC) and other supporting information.

Date of acceptance: 5/19/23 By: Melissa D
 SVL Work No: X3E0341

Item	Description	V	NA	Comments
1	Client or project name	✓		MTA
2	Date and time of receipt at lab	✓		5/18/23 1040
3	Received by	✓		MB
4	Temperature blank or cooler temperature	✓		Temp. 7.8°C T098/T126
5	Were the sample(s) received on ice	✓		melted
6	Custody tape/bottle seals	✓		
7	Shipper's air bill	✓		FedEx 398373726754
8	Condition of samples upon receipt (leaking; bubbles in VOA vials)	✓		
9	Analysis requested for each sample	✓		
10	Sample matrix description	✓		
11	The correct preservative for the analysis requested	✓		
12	Did an SVL employee preserve sample(s) upon receipt		✓	
13	Additional Information		✓	

V- Verified NA- Not Applicable

Comments:

Appendix D
QA/QC Memorandum

INTERNAL MEMORANDUM

To: Derek Forseth, Project Manager
Sarah Weppner, Quality Assurance Officer

From: Allison Marshall, Data Validator
Rachel Gibeault, Data Validator

Date: July 12, 2023

Contract No./Title: K305 / Task Order No. 51

Alta Project No.: 22148

Subject: **QA/QC Review of the May 2023 Sampling Event at the Panhandle Smelting and Refining Company Site**

1 Introduction

This memorandum provides a summary of the data validation and data quality assessment performed on the sample results for the sediment sampling effort that occurred on May 2, 2023, at the Panhandle Smelting and Refining Company (PSRC) Site located on the northern shoreline of Lake Pend Oreille, Ponderay, Idaho. Alta Science & Engineering, Inc.'s (Alta's) quality assurance/quality control (QA/QC) review followed guidelines set forth in the following documents:

- *Site Assessment Quality Assurance Project Plan [QAPP] for the Panhandle Smelting and Refining Company, Ponderay, Idaho (Alta 2023a)*
- *Addendum to the Site Assessment Quality Assurance Project Plan for the Panhandle Smelting and Refining Company, Ponderay, Idaho (Alta 2023b)*
- *National Functional Guidelines for Inorganic Superfund Methods Data Review (USEPA 2020)*
- *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use (USEPA 2009)*
- *USEPA Guidance on Environmental Data Verification and Data Validation (USEPA 2002)*

This memorandum discusses the data validation and quality assessment performed for the Sample Delivery Group (SDG) or Work Orders listed in Table 1. Data qualifiers used in this review are defined by the U.S. Environmental Protection Agency (USEPA 2020).

Table 1. Sample Delivery Group Data Validation

Laboratory	SDG / Work Order	Analysis	Matrix	Data Validation Level (USEPA 2009)	Review Conducted by
SVL ^a	X3E0341 - 2	total metals ^b	Sediment (soil)	Stage 2A	Alta data validator

Footnotes:

^a SVL Analytical, Inc, Kellogg, ID^b total metals target analytes (after sieving with 80 mesh in the laboratory): arsenic, cadmium, lead, and zinc analyzed using USEPA Method 6020B (USEPA 2014); with mercury using USEPA Method 7471 (USEPA 1994a, 1994b).

2 Data Validation and Quality Assessment Summary of Soil Results

Alta's Stage 2A validation of the analytical data and review of the field data are summarized in Table 2. Procedures/checks that require further discussion are explained below the table, as necessary.

Table 2. Data Quality Review Summary for Soil Samples

Data Validation Procedure of Check	Acceptable Frequency? ^a	Acceptable Performance? ^b	Data Qualified?	Discussion Item Number
Sample condition upon receipt at laboratory	--	Y	N	
Preservation	--	N	Y	1
Laboratory followed specified analytical methods and shows analysis dates	--	Y	N	
Holding times	--	N	Y	2
Requested target analyte results are reported with lab qualifiers and units	--	Y	N	
Requested reporting limits are present	--	N	N	3
Method Blanks	Y	Y	N	
Surrogate Recoveries/ Deuterated Monitoring Compounds Recoveries	-	-	-	
Matrix Spikes (MS)	Y	N	N	4
Laboratory Control Samples (LCS)	Y	Y	N	
Matrix Spike Duplicates (MSD)	Y	N	N	5

Table 2. Data Quality Review Summary for Soil Samples

Data Validation Procedure of Check	Acceptable Frequency? ^a	Acceptable Performance? ^b	Data Qualified?	Discussion Item Number
Trip Blank	-	-	-	
Field Blank	N	N	Y	6
Field Duplicates (Table 4)	Y	Y	Y	7

^a Frequencies as defined in the QAPP (Alta 2023a) or QAPP Addendum (Alta 2023b).

^b As defined in the QAPP (Alta 2023a), QAPP Addendum (Alta 2023b) or based on professional judgment of the data validator.

-- = not applicable

Discussion Item

- Preservation:** The samples were received by the laboratory at a temperature of 17.8°C. Per the National Functional Guidelines for Inorganics, sediment samples to be analyzed for mercury should be maintained at ≤ 6°C (USEPA 2020). Detected concentrations of mercury in samples SS-2-1-2', SS-3-1-2', SS-4-1-2', SS-5-1-2', SS-6-1-2', SS-7-1-2', SS-9-0-1', and SS-16-1-2' are qualified as estimated with a low bias (J-). Mercury was not detected above the method detection limit (MDL) in samples SS-1-1-2', SS-4-2-3', SS-5-2-3', SS-10-0-1', SS-11-0-1', SS-12-0-1', SS-12-1-2', and SS-12-2-3'. Based on the National Functional Guidelines for Inorganics: mercury (USEPA 2020), these non-detect mercury results are rejected (R).
- Holding times:** The samples were collected on May 2, 2023. Mercury analysis was conducted on May 31, 2023, which is 29 days later. The National Functional Guidelines for Inorganics state that the hold time for mercury analysis is 28 days (USEPA 2020). Samples SS-2-1-2', SS-3-1-2', SS-4-1-2', SS-5-1-2', SS-6-1-2', SS-7-1-2', and SS-9-0-1' are qualified as estimated with a low bias (J-) for mercury. Mercury was not detected above the MDL in samples SS-1-1-2', SS-4-2-3', SS-5-2-3', SS-10-0-1', SS-11-0-1', SS-12-0-1', SS-12-1-2', and SS-12-2-3'. Based on the National Functional Guidelines for Inorganics: mercury (USEPA 2020), the non-detect mercury results in these samples are rejected (R).
- Requested reporting limits are present:** Comparing the reporting limits (RLs) or MDLs to the screening levels (SLs) helps ensure that the sensitivity of the study meets the data quality objectives for the project. The following instances show where both the RL and the MDL exceed the SL:
 - Samples SS-2-1-2' and SS-3-1-2' were raised by a factor of 2,000 due to dilution during analysis of arsenic. As a result, the MDL and RL for arsenic (11.8 milligrams per kilogram [mg/kg] and 300 mg/kg, respectively) exceed the SL (0.68 mg/kg). However, in these samples, arsenic was detected above the SL. The laboratory qualified the results as estimated (J) due to the concentrations being below the RL but above the MDL. No additional qualifications are necessary.
- Matrix Spikes (MS):** A MS sample has a known amount of the target analyte added to the project matrix before analysis to assess possible matrix interferences on the analysis. Percent recoveries (%Rs) on MS samples should be compared to %Rs of laboratory control samples (LCS). From a total of 15 field samples, the Alta field crew collected 1 site-specific MS/matrix spike duplicate (MSD) sample from location SS-1-1-2', which meets the QAPP Addendum frequency of 1:20 samples (Alta 2023b).

Most %Rs for the MS sediment sample are within laboratory and QAPP (Alta 2023a) limits except for zinc. The zinc sample concentration is greater than four times the spike amount; therefore, accurate spike recovery could be evaluated. However, the LCS %R is within acceptable limits; therefore, no qualification is necessary.

5. **Matrix Spike Duplicate:** Most relative percent differences (RPDs) for the site-specific MSD sediment sample were within laboratory and QAPP (Alta 2023a) limits except for lead. The lead RPD (31.4%) exceeded the upper limit of 20% as defined in the QAPP (Alta 2023a). The detected lead result in the site-specific MS/MSD sample (SS-1-1-2') will be qualified as estimated (J), based on the National Functional Guidelines for Inorganics: ICP-MS (USEPA 2020). Considering the variability in lake shore sediments and the spatial distribution of the sampling locations, the samples are not considered to be from a uniform or homogeneous matrix; therefore, only the site-specific MS/MSD sample is qualified.
6. **Field Blank:** The Alta field crew did not collect a field blank per the QAPP Addendum (Alta 2023b). However, the field crew did collect one rinsate blank labeled RB-1. Rinsate blanks are blank sample matrix passed through or over non-dedicated sampling equipment to check the decontamination process between samples or sample sites. While the QAPP Addendum called for one field blank (Alta 2023b), based on professional judgement, the use of a rinsate blank in this case meets the intended purpose of the QA criteria of assessing the possibility of contamination during field methods. None of the analytes were detected above the MDL except arsenic (Table 3). Because arsenic was detected above the MDL but below the RL, all sample results for arsenic that were detected above the RL will be qualified as estimated with a high bias (J+) per the National Functional Guidelines for Inorganics: ICP-MS (USEPA 2020).

Table 3. Rinsate Blank Analysis

Sample ID	Sample Date	Analyte	Reported Concentration (mg/L)
RB-1	5/2/2023	total mercury	0.000093 U
		total arsenic	0.00051 J
		total cadmium	0.000063 U
		total lead	0.00014 U
		total zinc	0.0020 U

mg/L = milligrams per liter

J = result is an estimate

U = not detected above the method detection limit

7. **Field Duplicate:** One field duplicate (sample SS-16-1-2') was collected as a duplicate of sample SS-6-1-2', which satisfies the QAPP Addendum requirement of 1 duplicate per 20 samples (Alta 2023b). Results of the field duplicate analyses are shown in Table 4. Most original and duplicate analyte concentrations were less than 5 times the RL; therefore, the RPD was not calculated for these analytes. Instead, the difference between the original and duplicate concentrations was compared to the RL based on the National Functional Guidelines for Inorganics (USEPA 2020) as discussed below:
 - a. For analysis of lead and zinc, the original and duplicate sample results were less than 5 times the RL. The absolute difference between the original and duplicate concentrations was greater than the RL; therefore, based on the National

Functional Guidelines for Inorganics: ICP-MS, lead and zinc are qualified as estimated (J) in the original and duplicate samples. Considering the variability in lake shore sediments and the spatial distribution of the sampling locations, the samples are not considered to be from a uniform or homogeneous matrix; therefore, only the original and duplicate samples are qualified.

- b. For analysis of mercury, the original and duplicate sample results were less than 5 times the RL and the absolute difference between the original and duplicate concentration was less than the RL; therefore, based on the National Functional Guidelines for Inorganics: mercury, no additional qualification is needed.

Table 4. Field Duplicate Analysis for Sediment

Sample ID	Sample Date	Analyte	Original Concentration (mg/kg)		Duplicate Concentration (mg/kg)		RPD
SS-6-1-2/ SS-16-1-2	5/2/2023	arsenic	9.70	J+	10.0	J+	3%
		cadmium	0.280		0.287		NC
		lead	76.3		34.1		NC
		zinc	356		165		NC
		mercury	0.0150	J-	0.014	J-	NC

Relative Percent Difference (RPD) = $|X1-X2|/((X1+X2)/2)*100$

Where: X1 = Original Concentration and X2 = Duplicate Concentration

NC = Non-calculable; original or duplicate concentrations were less than 5x analyte-specific reporting limits (USEPA 2020)

mg/kg = milligrams per kilogram

J- = the result is estimated with a low bias

J+ = the result is estimated with a high bias

3 Overall Assessment

Based on this data quality review, Alta determines the laboratory and field data to be of acceptable quality except for the qualifications that are discussed below.

3.1 Sample Handling and Custody

Alta's Quality Assurance Officer (QAO) qualified the following data based on sample handling and custody:

- Samples SS-2-1-2', SS-3-1-2', SS-4-1-2', SS-5-1-2', SS-6-1-2', SS-7-1-2', SS-9-0-1', and SS-16-1-2' are qualified as estimated with a low bias (J-) for mercury due to the samples not being maintained $\leq 6^{\circ}\text{C}$ and being analyzed past the 28-day hold time.
- Samples SS-1-1-2', SS-4-2-3', SS-5-2-3', SS-10-0-1', SS-11-0-1', SS-12-0-1', SS-12-1-2', and SS-12-2-3' are rejected (R) for mercury due to the samples not being maintained $\leq 6^{\circ}\text{C}$ and being analyzed past the 28-day hold time.

3.2 Data Accuracy and Precision

3.2.1 Accuracy

Alta's QAO did not qualify any data based on percent recovery results (LCS and MS).

3.2.2 Precision

Alta's QAO qualified the following data based on precision results (MSD or field duplicate):

- Lead is qualified as estimated (J) in sample SS-1-1-2' based on high MSD RPD.
- Lead and zinc are qualified as estimated (J) in sample SS-6-1-2' and its duplicate sample SS-16-1-2'. While the RPD was not calculated for these analytes due to the concentrations being < 5 times the RL, the absolute difference between the original and duplicate concentrations was greater than the RL.

3.3 Data Sensitivity

Method blanks and rinsate blanks were utilized to assess sample collection and decontamination methods in the field and laboratory. The following data is qualified based on detections in the rinsate blank sample:

- All samples were qualified as estimated with a high bias (J+) for arsenic due to a detection in the rinsate blank.

It should be noted that one or more sample and/or QC results were flagged "R2B," "M4," or "H1," by the laboratory to indicate QC parameters that did not meet the laboratory or method QC criteria. These flags are qualitative and do not necessarily indicate that a data validation qualifier should be assigned. Except for "J" flags, laboratory-assigned qualifiers are for informational purposes only. Data validation qualifiers, if assigned, supersede the laboratory-assigned flags.

3.4 Data Usability

The Alta QAO rejected 8 sample results out of a possible 75; therefore, according to the QAPP (Alta 2023a), the completeness for this sampling event is calculated at 89%, which does not meet the data quality objective of 90%.

4 References and Resources Used

Alta Science & Engineering, Inc. (Alta), 2023a. Site Assessment Quality Assurance Project Plan for the Panhandle Smelting and Refining Company, Ponderay, Idaho. Prepared for the City of Ponderay. January 26.

Alta, 2023b. "Addendum to the Site Assessment Quality Assurance Project Plan for the Panhandle Smelting and Refining Company, Ponderay, Idaho." Memorandum addressed to S.Gill (IDEQ). April 11.

USEPA, 1994a. Method 7471A (SW-846): Mercury in Solid or Semisolid Waste (Manual Cold-vapor Technique). Revision 1, September.

USEPA, 1994b. Method 7470A (SW-846): Mercury in Liquid Waste (Manual Cold-vapor Technique). Revision 1, September.

USEPA, 2002. USEPA Guidance on Environmental Data Verification and Data Validation. USEPA QA/G-8; November.

USEPA, 2009. Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use. OSWER No. 9200.1-85, USEPA 540-R-08-005 prepared by the Office of Solid Waste and Emergency Response; January.

USEPA, 2014. Method 6020B: Inductively Coupled Plasma-Mass Spectrometry. Revision 2, July.

USEPA, 2020. National Functional Guidelines for Inorganic Superfund Methods Data Review, Office of Superfund Remediation and Technology Innovation (OSRTI). OLEM 9240.1-66, USEPA-542-R-20-006; November.

Appendix E
Archaeological Monitoring report

**ARCHAEOLOGICAL MONITORING OF SOIL TESTING AT THE PANHANDLE
SMELTING AND REFINING COMPANY SITE (10BR539), NEAR PONDERAY,
IDAHO, IN MAY 2023**

By Robert Lee Sappington

27 June 2023

Introduction

Alta Science & Engineering, Inc. (Alta) is working with the City of Ponderay (City) to develop a public park adjacent to Lake Pend Oreille at the location of the former Panhandle Smelting and Refining Company (PSRC) site. Prior to development of the park, Alta and the City are conducting a series of soil tests. After reviewing a description of the planned undertaking, the Idaho State Historic Preservation Office (SHPO) recommended that an archaeologist monitor all ground-disturbing excavation associated with soil testing in the vicinity of the PSRC site. Monitoring was previously conducted at the site in November 2011 (Sappington and Longstaff 2012a) and again in May 2012 (Sappington and Longstaff 2012b) prior to the development of the adjacent Pend Oreille Bay Trail. At that time historic cultural resources were encountered in 16 of the 19 test pits and it was evident that historic artifacts and features are frequent in the vicinity of the site.

The PSRC site is an inactive facility located approximately 400 feet south of the City of Ponderay. The PSRC site consists of original smelter ruins, a small pile of unprocessed ore, several building depressions, and a slag dump. The slag dump is a local landmark known as Black Rock and it is weathering onto the shore of the lake.

The PSRC site was recorded as archaeological site 10BR539 in 1985 (Miss and Hudson 1986). Prior to a modification of a railroad grade, the U. S. Army Corps of Engineers, Seattle District (COE), requested an evaluation of the site to determine its eligibility for nomination to the National Register of Historic Places (Renk 2001). That report provides an excellent history of the smelter and the author concluded that 10BR539 was eligible for the National Register of Historic Places under criteria A and D (Renk 2001).

Access to the PSRC site is from the adjacent trail which has increased pedestrian and vehicle traffic to the area which has become a popular swimming and recreation destination during the summer. There are elevated levels of lead, zinc, and other metals in the slag dump and nearby soil. The topography is mostly glacial terrace with some localized flood plain and the soils are predominantly sand overlying silt and clay (IDEQ 2006:4).

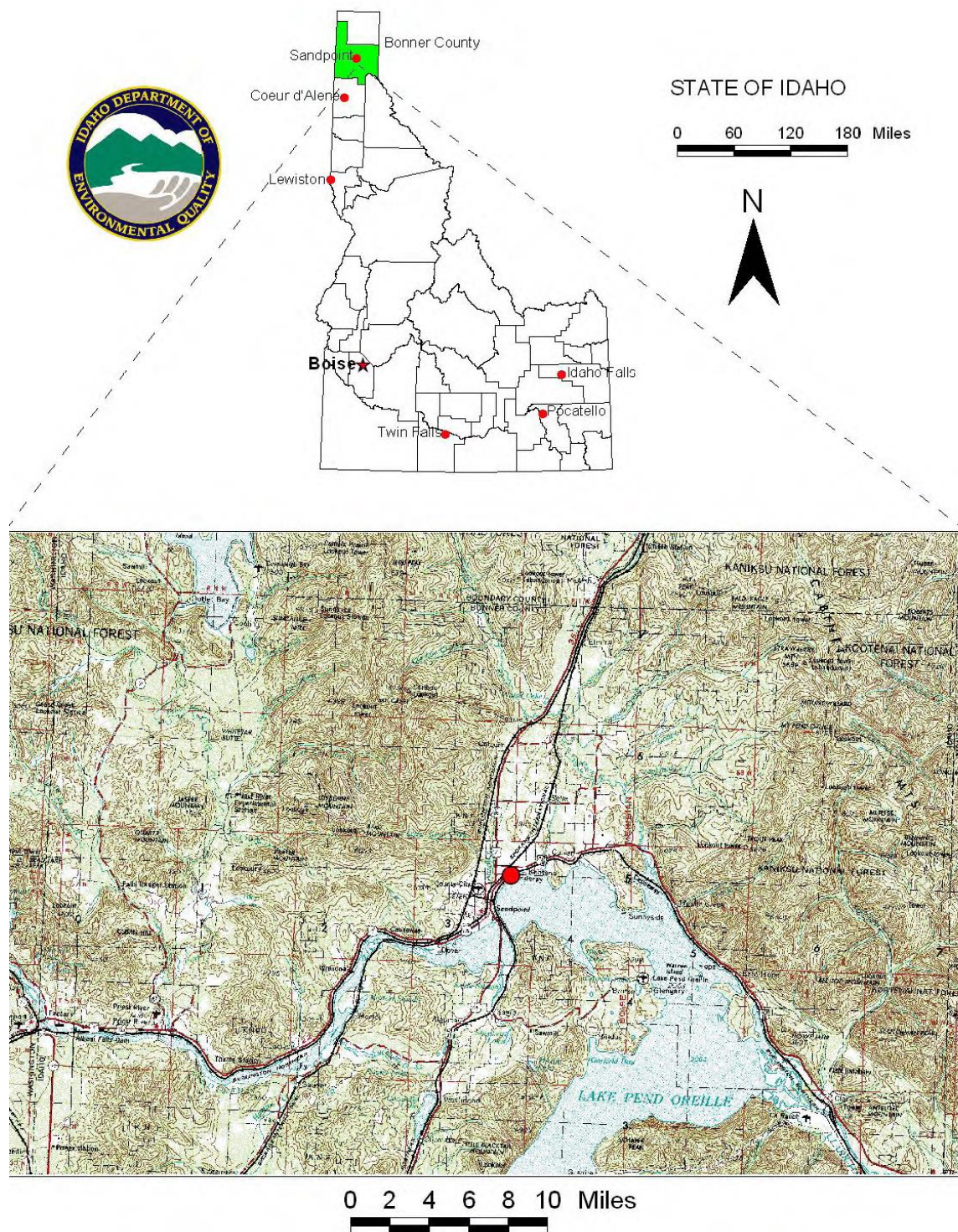


Figure 1. Map of the general project area. The location of the Panhandle Smelting and Refinery Company (PSRC) site (10BR539) is indicated by the red circle (adapted from IDEQ 2006: Figure 2-1).

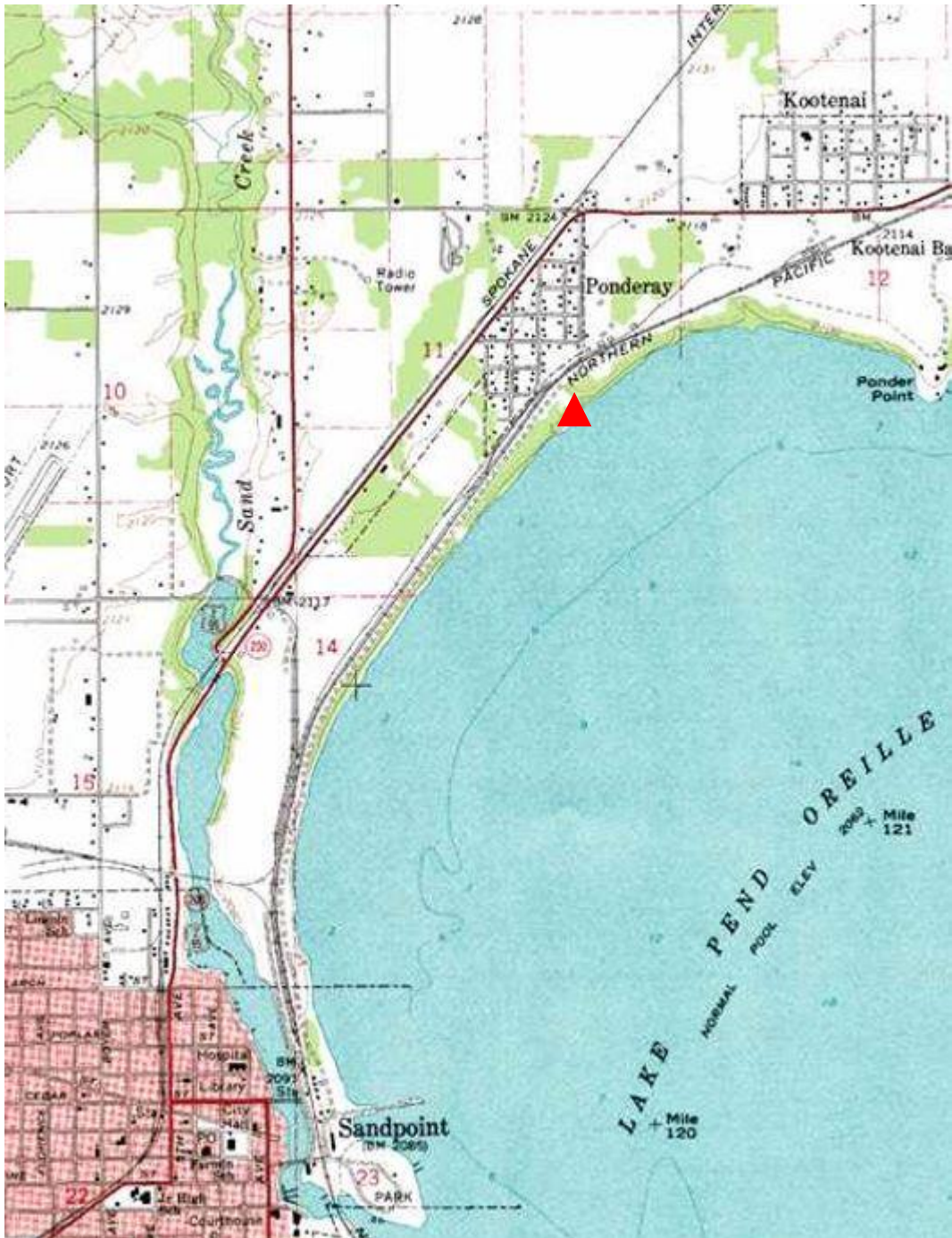


Figure 2. Location of the PSRC project area. The project area is the Area of Potential Effect (APE) and it is indicated by the red triangle. Adapted from the Sandpoint, ID quadrangle.



Figure 3. Aerial photograph of the portion of the PSRC site discussed in this report. The 13 soil sample units are labeled SS-1 to SS-13 (map labeled and provided by Tom Jenkins, Alta). Black Rock is just north of SS-1; note the dock on Lake Pend Oreille at the lower center.

The history of the PSRC site is one of contentious management, accusations, and lawsuits rather than a record of actual smelting. Planning for the smelter began in 1902 and the townsite of Panhandle (the name was changed to Ponderay by early 1905) began to grow up adjacent to the smelter at that time. Construction of the smelter began in 1904; the first lead bars were poured in 1907 and the smelter ran sporadically through March 1909. Following foreclosures and various sales, salvage crews had dismantled the plant by December 1922 (IDEQ 2006:4). Since that time, there has been little activity in the area with the exception of recent recreational use.

The project area is located well within the territory of the Kalispel Indians (Lahren 1998: Figure 1). Like other Plateau tribes, the Kalispel followed a seasonal round with subsistence based on a combination of wild foods including fish, game, and plant. Settlement centered on winter camps that were situated along the major drainages such as the Pend Oreille River while other seasonal camps were at locations where camas, berries, game, and other resources could be gathered and hunted. There are numerous precontact sites around Lake Pend Oreille but none appear to be in the vicinity of the APE.

Discussion

The author met with Alta and City personnel at the trail access parking lot in Sandpoint on 2 May 2023. We traveled together to the PSRC site where the author monitored the excavation of 13 soil test units. The locations of all units were determined by Alta Project Manager Derek Forseth and all excavation was conducted by Alta Environmental Scientist Tom Jenkins. All test units were situated along the lake shoreline adjacent to 10BR539 (Figure 3, Table 1). All excavation was conducted manually using a soil auger. The author recorded GPS points at each unit using a Garmin Etrex 32 instrument. The diameter of each unit was approximately 3 inches; the depth of each unit below the surface (BS) varied with conditions and results. Changes in soil composition, texture, and color were recorded by Mr. Jenkins and the following descriptions have been adapted from his field notes. Representative sediment samples were collected by Alta personnel for later analysis; no artifacts or samples were collected by the archaeological monitor.

Table 1. Summary of all soil test units at 10BR539, 2 May 2023.

Unit	mE	mN	Depth below surface (BS)
SS-1	534776	5349867	84 inches
SS-2	534791	5349871	30 inches
SS-3	534796	5349882	28 inches
SS-4	534801	5349900	72 inches
SS-5	534809	5349892	50 inches
SS-6	534804	5349876	126 inches
SS-7	534784	5349865	120 inches
SS-8	534785	5349159	102 inches
SS-9	534751	5349840	30 inches
SS-10	534739	5349826	12 inches
SS-11	534698	5349809	12 inches
SS-12	534810	5349909	32 inches
SS-13	534820	5349918	36 inches

SS-1

Three strata were described in SS-1. The upper 12 inches consisted of well-sorted light gray silty sand to fine sand. The next 12 inches was tan buff silty clay to fine sand. From 24 to 84 inches (2-7 feet) BS the sediment was light gray silty sand to very fine sand. No cultural resources were encountered.



Figure 4. Photograph of SS-1 taken at the beginning of excavation. Note Black Rock at the left and Lake Pend Oreille in the background. The view is to the east.



Figure 5. Photograph of sediment excavated in SS-1. The surface material is at the left.

SS-2

Only one stratum was described in SS-2 and it was from the surface to 30 inches BS. The sediment consisted of slag cobbles up to 4 inches in width with very few fines. No cultural resources were encountered.



Figure. 6 Photograph of SS-2 during excavation. Note Black Rock at the right and the dock in the left background. The view is to the west.



Figure 7. Photograph of sediment from SS-2. The upper material is at the left.

SS-3

Only one stratum was described in SS-3 and it was consistent from the surface to 28 inches BS. The sediment consisted of slag with some sands. No cultural resources were encountered.



Figure 8. Photograph of SS-3 during excavation. The view is to the west.



Figure 9. Photograph of sediment from SS-3. The upper material is at the left.

SS-4

Three strata were described in SS-4. Overall, the sediment was similar to SS-1. The uppermost 12 inches consisted of well-sorted light gray coarse sand. From 12 to 24 inches BS the moist sediment was tan buff silty clay to fine sand. From 24-36 inches BS the sediment was dark gray very fine silty sand; this stratum continued to 72 inches (6 feet) BS, changing only from moist to wet below 60 inches (5 feet) BS. No cultural resources were encountered.



Figure 10. Photograph of SS-4 during excavation. Note Black Rock in the center background and the dock in the left background. The view is to the west.



Figure 11. Photograph of sediment from SS-4. The upper stratum is at the left.

SS-5

Three strata were described in SS-5. The upper 12 inches consisted of gravel and cobble slag. From 12 to 30 inches BS the sediment was moist dark brown-red silty sand with some gravel. From 30 to 50 inches BS the sediment was gray clay; water was present at 42 inches BS. No cultural resources were encountered.



Figure 12. Photograph of SS-5 during excavation. Note Black Rock in the right background and the dock in the center background. The view is to the west.



Figure 13. Photograph of sediment from SS-5. The upper stratum is at the left.

SS-6

Three strata were described in SS-6. The upper 22 inches consisted of gravel slag and gray sands. The next stratum was brown silty to sandy clay. Gray clay was encountered at 30 inches BS and water was present at 40 inches BS; the clay continued to 126 inches BS. No cultural resources were encountered.



Figure 14. Photograph of SS-6 during excavation. The view is to the west.



Figure 15. Photograph of sediment from SS-6. The upper stratum is at the left.

SS-7

Two strata were described in SS-7. From the surface to 18 inches BS it was the same gravel slag and gray sand as in the upper stratum in SS-6. Gray clay was present from 18 to 120 inches BS. No cultural resources were encountered.



Figure 16. Photograph of SS-7 during excavation. The view is to the west.



Figure 17. Photograph of sediment from SS-7. The upper stratum is at the left.

SS-8

Three strata were described in SS-8. The upper 6 inches was black slag gravel. From 5 to 12 inches BS the sediment was gray sandy clay. From 12-102 inches (1 foot to 8.5 feet) BS the sediment was gray clay. No cultural resources were encountered.



Figure 18. Photograph of SS-8 during excavation. The view is to the west.

SS-9

Four strata were described in SS-9. The upper 6 inches was light gray sand and gravel. From 6 to 24 inches BS the sediment was gray clay. From 24 to 30 inches BS the unit was composed of organics (decomposed driftwood and roots); water was present at 30 inches BS. From 30 to 60 inches BS the sediment was dark gray silty sand to very fine sand. No cultural resources were encountered.



Figure 19. Photograph of sediment from SS-9. The upper stratum is at the left.

SS-10

Two strata were described in SS-10. Coarse dark brown sand was present from the surface to 10 inches BS and clay was present from 10-12 inches BS. Water was encountered at 2 inches BS and excavation ended at 12 inches BS. No cultural resources were encountered.



Figure 20. Photograph of SS-10 during excavation. The view is to the southwest.

SS-11

One stratum was described in SS-11 and it consisted of silty sand with very fine sand and some angular rock. Water was encountered at 3 inches BS and excavation ended at 12 inches BS. No cultural resources were encountered.



Figure 21. Photograph of SS-11 during excavation. The view is to the west.



Figure 22. Photograph of SS-11 with excavated sediment.

SS-12

Two strata were present in SS-12. The upper 3 inches was gravel and cobble slag. From 3 to 48 inches BS the sediment was very fine tan-buff silty sand. Water was encountered at 28 inches BS and the hole collapsed at 48 inches BS. No cultural resources were encountered.



Figure 23. Photograph of SS-12 during excavation. The view is to the west.

SS-13

Two strata were present in SS-13. The upper 6 inches consisted of slag gravel with black-red coarse gravel and sand. From 6 to 36 inches BS the sediment was very fine silty sand. Water was encountered at 6 inches BS and the hole collapsed at 36 inches BS. No cultural resources were encountered.



Figure 24. Photograph of SS-13 during excavation. The view is to the west.

Summary and Management Recommendations

Archaeological monitoring was conducted at the Panhandle Smelting and Refining Company site during subsurface soil testing along the shoreline of Lake Pend Oreille on 2 May 2023. A total of 13 test pits were excavated to as deep as 126 inches (10.5 feet) BS. The surface of the project area was surveyed during monitoring and occasional fragments of nondiagnostic glass and ceramic fragments, as well as aluminum and plastic containers, were observed. Most items were clearly modern and associated with recent recreational use of the shoreline. There was no evidence of lithic material, fire-modified rocks, or any indication of a pre-contact occupation on the shoreline. No recent, historic or precontact items were encountered in any of the test units.

Although no cultural resources were encountered during this project, the PSRC site was considered eligible for nomination to the National Register of Historic Places in 2001 under criteria A and D. It is therefore recommended that future ground-disturbing activities at the site continue to be monitored by a qualified archaeologist.

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- 2012b *Results of Archaeological Monitoring at the Panhandle Smelting and Refining Company Site (10BR539), for the Pend Oreille Bay Trail Project, Near Ponderay, Idaho in May 2012*. Report prepared for Terragraphics Environmental Engineering, Inc. and Idaho Department of Environmental Quality.