Spring 5-24-2022

Draft Final 2021 Unreclaimed Sites Sampling UR-01 Site Evaluation Summary Report

Pioneer Technical Services, Inc.

Atlantic Richfield Company

317 Anaconda Road
Butte MT 59701

Mike Mc Anulty
Liability Manager

Direct (406) 782-9964
Fax (406) 782-9980

May 24, 2022

Nikia Greene
Remedial Project Manager
US EPA – Montana Office
Baucus Federal Building
10 West 15th Street, Suite 3200
Helena, Montana 59626

Erin Agee
Senior Assistant Regional Counsel
US EPA Region 8 Office of Regional Counsel
CERCLA Enforcement Section
1595 Wynkoop Street
Denver, CO 80202
Mail Code: 8ORC-C

Daryl Reed
DEQ Project Officer
P.O. Box 200901
Helena, Montana 59620-0901

Jonathan Morgan, Esq.
DEQ, Legal Counsel
P.O. Box 200901
Helena, Montana 59620-0901

RE: BPSOU Unreclaimed Sites – Minnie Irvine (UR-01) Site Evaluation Summary Report

Agency Representatives:

I am writing to you on behalf of Atlantic Richfield Company to submit the Unreclaimed Site Minnie Irvine (UR-01) Evaluation Summary Report which summarizes sampling and site evaluation activities. The evaluation summary includes the data summary report (DSR) as Appendix A and the data validation report as an attachment (Attachment A) to the DSR. The report and appendices may be downloaded at the following link:

https://pioneertechnicalservices.sharepoint.com/:f:/s/submitted/EtWZuE9o6R1EhBgqS7MNvnoB2pKr65giJoVzs5UBioBBAQ.

If you have any questions or comments, please call me at (907) 355-3914.

Sincerely,

Mike McAnulty

Mike Mc Anulty
Liability Manager & Global Risk Champion
Remediation Management Services Company
An affiliate of **Atlantic Richfield Company**

Atlantic Richfield Company

317 Anaconda Road
Butte MT 59701
Direct (406) 782-9964
Fax (406) 782-9980

Cc: Patricia Gallery / Atlantic Richfield - email
Chris Greco / Atlantic Richfield – email
Josh Bryson / Atlantic Richfield - email
Mike Mc Anulty / Atlantic Richfield - email
Loren Burmeister / Atlantic Richfield – email
Dave Griffis / Atlantic Richfield - email
Jean Martin / Atlantic Richfield - email
Irene Montero / Atlantic Richfield - email
David A. Gratson / Environmental Standards / email
Mave Gasaway / DGS - email
Brianne McClafferty / Holland & Hart - email
Joe Vranka / EPA - email
David Shanight / CDM - email
Curt Coover / CDM - email
James Freeman / DOJ - email
John Sither / DOJ - email
Dave Bowers / DEQ - email
Carolina Balliew / DEQ - email
Matthew Dorrington / DEQ - email
Jim Ford / NRDP - email
Pat Cunneen / NRDP - email
Harley Harris / NRDP - email
Katherine Hausrath / NRDP - email
Meranda Flugge / NRDP - email
Ted Duaime / MBMG - email
Gary Icopini / MBMG - email
Becky Summerville / MR - email
Kristen Stevens / UP - email
Robert Bylsma / UP - email
John Gilmour / Kelley Drye - email
Leo Berry / BNSF - email
Robert Lowry / BNSF - email
Brooke Kuhl / BNSF – email
Mark Engdahl / BNSF - email
Jeremie Maehr / Kennedy Jenks - email
Annika Silverman / Kennedy Jenks - email
Matthew Mavrinac / RARUS - email
Harrison Roughton / RARUS - email
Brad Gordon / RARUS - email
Mark Neary / BSB - email
Eric Hassler / BSB - email
Julia Crain / BSB - email
Chad Anderson / BSB - email

Atlantic Richfield Company

317 Anaconda Road
Butte MT 59701
Direct (406) 782-9964
Fax (406) 782-9980

Brandon Warner / BSB – email
Abigail Peltomaa / BSB - email
Eileen Joyce / BSB – email
Sean Peterson/BSB – email
Gordon Hart / BSB – email
Jeremy Grotbo / BSB – email
Karen Maloughney / BSB – email
Josh Vincent / WET - email
Craig Deeney / TREC - email
Scott Bradshaw / TREC - email
Brad Archibald / Pioneer - email
Pat Sampson / Pioneer - email
Joe McElroy / Pioneer – email
Andy Dare / Pioneer – email
Karen Helfrich / Pioneer - email
Leesla Jonart / Pioneer - email
Randa Colling / Pioneer – email
Ian Magruder/ CTEC- email
CTEC of Butte – email
Scott Juskiewicz / Montana Tech – email

File: MiningSharePoint@bp.com - email
BPSOU SharePoint - upload

SILVER BOW CREEK/BUTTE AREA NPL SITE
BUTTE PRIORITY SOILS OPERABLE UNIT

Draft Final

2021 Unreclaimed Sites Sampling UR-01
Site Evaluation Summary Report

Atlantic Richfield Company

2022

SILVER BOW CREEK/BUTTE AREA NPL SITE
BUTTE PRIORITY SOILS OPERABLE UNIT

Draft Final

2021 Unreclaimed Sites Sampling UR-01
Site Evaluation Summary Report

Prepared for:

Atlantic Richfield Company
317 Anaconda Road
Butte, Montana 59701

Prepared by:

Pioneer Technical Services, Inc.
1101 South Montana Street
Butte, Montana 59701

2022

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ABBREVIATIONS AND ACRONYMS

Acronym	Definition	Acronym	Definition
BPSOU	Butte Priority Soils Operable Unit	**QAPP**	Quality Assurance Project Plan
CB	Catch Basin	**QC**	Quality Control
CD	Consent Decree	**SBC**	Silver Bow Creek
DSR	Data Summary Report	**SD**	Settling Defendants
FRESOW	Further Remedial Elements Scope of Work	**UR**	Unreclaimed
mg/kg	milligram per kilogram	**XRF**	X-ray Fluorescence
QA	Quality Assurance		

1.0 INTRODUCTION

This Butte Priority Soils Operable Unit (BPSOU) Unreclaimed (UR) Site Evaluation Summary presents the declarations of the subsurface soil sampling conducted from November 2, 2021, through November 03, 2021, at the UR source area UR-01 within the BPSOU (referred to herein as UR-01 Site or Site).

Unreclaimed solid media sites located within the BPSOU may have potentially been impacted by historical mining. These sites must be evaluated to determine if remedial action is required. Site evaluations are completed to determine if a specific site poses a threat to human health, contributes metals-impacted sediments to existing or planned wet weather control features, or contributes to the degradation of surface water quality as described in the BPSOU Consent Decree (CD), Appendix D, Attachment C Further Remedial Elements Scope of Work (FRESOW) (EPA, 2020).

Source areas within the BPSOU may include upland soil waste, mine waste, and floodplain soil and waste. These source areas have the potential to act as indirect pathways for human exposure, contribute metal inputs to the alluvial and bedrock aquifers, and act as metals sources to surface water (to Blacktail Creek and Silver Bow Creek [SBC]) via storm water runoff.

Means and methods used to characterize UR Sites and make remediation recommendations are described in the 2021 UR Sites Quality Assurance Project Plan (QAPP) (Atlantic Richfield Company, 2021) (referred to herein as the QAPP). Results from site sampling/inspection activities will be used to make site declarations and drive remedial action requirements to be completed by the Settling Defendants (SDs). Contaminated solid media identified within the BPSOU will be addressed through a combination of source removal, capping, and/or land reclamation as appropriate to meet the Butte Hill Revegetation Specifications (EPA, 2020). The specific Remedial Action Work Plans will be prepared by the SDs and approved by Agencies prior to implementation.

1.1 Objectives

This Site Evaluation Summary Report presents all Site data and declarations, as required in the FRESOW (EPA, 2020), from the UR-01 Site investigation. Results from the 2021 investigation are summarized in the Data Summary Report (DSR) in Appendix A, which includes a Data Validation Report. The conclusions and declarations provided in this report were based on the objectives and procedures executed and outlined in the DSR. General Site and sample station photographs are included in Appendix B.

This Evaluation Summary Report includes information within each related report as described below:

Site Evaluation Summary:

- A summary of all Site data (historical and new).
- A declaration as to whether the Site contains concentrations at or above human health action levels or the Waste Identification Criteria in Table 1 in Appendix 1 of the BPSOU CD (EPA, 2020).
- A declaration as to whether historical mine waste at the Site is contributing to the degradation of surface water quality.
- A declaration as to whether the Site contributes metals-impacted sediment to existing or planned wet weather control features.

DSR (Appendix A):

- Investigation objectives.
- Data quality assessment.
- Project objectives and sampling design review.
- Preliminary data review.
- Conclusions on the quality of the data.
- Sampling and analysis summary.

Data Validation Report (Attachment A of the DSR):

- Quality assurance (QA) and quality control (QC) review of inorganic data.
- Level A/B Assessment.
- Assessment of precision, accuracy, representativeness, comparability, completeness, and sensitivity between X-ray fluorescence (XRF) and laboratory data.
- Overall data summary.

The following sections provide details about the items bulleted above.

The land use at the UR-01 Site is residential per professional judgment by the field team lead, informed by current county zoning and guidance listed in the 2006 Record of Decision requirements (Appendix A of the BPSOU CD; EPA, 2020). Human health action levels and storm water criteria for residential space were referenced to prepare this declaration. The action levels are listed in Table 1.

2.0 SITE DESCRIPTION AND BACKGROUND

Site UR-01 is approximately 5.44 acres and is located north of Walkerville, Montana, and just north of the Alice Pit. The Site is bounded on the south by North Alice Street and on the north by Ryan Road (Figure 1). Ownership of the Site includes Atlantic Richfield Company and a private third party. Site UR-01 is vacant land with well-established vegetation and several bare areas, including windrows of dumped material. The dumped material is covered with established weeds and grasses. An erosion rill, starting from the middle of the Site running northwest into the drainage ditch, appears to have iron staining present. There are residences within 200 feet of UR-01 in several directions. Site UR-01 is in the Beef Straight Gulch drainage basin.

3.0 SITE EVALUATION

The Site was evaluated following the Unreclaimed Area Logic Diagram (Appendix A.3 of the QAPP) to determine if reclamation is warranted. The 2021 Site investigation was completed on November 03, 2021. Sampling activities were performed according to specified standard operating procedures (SOPs) as outlined in the QAPP. The DSR in Appendix A includes a description of the 2021 investigation. Composite samples were collected from each location at the specified depth intervals of 0 to 2 inches, 2 to 6 inches, and 6 to 12 inches. One historical data set was available from 1987 (CDM, 1988). Photographs of the sampling events are in Appendix B.

3.1 Data Summary

A total of 81 natural soil samples were collected and analyzed by XRF for arsenic, cadmium, copper, lead, zinc, and mercury. Out of the 81 collected soil samples, 52 were submitted to Pace Analytic Services, LLC for laboratory confirmation (per Section 3.2.4, Table 5 of the QAPP) and 3 samples were submitted for laboratory QA and QC. The DSR in Appendix A details the total XRF samples collected, confirmation laboratory samples submitted, and the QA and QC laboratory samples submitted. One historical sample location was collected in 1987 (CDM, 1988) for XRF analysis of arsenic, cadmium, copper, lead, and zinc. Based on the data quality conclusions in the DSR, the data analyzed in 2021 were deemed usable.

For samples analyzed by both XRF and laboratory, the laboratory results were used for the evaluation of the Site. For samples analyzed only by XRF, the XRF results were used for the evaluation of the Site.

3.2 Human Health Action Levels

Table 2 lists the historical data, Table 3 lists the new data, and Table 4 describes the exceedances related to the following findings of the 2021 investigation:

- Two lead results from sample station UR-01-SS-23 exceeded the human health action level (1,200 milligrams per kilogram [mg/kg]) reporting values of 1,340 mg/kg and 2,850 mg/kg.

3.3 Screening Criteria for Storm Water

Table 2 lists the historical data, Table 3 lists the new data, and Table 4 describes the exceedances related to the following findings of the 2021 investigation:

- Sample BPSOU-UR01SS23-110221-2 exceeded the cadmium, lead, and zinc screening criteria for storm water. The zinc result for this sample also exceeded the 5,000 mg/kg storm water threshold for any 1 contaminant.

One sample collected in 2021 exceeded 3 of the 6 contaminant screening level criteria listed in Table 1. The same sample exceeded 5,000 mg/kg for zinc; therefore, it is recommended the Site be further analyzed to determine the materiality of the load and the possible contribution to the degradation of surface water per the requirements of the QAPP (Section 2.4, Step 5, page 8).

3.4 Sedimentation Analysis

Contribution to degradation of surface water quality or metals-impacted sediment is determined by evaluating the presence of rills, concentrated outflow, and metals-impacted sediment in downstream infrastructure; determining sediment contribution upgradient of the Site; and identifying pathways to surface water features (Figure 2).

Presence of Rills:
Rills have been documented at the UR-01 Site. Established grasses and weeds exist throughout the entire Site. Slopes on the Site are eroding along barren areas and open dump piles. Also, potential for rilling was observed at the west end of the Site as the Site's general topography slopes from east to west. Storm water and erosion on the southern boundary of the Site has affected Alice Street (directly south of the Site) in that storm water and sediment from the Site travel on and along the street.

Concentrated Outflow:
There is no existing Superfund storm water infrastructure within the UR-01 Site. However, a drainage ditch exists along the southern border of the Site paralleling Alice Street. Storm water and sediment on the southeastern third of the Site is collected by this ditch and appears to flow west to a natural depression just north of the western end of the Site. Sediment deposits along Alice Street indicate active sediment transportation from the south slope of the Site.

Evaluate Metals-Impacted Sediment in Downstream Infrastructure:
One of 27 locations sampled exceeded human health and storm water criteria. Sediment from this localized area appears to flow west along Alice Street and then north to the natural depression northwest of the Site.

Evaluate Contributing Sediment Loading Above the Site:
There does not appear to be any sediment loading contributed by sites upslope of the UR-01 Site. North of the Site (just south of Ryan Road), sediment and storm water are collected by the natural depression, where settling occurs.

Direct Linkage to Surface Water Features:
A potentially complete pathway to surface water exists from Alice Street to Beef Straight Gulch, then Oro Fino Gulch to Browns Gulch, eventually leading to SBC just west of Ramsay, Montana. However, visual observations suggest that most sediment and storm water leaving UR-01 are funneled to the naturally occurring depression just northwest of the Site where infiltration occurs and sediment is contained. If a large enough storm or snow melt event caused overtop of the natural basin, with the length of travel in a well-vegetated drainage leading to SBC, it is implausible that sediment from UR-01 would contribute metals loading to SBC.

4.0 DECLARATION CONCLUSION

One of 27 locations sampled during the 2021 investigation exceeded human health and storm water criteria, along the southeast edge of the UR-01 boundary. From this single location (SS-23), both subsurface samples (2- to 6-inch and 6- to 12-inch intervals), exceeded the human health action level for lead and 1 subsurface sample, collected from the 2-to 6-inch interval, exceeded 3 of the 6 contaminant screening level criteria listed in Table 1, and zinc exceeded the 5,000 mg/kg waste criteria. The surface sample (0-to 2-inch interval) collected at SS-23 did not exceed human health or storm water criteria. The sedimentation analysis (Section 3.4) indicates the following:

- Documentation of rills and minor soil loss from the Site along Alice Street.
- Evidence of localized metals-impacted sediment within the UR Site boundary.
- A natural depression west of the Site captures storm water runoff and retains sediment.

The Site exhibits a potentially complete pathway to SBC through Browns Gulch. However, with most sediment naturally contained and the length of travel in a well-vegetated drainage leading to SBC, it is implausible that sediment from UR-01 would contribute metals loading to SBC. Based on the criteria identified in the QAPP and established qualifying data, further actions may be warranted to address the effect of localized metals-impacted sediment and human health exceedances along the southeastern portion of the Site. Most of the 5.44-acre Site does not appear to contribute to degradation of human health or the environment as sample results were less than action levels.

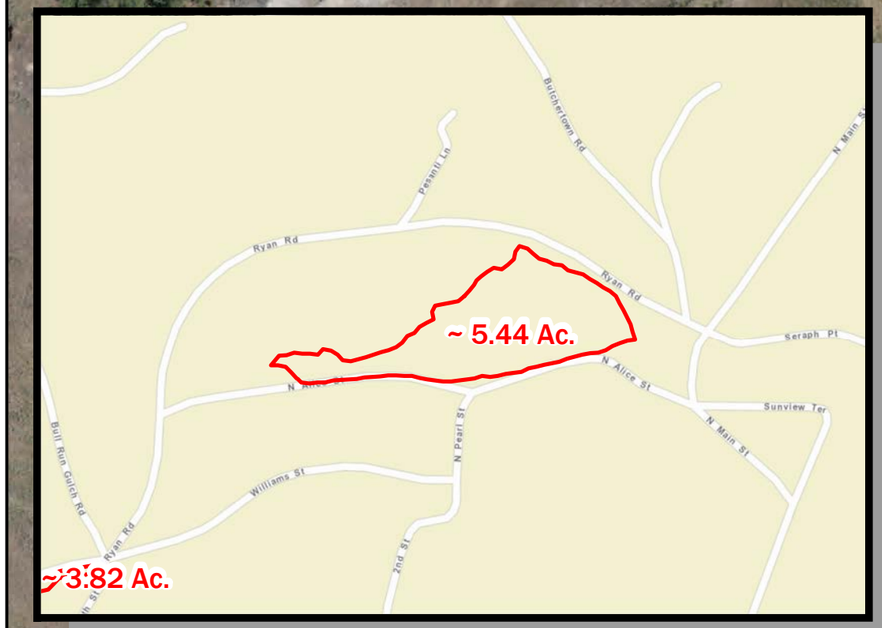
5.0 REFERENCES

Atlantic Richfield Company, 2021. Unreclaimed Sites Quality Assurance Project Plan. Atlantic Richfield Company, June 2021.

CDM, 1988. Butte Soils Screening Study Final Report. April 1988

EPA, 2020. Consent Decree for the Butte Priority Soils Operable Unit. Partial Remedial Design/Remedial Action and Operation and Maintenance. U.S. Environmental Protection Agency. February 13, 2020. Available at https://www.co.silverbow.mt.us/2161/ButtePriority-Soils-Operable-Unit-Conse. Appendix A of the Consent Decree contains the 2006 Record of Decision.

Figures



HUMAN HEALTH EXCEEDANCE
STORM WATER EXCEEDANCE
NO EXCEEDANCE
WASTE EXCEEDANCE
HISTORIC SAMPLE STATION
UNRECLAIMED SITE BOUNDARY

N

DISPLAYED AS:
PROJECTION/ZONE: MSP
DATUM: NAD 83
UNITS: INT'L FT
SOURCE: PIONEER/BSB/AR/QSI 2020

0 62.5 125 250
Feet

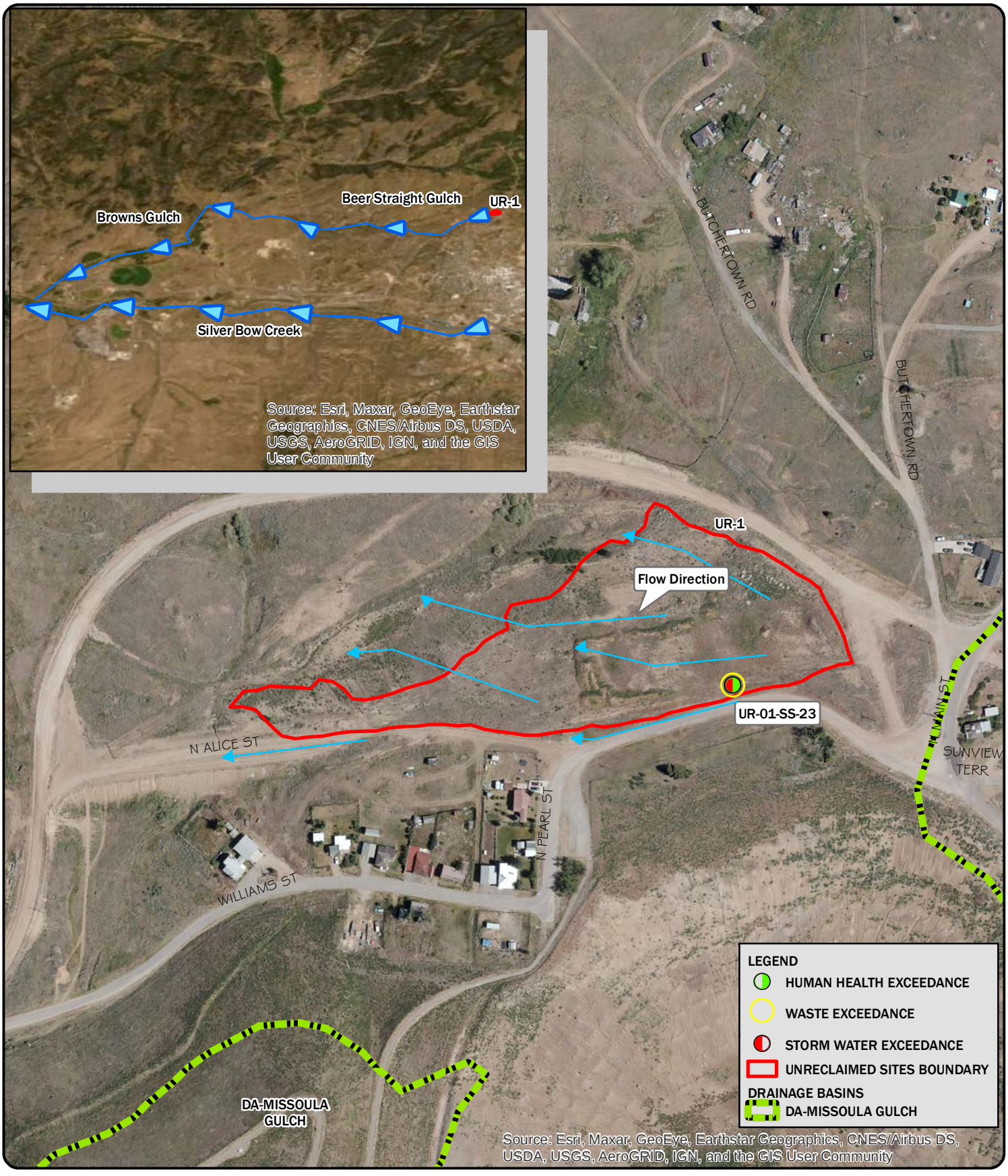
FIGURE 1

PIONEER TECHNICAL SERVICES, INC.

DATE: 3/25/2022

UR-01
2021 UR SITES
SAMPLING AND
EXCEEDANCES

Path: Z:\Shared\Active Projects\ARCO\BPSOU\LandSupport\SolidMedia\Insufficiently_Unreclaimed\SamplingResults\UR_Sampling\UR_Res_UR01_22.mxd



N

DISPLAYED AS:
PROJECTION/ZONE: MSP
DATUM: NAD 83
UNITS: INT'L FT
SOURCE: PIONEER/BSB/QSI 2020

0 125 250 500
Feet

FIGURE 2

PIONEER TECHNICAL SERVICES, INC.

Unreclaimed Sites
UR-01
Storm Water Features

DATE: 4/29/2022

Path: Z:\Shared\Active Projects\ARCO\BPSOU\LandSupport\SolidMedia\Insufficiently_Unreclaimed\UR_Sampling\DRAINAGE\UR01_SW.mxd

Tables

Table 1. BPSOU Soil Screening Criteria

Analyte	Solid Media	Action/Screening Levels
Lead[1]	Residential	1,200 mg/kg
Arsenic[1]	Residential	250 mg/kg
Mercury[1]	Residential	147 mg/kg
Cadmium [2]		20 mg/kg
Copper [2]		1,000 mg/kg
Zinc [2]		1,000 mg/kg
Lead [2]		1,000 mg/kg
Arsenic [2]		200 mg/kg
Mercury [2]		10 mg/kg

1. From EPA Record of Decision (ROD) BPSOU, Table 12-1 (EPA, 2006a).

2. Waste Identification Criteria in Table 1 in Appendix 1 of the BPSOU Consent Decree (EPA, 2020).

mg/kg: milligrams per kilogram

Table 2: Historic Data Summary

COC	Sample WD-029
Arsenic	25 J
Cadmium	5.00
Copper	103.00
Lead	33.00
Zinc	152.00

Storm Water Screening Criteria Exceedance

Human Health Action Level Exceedance

Table 3: New Data Summary

Station	FieldSampleID	Result Type	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Zinc (mg/kg)	1+ >HH std	3+ >SW std	1+ >5000	Exceed SW	Exceed
UR-01-OP-01	BPSOU-UR01OP01-110221-1	XRF	10.69	6.95 U	46.72	12.97	5.87 UJ	74.51					
UR-01-OP-01	BPSOU-UR01OP01-110221-2	XRF	14.27	6.99 U	26.06	11.88	6.18 UJ	73.98					
UR-01-OP-01	BPSOU-UR01OP01-110221-3	XRF	12.69	7.07 U	43.00	19.53	6.12 UJ	77.10					
UR-01-SS-01	BPSOU-UR01SS01-110321-1	XRF	7.40 U	7.40 U	70.86	48.95	6.38 UJ	130.86					
UR-01-SS-01	BPSOU-UR01SS01-110321-2	Lab	4.70	0.19	40.10	22.70	0.008 U	70.30					
UR-01-SS-01	BPSOU-UR01SS01-110321-3	Lab	3.40	0.16	42.10	24.70	0.010 A	75.50					
UR-01-SS-02	BPSOU-UR01SS02-110321-1	XRF	8.09	7.44 U	79.07	14.14	6.47 UJ	102.78					
UR-01-SS-02	BPSOU-UR01SS02-110321-2	Lab	2.40	0.11 A	41.50	6.10 J	0.010 A	46.10					
UR-01-SS-02	BPSOU-UR01SS02-110321-3	XRF	5.50 U	7.62 U	67.44	17.77	6.45 UJ	123.52					
UR-01-SS-03	BPSOU-UR01SS03-110321-1	Lab	3.70	0.23	68.60	13.80	0.010 UJ	71.70 J-					
UR-01-SS-03	BPSOU-UR01SS03-110321-2	Lab	9.20	0.24	63.10	10.70	0.009 UJ	92.00					
UR-01-SS-03	BPSOU-UR01SS03-110321-3	Lab	2.30	0.18	39.50	8.30	0.009 UJ	65.70					
UR-01-SS-04	BPSOU-UR01SS04-110321-1	Lab	2.80	0.18	49.70	16.90	0.009 UJ	73.60					
UR-01-SS-04	BPSOU-UR01SS04-110321-2	Lab	3.00	0.13 A	61.40	13.50	0.008 UJ	59.00					
UR-01-SS-04	BPSOU-UR01SS04-110321-3	Lab	1.70	0.065 A	35.90	3.90	0.009 UJ	42.80					
UR-01-SS-05	BPSOU-UR01SS05-110321-1	Lab	5.20	0.56	41.80	56.20	0.24 J-	158.00					
UR-01-SS-05	BPSOU-UR01SS05-110321-2	Lab	4.30	0.40	42.10	58.70	0.35 J-	152.00					
UR-01-SS-05	BPSOU-UR01SS05-110321-3	Lab	4.40	0.52	37.80	40.60	0.84 J-	141.00					
UR-01-SS-06	BPSOU-UR01SS06-110321-1	Lab	3.20	0.14 A	40.00	22.40	0.016 J-	53.50					
UR-01-SS-06	BPSOU-UR01SS06-110321-2	Lab	3.40	0.18	38.20	9.10	0.022 J-	49.90					
UR-01-SS-06	BPSOU-UR01SS06-110321-3	XRF	5.84	7.74 U	66.72	21.19	6.45 UJ	112.25					
UR-01-SS-07	BPSOU-UR01SS07-110321-1	Lab	2.00	0.17	31.20	9.20	0.013 J-	55.50					
UR-01-SS-07	BPSOU-UR01SS07-110321-2	Lab	1.50	0.18	29.50	5.80	0.008 UJ	46.60					
UR-01-SS-07	BPSOU-UR01SS07-110321-3	Lab	2.30	0.09	25.90	4.30	0.008 UJ	38.60					
UR-01-SS-08	BPSOU-UR01SS08-110221-1	Lab	3.50	0.12 A	41.70	18.90	0.02	58.90					
UR-01-SS-08	BPSOU-UR01SS08-110221-2	Lab	4.20	0.14 A	32.60	11.70	0.03	51.60					
UR-01-SS-08	BPSOU-UR01SS08-110221-3	Lab	4.10	0.40	40.10	12.10	0.012 A	73.90					
UR-01-SS-09	BPSOU-UR01SS09-110221-1	XRF	24.89	6.42 U	52.70	21.03	5.87 UJ	100.42					
UR-01-SS-09	BPSOU-UR01SS09-110221-2	XRF	29.83	6.78 U	48.40	18.79	6.01 UJ	98.24					
UR-01-SS-09	BPSOU-UR01SS09-110221-3	XRF	29.36	6.69 U	55.84	18.03	5.91 UJ	102.58					
UR-01-SS-10	BPSOU-UR01SS10-110221-1	XRF	14.41	7.13 U	86.66	25.39	6.34 UJ	129.66					
UR-01-SS-10	BPSOU-UR01SS10-110221-2	Lab	4.90	0.33	47.40	15.00	0.23	78.50					
UR-01-SS-10	BPSOU-UR01SS10-110221-3	Lab	4.30	0.43	64.80	17.70	0.55	110.00					
UR-01-SS-11	BPSOU-UR01SS11-110221-1	XRF	8.99	7.85	60.55	25.68	6.46 UJ	156.74					
UR-01-SS-11	BPSOU-UR01SS11-110221-2	Lab	4.70	0.26	44.60	26.70	0.02	83.10					
UR-01-SS-11	BPSOU-UR01SS11-110221-3	Lab	7.30	0.58	61.80	88.70	0.10	167.00					
UR-01-SS-12	BPSOU-UR01SS12-110221-1	XRF	10.39	7.65 U	63.55	58.44	6.44 UJ	157.57					
UR-01-SS-12	BPSOU-UR01SS12-110221-2	Lab	18.00	0.30	35.00	20.60	0.014 A	144.00					
UR-01-SS-12	BPSOU-UR01SS12-110221-3	XRF	6.06	8.09	74.75	18.19	6.25 UJ	193.16					
UR-01-SS-13	BPSOU-UR01SS13-110221-1	Lab	9.40	0.30	59.20	25.50	0.032 J-	113.00					
UR-01-SS-13	BPSOU-UR01SS13-110221-2	Lab	4.90	0.14 A	48.80	12.10	0.010 A	78.30					
UR-01-SS-13	BPSOU-UR01SS13-110221-3	Lab	2.70	0.24	45.90	7.80	0.012 A	79.30					
UR-01-SS-15	BPSOU-UR01SS15-110221-1	Lab	8.10	0.53	73.20	75.50	0.61	168.00					
UR-01-SS-15	BPSOU-UR01SS15-110221-2	Lab	12.20	1.70	71.40	200.00	0.23	315.00					
UR-01-SS-15	BPSOU-UR01SS15-110221-3	Lab	8.10	0.90	82.00	195.00	0.15	243.00					
UR-01-SS-16	BPSOU-UR01SS16-110221-1	XRF	30.77	6.79 U	52.56	25.88	5.90 UJ	107.03					
UR-01-SS-16	BPSOU-UR01SS16-110221-2	Lab	11.80	0.55	46.70	43.50	0.11	134.00					
UR-01-SS-16	BPSOU-UR01SS16-110221-3	Lab	6.00	0.46	58.90	55.40	0.21	138.00					
UR-01-SS-17	BPSOU-UR01SS17-110221-1	XRF	30.07	7.00 U	48.64	23.32	6.10 UJ	103.74					
UR-01-SS-17	BPSOU-UR01SS17-110221-2	XRF	32.63	6.83 U	56.75	23.21	6.14 UJ	97.97					
UR-01-SS-17	BPSOU-UR01SS17-110221-3	XRF	29.55	6.94 U	44.34	24.04	6.27 UJ	94.33					
UR-01-SS-18	BPSOU-UR01SS18-110221-1	Lab	7.20	0.66	54.70	80.70	0.12	200.00					
UR-01-SS-18	BPSOU-UR01SS18-110221-2	Lab	5.10	0.21	39.40	26.50	0.11	79.40					
UR-01-SS-18	BPSOU-UR01SS18-110221-3	Lab	5.00	0.24	39.40	23.80	0.08	76.30					
UR-01-SS-19	BPSOU-UR01SS19-110221-1	Lab	5.00	0.33	49.90	39.40 J-	0.051 J	114.00 J-					
UR-01-SS-19	BPSOU-UR01SS19-110221-2	Lab	5.00	0.30	50.20	39.10	0.06	97.20					
UR-01-SS-19	BPSOU-UR01SS19-110221-3	Lab	4.00	0.24	39.90	37.20	0.07	102.00					
UR-01-SS-20	BPSOU-UR01SS20-110221-1	XRF	42.60	6.68 U	67.66	31.26	5.83 UJ	94.57					
UR-01-SS-20	BPSOU-UR01SS20-110221-2	XRF	38.13	6.98 U	52.84	18.88	6.40 UJ	93.26					

UR-01-SS-20	BPSOU-UR01SS20-110221-3	XRF	32.92	7.03 U	45.76	16.03	5.88 UJ	91.03					
UR-01-SS-21	BPSOU-UR01SS21-110221-1	Lab	195.00	0.82	398.00	119.00	0.25	271.00					
UR-01-SS-21	BPSOU-UR01SS21-110221-2	Lab	158.00	0.25	224.00	35.60	0.27	96.30					
UR-01-SS-21	BPSOU-UR01SS21-110221-3	Lab	167.00	0.14 A	241.00	18.20	0.06	60.00					
UR-01-SS-22	BPSOU-UR01SS22-110221-1	XRF	33.83	6.87 U	67.40	28.82	5.86 UJ	79.20					
UR-01-SS-22	BPSOU-UR01SS22-110221-2	Lab	22.20	0.49	30.40	12.70	0.03	42.00					
UR-01-SS-22	BPSOU-UR01SS22-110221-3	XRF	31.56	7.04 U	59.88	24.60	6.14 UJ	92.40					
UR-01-SS-23	BPSOU-UR01SS23-110221-1	Lab	31.30	9.40	180.00	656.00	0.61	2,010.00					
UR-01-SS-23	BPSOU-UR01SS23-110221-2	Lab	60.10	79.20	569.00	2,850.00	2.40	22,800.00	**TRUE**	**TRUE**	**TRUE**	**TRUE**	**TRUE**
UR-01-SS-23	BPSOU-UR01SS23-110221-3	Lab	51.70	6.00	285.00	1,340.00	1.20	1,310.00	**TRUE**				**TRUE**
UR-01-SS-24	BPSOU-UR01SS24-110221-1	Lab	6.40	0.50	49.50	47.30	0.07	147.00					
UR-01-SS-24	BPSOU-UR01SS24-110221-2	XRF	12.85	7.28 U	63.94	40.46	6.49 UJ	171.49					
UR-01-SS-24	BPSOU-UR01SS24-110221-3	XRF	10.03	7.58 U	52.19	21.07	6.50 UJ	115.90					
UR-01-SS-25	BPSOU-UR01SS25-110221-1	Lab	7.10 J	0.49	55.40	54.20	0.05	155.00					
UR-01-SS-25	BPSOU-UR01SS25-110221-2	Lab	6.90	0.44	55.50	58.90	0.04	149.00					
UR-01-SS-25	BPSOU-UR01SS25-110221-3	XRF	7.30	5.60 U	51.22	31.23	5.34 UJ	136.54					
UR-01-SS-26	BPSOU-UR01SS26-110221-1	XRF	27.87	7.16 U	77.70	53.98	6.17 UJ	204.11					
UR-01-SS-26	BPSOU-UR01SS26-110221-2	Lab	14.80	2.80	77.70	148.00	0.09	334.00					
UR-01-SS-26	BPSOU-UR01SS26-110221-3	Lab	15.50	1.90	92.50	288.00	0.21	405.00					
UR-01-SS-27	BPSOU-UR01SS27-110221-1	XRF	14.91	9.18	63.67	31.96	6.38 UJ	132.88					
UR-01-SS-27	BPSOU-UR01SS27-110221-2	XRF	28.25	8.22	77.56	60.63	6.49 UJ	260.11					
UR-01-SS-27	BPSOU-UR01SS27-110221-3	Lab	6.10	0.35	64.50	25.30 J-	0.034 J-	98.60 S-					

Storm Water Screening Criteria Exceedance

Human Health Action Level Exceedance

Table 4: Exceedances									
Station	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Zinc (mg/kg)	1+ >HH std	3+ >SW std	1+ >5000
UR-01-SS-23	60.10	79.20	569.00	2,850.00	2.40	22,800.00	TRUE	TRUE	TRUE
UR-01-SS-23	51.70	6.00	285.00	1,340.00	1.20	1,310.00	TRUE		

Storm Water Screening Criteria Exceedance

Human Health Action Level Exceedance

Appendix A
Data Summary Report
(includes Data Validation Report)

SILVER BOW CREEK/BUTTE AREA NPL SITE
BUTTE PRIORITY SOILS OPERABLE UNIT

Draft Final

2021 Unreclaimed Sites Sampling
UR-01 Data Summary Report (DSR)

Atlantic Richfield Company

May 2022

SILVER BOW CREEK/BUTTE AREA NPL SITE
BUTTE PRIORITY SOILS OPERABLE UNIT

Draft Final

2021 Unreclaimed Sites Sampling
UR-01 Data Summary Report (DSR)

Prepared for:

Atlantic Richfield Company
317 Anaconda Road
Butte, Montana 59701

Prepared by:

Pioneer Technical Services, Inc.
1101 South Montana Street
Butte, Montana 59701

May 2022

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ABBREVIATIONS AND ACRONYMS

ACRONYM	DEFINITION	ACRONYM	DEFINITION
Atlantic Richfield	Atlantic Richfield Company	**FSP**	Field Sampling Plan
BPSOU	Butte Priority Soils Operable Unit	**Pace**	Pace Analytical Services
CD	Consent Decree	**Pioneer**	Pioneer Technical Services, Inc.
CFRSSI	Clark Fork River Superfund Site Investigation	**QA**	Quality Assurance
DI	Deionized	**QAPP**	Quality Assurance Project Plan
DM/DV	Data Management/Data Validation	**QC**	Quality Control
DQA	Data Quality Assessment	**SOP**	Standard Operation Procedures
DSR	Data Summary Report	**UR**	Unreclaimed
DVR	Data Validation Report	**XRF**	X-ray Fluorescence
EPA	Environmental Protection Agency		

ABSTRACT

This Butte Priority Soils Operable Unit (BPSOU) Unreclaimed (UR) Sites Data Summary Report (DSR) presents results of the subsurface soil sampling conducted from November 2, 2021, through November 03, 2021, at the UR source area UR-01 within the BPSOU.

For the event, 27 sample stations were sampled by collecting 3-point composite samples at 3 depth intervals. Each sample was analyzed in the field for pH and by X-ray fluorescence (XRF) for arsenic, cadmium, copper, lead, mercury, and zinc; 52 soil samples of the 81 collected were analyzed by the laboratory for arsenic, cadmium, copper, lead, mercury, zinc, and percent moisture. Four field duplicates were submitted to the laboratory for the sampling event.

This DSR was prepared by Pioneer Technical Services, Inc. (Pioneer), 1101 S. Montana Street, Butte, Montana 59701 for:

Atlantic Richfield Company
317 Anaconda Road
Butte, Montana 59701

The information presented in this DSR includes laboratory analytical results from the sampling events.

STATEMENT OF AUTHENTICITY

Consistent with the provisions described in the 2020 U.S. Environmental Protection Agency (EPA) BPSOU Consent Decree (CD) (EPA, 2020a), the data sets referenced in this document are considered to be final data generated or evaluated. Data have been designated as enforcement quality and screening quality as described in the *Clark Fork River Superfund Site Investigations* (CFRSSI) *Quality Assurance Project Plan* (QAPP) (ARCO, 1992a) and *CFRSSI Data Management/Data Validation* (DM/DV) *Plan* (ARCO, 1992b), as supplemented by the *CFRSSI Plan Addendum* (AERL, 2000a). Consistent with the aforementioned orders, the signatories below hereby stipulate the authenticity and accuracy of the data and hereby waive any evidentiary or other objection as to the authenticity and accuracy of reference in endangerment assessments, public health evaluations, feasibility studies, and remedial design/remedial action documents.

Approved by: _____ _____
Mike Mc Anulty — Date
Liability Manager
Atlantic Richfield Company

Approved by: _____ _____
Nikia Greene — Date
Remedial Project Manager
U.S. Environmental Protection Agency
Region VIII

Approved by: _____ _____
Daryl Reed — Date
State Project Officer
Montana Department of Environmental Quality

Approved by: _____ _____
Scott Sampson — Date
Project Manager
Pioneer Technical Services, Inc.

EXECUTIVE SUMMARY

This BPSOU UR Sites DSR presents the results of the subsurface soil sampling conducted from November 2, 2021, through November 03, 2021, at the UR source area UR-01 within the BPSOU.

Sampling was conducted under the guidelines of the *BPSOU UR Sites Final Field Sampling Plan (FSP) #7: UR-01, UR-02, UR-03, UR-04, UR-15, and UR-17* (Atlantic Richfield Company, 2021a) (referred to herein as FSP) and the 2021 *Final UR Sites QAPP* (Atlantic Richfield Company, 2021b) (referred to herein as QAPP). Information and data from the sampling efforts will be used to characterize the potential contamination at the Site and evaluate potential human health and ecological risks.

This DSR includes all field XRF and soil pH data, laboratory analytical data, and data validation packages. This DSR does not include any analysis or interpretation of the data by Atlantic Richfield Company (Atlantic Richfield).

Paste pH and natural soil samples were collected from 27 sample stations (Figure 1). Each sample station was determined based on preliminary Site investigations and Agency approval.

In total, 27 sample stations were sampled by collecting 3-point composite samples at 3 depth intervals. Each sample was analyzed in the field for pH and by XRF for arsenic, cadmium, copper, lead, mercury, and zinc; 52 soil samples of the 81 collected were analyzed by the laboratory for arsenic, cadmium, copper, lead, mercury, zinc, and percent moisture. Four field duplicates were submitted to the laboratory for the sampling event. Pioneer submitted soil samples to Pace Analytical Services, LLC (Pace) in Minneapolis, Minnesota.

Analytical results were reported in a standard data package.

A data validation system was implemented consistent with the procedures described in the CFRSSI DM/DV Plan (ARCO, 1992b) and subsequent addendum (AERL, 2000a). The format for this DSR is consistent with the format established in the *CFRSSI Pilot Data Report Addendum* (AERL, 2000b).

1.0 INTRODUCTION

This report presents the results of soil sampling and analysis for the UR Sites investigation conducted from November 2, 2021, through November 3, 2021, at the UR source area UR-01 within the Silver Bow Creek/Butte Area National Priorities List Site BPSOU area. Activities were consistent with the provisions described in Appendix D of the BPSOU CD (EPA, 2020a). Historical results from previous investigations are summarized in the FSP. The information contained in this report was gathered according to objectives and procedures documented in the FSP and according to the overall soil sampling, analysis objectives, and requirements outlined in the QAPP.

Information referenced throughout this DSR is included in the appendices below:

- Attachment A Data Validation Report (DVR).
- Attachment B Field Forms and Related Documents.
- Attachment C Laboratory Data Packages.
- Attachment D Electronic Data Deliverable File (included separately).

This investigation's field notebook and datasheets are located at the Atlantic Richfield Contractor (Pioneer) office in Butte, Montana.

All characterization activities and procedures in 2021 followed the QAPP. Sample stations were determined based on preliminary Site investigations and Agency approval. The QAPP describes the quality assurance (QA) and quality control (QC) policies and procedures used during sample collection and analysis. Samples were obtained from the sample stations identified in Table 1 and listed below, following the FSP.

Station Field Identification	Sample Identification
UR-01-SS-01	BPSOU-UR01SS01-110321-X
UR-01-SS-02	BPSOU-UR01SS02-110321-X
UR-01-SS-03	BPSOU-UR01SS03-110321-X
UR-01-SS-04	BPSOU-UR01SS04-110321-X
UR-01-SS-05	BPSOU-UR01SS05-110321-X
UR-01-SS-06	BPSOU-UR01SS06-110321-X
UR-01-SS-07	BPSOU-UR01SS07-110321-X
UR-01-SS-08	BPSOU-UR01SS08-110221-X
UR-01-SS-09	BPSOU-UR01SS09-110221-X
UR-01-SS-10	BPSOU-UR01SS10-110221-X
UR-01-SS-11	BPSOU-UR01SS11-110221-X
UR-01-SS-12	BPSOU-UR01SS12-110221-X
UR-01-SS-13	BPSOU-UR01SS13-110221-X
UR-01-SS-14	BPSOU-UR01SS14-110221-X
UR-01-SS-15	BPSOU-UR01SS15-110221-X
UR-01-SS-16	BPSOU-UR01SS16-110221-X
UR-01-SS-17	BPSOU-UR01SS17-110221-X
UR-01-SS-18	BPSOU-UR01SS18-110221-X
UR-01-SS-19	BPSOU-UR01SS19-110221-X
UR-01-SS-20	BPSOU-UR01SS20-110221-X
UR-01-SS-21	BPSOU-UR01SS21-110221-X
UR-01-SS-22	BPSOU-UR01SS22-110221-X
UR-01-SS-23	BPSOU-UR01SS23-110221-X
UR-01-SS-24	BPSOU-UR01SS24-110221-X
UR-01-SS-25	BPSOU-UR01SS25-110221-X
UR-01-SS-26	BPSOU-UR01SS26-110221-X
UR-01-SS-27	BPSOU-UR01SS27-110221-X
UR-01-OP-01	BPSOU-UR01OP01-110221-X

*X indicates sample depth interval.

Samples collected were analyzed by XRF. A subset of the samples was sent to Pace in Minneapolis, Minnesota for laboratory analyses as listed in Section 3.1.4, Table 5 of the QAPP. The data verification and validation for the XRF and laboratory results are included in Attachment A. All data included in this report are provided as final.

Personnel from Pioneer completed the soil sampling activities. The soil data collected had to undergo rigorous sampling and analysis procedures and meet QA/QC protocols and documentation requirements to be designated as enforcement quality. All metals data underwent a Stage 2A

verification and validation according to EPA *National Functional Guidelines for Inorganic Superfund Data Review* (EPA, 2020b) and EPA *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA, 2009). All metals data presented herein have undergone data validation according to the CFRSSI DM/DV Plan Addendum (AERL, 2000a). Section 3.0 and Attachment A provide information about data quality and validation.

This DSR contains the following information:

- Investigation objectives (Section 1.1).
- Site description and background (Sections 1.2 and 1.3).
- Data quality assessment (DQA) (Section 2.0).
- Project objectives and sampling design review (Section 2.1).
- Preliminary data review (Section 2.2).
- Conclusions on the quality of the data (Section 2.3).
- Sampling and analysis summary (Section 3.0).
- Deviations (Section 4.0).

The Standard Operating Procedures (SOPs) followed were developed by Pioneer according to the *CFRSSI SOPs* (ARCO, 1992c) and are included in the QAPP. The SOPs were followed for sampling, data collection, and field/office protocols.

1.1 Investigation Objectives

The QAPP listed the following two objectives:

- The Site will be sampled at 3 depth intervals [(1) 0 to 2 inches, (2) 2 to 6 inches, and (3) 6 to 12 inches] at the Site-specific approved sample stations.
- Opportunistic samples may be obtained in the field at the discretion of field sampling personnel or Agency oversight representative(s). The field team leader will be responsible for determining the appropriate sampling protocol as dictated by the location of the opportunistic sample(s).

The results of the investigation will supplement existing data contained within the Atlantic Richfield Geocortex historical database cited in the FSP. This data will be used to make a Site declaration specifying any areas that do not meet the human health or storm water criteria per Table 1 and Table 2 in the QAPP.

1.2 Investigation Site Description

The UR Sites within the BPSOU could pose a threat to human health or surface water quality due to the presence of historical mine waste. Although many source areas have been previously reclaimed, areas still exist in which soil has not yet been evaluated; such Sites may provide a pathway for human exposure or impact surface water quality via storm water runoff. The UR-01 Site was assessed per the QAPP.

This DSR describes the activities conducted for soil sampling and characterization at the UR-01 Site. Supplemental information provided in the FSP (Atlantic Richfield Company, 2021a) described the 2021 investigation. Sample stations were determined based on preliminary Site investigations and Agency approval to quantify the potential of human health impacts and/or storm water impacts at depth intervals of 6 to 12 inches, 2 to 6 inches, and 0 to 2 inches.

The following figure summarizes the 2021 sampling effort:

- Figure 1 displays proposed and sampled stations for the 2021 sampling event.

1.3 Background

Site UR-01 is approximately 5.44 acres and is located north of Walkerville, Montana, and just north of the Alice Pit. The Site is bounded on the south by North Alice Street and on the north by Ryan Road (Figure 1). Ownership of Site includes Atlantic Richfield Company and a private third party. Site UR-01 is vacant land with well-established vegetation and several bare areas, including windrows of dumped material. The dumped material is covered with established weeds and grasses. An erosion rill starting from the middle of the Site running northwest into the drainage ditch appears to have iron staining and impacted soil. There are residences within 200 feet of UR-01 in several directions. Site UR-01 is in the Beef Straight Gulch drainage basin.

2.0 DATA QUALITY OBJECTIVES AND ASSESSMENT

The objective of the DQA process (EPA, 2000) is to determine whether the project-specific objectives have been satisfied and if the analytical results are acceptable for project decision making. The DQA process consists of five steps that relate the quality of the results to the intended use of the data:

Step 1: Review sampling design (Section 2.1).
Step 2: Conduct preliminary data review (Section 2.2).
Step 3: Select statistical test(s) as appropriate to evaluate data quality (not applicable).
Step 4: Verify assumptions (not applicable).
Step 5: Draw conclusions about the quality of the data (Section 2.3).

2.1 Project Objectives and Sampling Design Review

Project-specific objectives were defined in the FSP to cover the sampling design requirements outlined in the QAPP.

2.2 Preliminary Data Review

A preliminary data review was conducted to determine if any problems or anomalies were present in the sample collection and analysis procedures. This was completed by evaluating data quality indicators (Section 2.2.1) followed by data verification and validation (Attachment A).

2.2.1 Data Quality Indicators

The DQA process evaluates the results against data quality indicators of precision, accuracy, representativeness, comparability, completeness, and sensitivity. An evaluation of each data quality indicator is included in the DVR (Attachment A).

2.3 Data Quality Conclusions

The laboratory samples were collected using standard sampling methods and relevant Pioneer SOPs. The sampling design, SOPs, and laboratory analytical methods were based on EPA and other industry-standard practices. The analytical laboratories performed the sample analyses using industry-standard methods. Laboratory analytical methods are provided in Table 5 of the QAPP. Sample collection was completed by professionals properly trained in following SOPs and using the equipment. Proper chain of custody and sample handling activities were observed during sample collection, delivery to the laboratory, and analysis. The validation checklists are included in the DVR (Attachment A), all data met the Level A and Level B criteria.

Data generated from the samples collected were examined to ensure that project objectives were met. The data quality objectives for the investigation are listed in the QAPP Section 2.4. A data QA/QC review was completed for the sampling event.

For the 2021 Site sampling event, a total of 81 natural soil samples were collected. All samples were analyzed by XRF, and 52 samples were sent to Pace for laboratory analysis. This resulted in a total of 486 natural data points generated by the XRF analyses and 364 natural data points generated by the laboratory analysis. Of the points, 85 (17%) XRF natural data points were designated screening quality, and 401 (83%) XRF natural data points were designated as enforcement quality. For the laboratory natural data points, 24 (7%) were designated screening quality, and 340 (93%) laboratory natural data points were designated as enforcement quality. No data were rejected. The DVR (Attachment A) includes a summary of the analysis. Please note that 81 of the 85 (95%) screening quality XRF data points were qualifications made to the mercury results due to the lack of a calibration check sample (Section 2.2.3 of the DVR). Based on the data quality conclusions in the DSR, the data analyzed in the 2021 sampling event were deemed usable.

3.0 SAMPLING AND ANALYSIS SUMMARY

This section summarizes completed tasks that addressed the monitoring objectives described in the QAPP, including sampling methods, field analysis methods, and analytical results for the UR soil sampling.

3.1 Soil Sample Collection

Samples were collected following procedures detailed in the QAPPs referenced in Section 1.0, except where modifications of the sampling design or procedures were required. Any modifications are listed in Section 4.0. Sample station locations were selected in cooperation and agreement with Agency oversight personnel.

The general sampling approach consisted of hand-dug pits. The UR Site sampling proceeded as follows.

Sample stations were determined based on preliminary Site investigations and the Agency-approved FSP. Field personnel and representatives from the Agencies (when present) made decisions regarding collection of additional "opportunistic" samples to characterize the Site conditions and characteristics accurately. A minimum of 3 combination samples (9 subsamples) were collected in a 3-point (triangular) pattern. At each point, a subsample of predetermined depth was collected. As a rule, the diagonal distance between the points was 10 feet, depending on the area of soil homogeneity. The diagonal distance could be adjusted in the field to account for soil differences and the presence of obstacles. Three discrete aliquots of equal amounts of soil from each designated subsample location were composited into 1 sample. Materials such as plant matter, debris, and large rocks were removed, to a reasonable extent, prior to placing the sample in the sample container for laboratory analysis. A portion of the natural sample was placed into a #10 (2 millimeter) disposable sieve screen prior to running the XRF analysis and a portion was used for pH analysis. After XRF analysis was complete, the sample was archived in the Pioneer Butte, Montana, office. Samples were collected from the 0- to 12-inch depth at 0- to 2-inch, 2- to 6-inch, and 6- to 12-inch intervals.

3.1.1 Sample Analysis

3.1.1.1 pH

The general UR Site pH analysis proceeded as follows per SOP-SFM-01 in Attachment B of the QAPP:

Composite paste pH samples were collected using disposable trowel scoops, plastic cups, and deionized (DI) water. Roughly 1 inch of fine material was scooped from the sieved material into the bottom of the cup. The DI water was added to the sample, and the cup was swirled until a paste was made. Soil pH are included in Attachment B. The Hanna Instruments HI 99121 meter was used to measure the paste pH sample. The meter was decontaminated with DI water after each use. The collected soil was returned to the area where the sample was collected, and the tools were discarded.

3.1.1.2 XRF

The general XRF analysis proceeded as follows per SOP-SFM-02 in Attachment B of the QAPP:

Field personnel thoroughly homogenized the natural sample in the bag by kneading the soil, split roughly 1 disposable trowel scoop from the natural sample, and placed the split sample into a #10 sieve inside a gallon resealable plastic bag (i.e., Ziploc™). The sieved sample was transferred into an additional 1-quart resealable plastic bag so that it fit in the analyzer measurement stand. The material was compacted so that there was a flat surface on the area to be analyzed and visually inspected to ensure that only fines were present. The sample bag was placed on the XRF stand and analyzed. The results were recorded for the selected metals on the XRF field datasheet. Field

personnel completed duplicate and replicate XRF analyses on at least 5% of the samples analyzed in the XRF unit.

Soil samples for arsenic, cadmium, copper, mercury, lead, zinc, percent moisture, and associated QA/QC samples were packaged and shipped to Pace for analysis. Field forms are in Attachment B, analytical reports are in Attachment C, data deliverable files are in Attachment D, and soil results (including QA/QC samples), applicable laboratory flags, data validation qualifiers, and reason codes are included in the tables in the DVR in Attachment A.

3.1.1.3 Laboratory Samples

The general laboratory sampling proceeded as follows per SOP-S-01 and SOP-SA-01 in Attachment B of the QAPP:

Composite soil samples were collected in a labeled plastic bag and homogenized after each subsample was collected. After the sample was collected from the 3-point composite, a portion of the sample was removed and placed in a #10 sieve within a separate resealable plastic bag (XRF analysis described in Section 3.1.1.2 above). Field personnel then sent every 1 per 10 samples, with additional samples sent to the laboratory for confirmation if the field results were within the COC action/screening levels (Table 1 and Table 2 within the QAPP) at 35% above and 35% below. Laboratory samples were analyzed for arsenic, cadmium, copper, lead, mercury, zinc, and percent moisture.

4.0 DEVIATIONS

During the sampling event, there were two deviations to the QAPP or FSP as described below:

- Sample station UR-01-SS-14 was not sampled due to private third-party ownership. UR-01-OP-01 was collected to meet the sampling frequency. There is an adequate sample density near sample UR-01-SS-14.

5.0 REFERENCES

AERL, 2000a. Clark Fork River Superfund Site Investigations Data Management/Data Validation Plan Addendum. June 2000.

AERL, 2000b. Clark Fork River Superfund Site Pilot Data Report Addendum. July 2000.

ARCO, 1992a. Clark Fork River Superfund Site Investigations Quality Assurance Project Plan. May 1992. Prepared by PTI Environmental Services.

ARCO, 1992b. Clark Fork River Superfund Site Investigations Data Management/Data Validation Plan. May 1992. PTI Environmental Services, Contract C 117-06-64, April 1992.

ARCO, 1992c. Clark Fork River Superfund Site Investigations Standard Operating Procedures. September 1992.

Atlantic Richfield Company, 2021a. BPSOU Unreclaimed Sites Draft Final Field Sampling Plan Package #7. October 2021.

Atlantic Richfield Company, 2021b. Final Unreclaimed Sites Quality Assurance Project Plan. June 2021.

EPA, 2000. Guidance for Data Quality Assessment: Practical Methods for Data Analysis. EPA QA/G-9. U.S. Environmental Protection Agency, July 2000.

EPA, 2009. Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use. U.S. Environmental Protection Agency, January 2009.

EPA, 2020a. Consent Decree for the Butte Priority Soils Operable Unit. Partial Remedial Design/Remedial Action and Operation and Maintenance. U.S. Environmental Protection Agency. February 13, 2020. (Appendix A of the CD contains the EPA 2006 Record of Decision, 2011 Explanation of Significant Differences to the 2006 Record of Decision, and the 2020 Record of Decision Amendment). Available at https://www.co.silverbow.mt.us/2161/ButtePriority-Soils-Operable-Unit-Conse.

EPA, 2020b. U.S. Environmental Protection Agency National Functional Guidelines for Inorganic Superfund Data Review, January 2017.

Figures

Figure 1. Unreclaimed Sites UR-01 Sample Stations

2021 SAMPLED STATIONS
PROPOSED SAMPLE STATIONS
HISTORIC SAMPLE STATION
UNRECLAIMED SITES BOUNDARY

N

DISPLAYED AS:
PROJECTION/ZONE: MSP
DATUM: NAD 83
UNITS: INT'L FT
SOURCE: PIONEER/BSB/AR/QSI 2020

0 62.5 125 250
Feet

FIGURE 1

PIONEER TECHNICAL SERVICES, INC.

Unreclaimed Sites
UR-01
2021 Sample Stations

DATE: 4/29/2022

Path: Z:\Shared\Active Projects\ARCO\BPSOU\LandSupport\SolidMedia\Insufficiently_Unreclaimed\UR_Sampling\Unreclaimed_Samplelocations_UR01.mxd

Tables

Table 1. Coordinates for Sample Stations and Identification

Table 1. Coordinates for Sample Stations and Identification			
Station Field Identification	Sample Identification	Northing	Easting
UR-01-SS-01	BPSOU-UR01SS01-110321-X	665660.718	1196755.77
UR-01-SS-02	BPSOU-UR01SS02-110321-X	665675.996	1196877.298
UR-01-SS-03	BPSOU-UR01SS03-110321-X	665635.371	1196935.283
UR-01-SS-04	BPSOU-UR01SS04-110321-X	665650.649	1197068.269
UR-01-SS-05	BPSOU-UR01SS05-110321-X	665672.177	1197173.477
UR-01-SS-06	BPSOU-UR01SS06-110321-X	665679.468	1197268.269
UR-01-SS-07	BPSOU-UR01SS07-110321-X	665733.288	1197262.713
UR-01-SS-08	BPSOU-UR01SS08-110221-X	665616.968	1197362.019
UR-01-SS-09	BPSOU-UR01SS09-110221-X	665665.927	1197407.678
UR-01-SS-10	BPSOU-UR01SS10-110221-X	665760.892	1197378.685
UR-01-SS-11	BPSOU-UR01SS11-110221-X	665915.336	1197361.498
UR-01-SS-12	BPSOU-UR01SS12-110221-X	665866.898	1197432.331
UR-01-SS-13	BPSOU-UR01SS13-110221-X	665824.711	1197408.373
UR-01-SS-15	BPSOU-UR01SS15-110221-X	665722.888	1197491.966
UR-01-SS-16	BPSOU-UR01SS16-110221-X	665676.534	1197561.237
UR-01-SS-17	BPSOU-UR01SS17-110221-X	665803.357	1197556.289
UR-01-SS-18	BPSOU-UR01SS18-110221-X	665946.325	1197590.924
UR-01-SS-19	BPSOU-UR01SS19-110221-X	665979.398	1197645.091
UR-01-SS-20	BPSOU-UR01SS20-110221-X	665857.784	1197623.216
UR-01-SS-21	BPSOU-UR01SS21-110221-X	665837.732	1197680.508
UR-01-SS-22	BPSOU-UR01SS22-110221-X	665711.43	1197623.216
UR-01-SS-23	BPSOU-UR01SS23-110221-X	665682.784	1197652.122
UR-01-SS-24	BPSOU-UR01SS24-110221-X	665832.263	1197751.341
UR-01-SS-25	BPSOU-UR01SS25-110221-X	665818.461	1197809.934
UR-01-SS-26	BPSOU-UR01SS26-110221-X	665740.076	1197777.382
UR-01-SS-27	BPSOU-UR01SS27-110221-X	665724.451	1197849.257
UR-01-OP-01	BPSOU-UR01OP01-110221-X	665804.138	1197691.445

*Datum used is NAD83

Attachment A
Data Validation Report (DVR)

SILVER BOW CREEK/BUTTE AREA NPL SITE
BUTTE PRIORITY SOILS OPERABLE UNIT

Draft Final

2021 Unreclaimed Sites Sampling UR-01
Data Validation Report

Atlantic Richfield Company

May 2022

SILVER BOW CREEK/BUTTE AREA NPL SITE
BUTTE PRIORITY SOILS OPERABLE UNIT

Draft Final

2021 Unreclaimed Sites Sampling UR-01
Data Validation Report

Prepared for:

Atlantic Richfield Company
317 Anaconda Road
Butte, Montana 59701

Prepared by:

Pioneer Technical Services, Inc.
1101 South Montana Street
Butte, Montana 59701

May 2022

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ACRONYMS AND ABBREVIATIONS

Acronym	Definition
%R	Percent Recovery
BPSOU	Butte Priority Soils Operable Unit
CCS	Calibration Check Sample
CFRSSI	Clark Fork River Superfund Site Investigation
COC	Contaminants Of Concern
DM/DV	Data Management/Data Validation
DV	Data Validation
DVR	Data Validation Report
EPA	U.S. Environmental Protection Agency
FSP	Field Sampling Plan
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LDS	Laboratory Duplicate Sample
LMS	Laboratory Matrix Spike
LMSD	Laboratory Matrix Spike Duplicate
LOD	Limit of Detection
MB	Method Blank
MDL	Method Detection Limit
mg/kg	milligram per kilogram
NFG	National Functional Guidelines
Pace	Pace Analytical Services, LLC
Pioneer	Pioneer Technical Services, Inc.
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference
SDG	Sample Delivery Group
SiO_2	Silicon Dioxide
SOP	Standard Operating Procedure
UR	Unreclaimed
XRF	X-Ray Fluorescence

DOCUMENT MODIFICATION SUMMARY

Revision No.	Author	Version	Description	Date
Rev 0	Sara Ward	Draft	Issued for Internal Review	3/18/2022
Rev 1	Sara Ward	Draft Final	Submitted to Agencies	05/24/2022

1.0 DATA VALIDATION REPORT SUMMARY

This Data Validation Report (DVR) summarizes the X-ray fluorescence (XRF) and laboratory analytical results from samples collected from the Unreclaimed (UR) UR-01 Site (referred to as Site). The samples were collected per the *Final Butte Priority Soils Operable Unit (BPSOU) Unreclaimed Sites Field Sampling Plan (FSP) Package #7: UR-01, UR-12, UR-03, UR-04, UR-15, and UR-17* (Atlantic Richfield Company, 2021a) (referred to herein as the FSP). The 2021 UR-01 sampling event included samples collected under the 2021 *Unreclaimed Sites Quality Assurance Project Plan* (QAPP) (Atlantic Richfield Company, 2021b) (referred to herein as the QAPP).

All data have undergone a Stage 2A data validation (DV) as defined in the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA, 2009). The DV was conducted in accordance with the QAPP, the *Clark Fork River Superfund Site Investigation* (CFRSSI) *Data Management* (DM)/*DV Plan* (ARCO, 1992a) and *CFRSSI DM/DV Plan Addendum* (AERL, 2000), the *CFRSSI QAPP* (ARCO, 1992b), *EPA National Functional Guidelines (NFG) for Inorganic Methods Superfund Data Review* (EPA, 2020), analytical methods, and laboratory standard operating procedures (SOPs). The 2020 EPA NFG for Inorganic Methods Superfund Data Review was followed since it is the most current version. This report details the evaluation of field XRF and laboratory data for the purpose of usability.

This document refers to the tables and attachments below.

- Table A1 contains the natural sample results with laboratory qualifiers; DV qualifiers; enforcement, screening, and rejected classifications; and DV reason codes.
- Table A2 contains the field duplicate pair samples with results, laboratory qualifiers, DV qualifiers, DV reason codes, and quality control (QC) criteria assessment.
- Table A3 contains sample identification information including the field sample name, sample type, sample location, laboratory sample name, sample date, analytical methods, and analytes.
- Table A4 contains the definitions for the laboratory qualifiers; DV qualifiers; enforcement, screening, and rejected classification codes; and DV reason codes.
- Table A5 contains the XRF Silicon Dioxide (SiO_2) Standard and Calibration Check Sample (CCS) results.
- Table A6 contains the XRF duplicate and replicate sample results and QC criteria assessment.
- Attachment 1 contains DV checklists. Attachment 1.1 and Attachment 1.2 contain the checklists for XRF analysis and laboratory analysis, respectively.
- Attachment 2 contains the Level A/B Assessment Checklist.
- Attachment 3 contains the QC criteria used in the DV process.

The instrument output for XRF data, produced by Pioneer Technical Services, Inc. (Pioneer), was used to perform the DV of the XRF results, and the standard data packages received from Pace Analytical Services, LLC (Pace) were used to perform the DV of the laboratory results.

All data met the Level A and B criteria. Based on the validation process outlined in the CFRSSI DM/DV Plan (ARCO, 1992a), the quality of the data is ranked as enforcement quality, screening quality, or it is rejected. Enforcement quality data are defined in the CFRSSI DM/DV Plan as data that meet the Level A and B criteria (Attachment 2) and are not qualified as estimated or rejected after the DV process. For sample results qualified as estimated "J" by the laboratory because the reported result is between the method detection limit (MDL) and analytical reporting limit (RL), values are considered enforcement data if no other qualifiers were required during validation. Enforcement quality data may be used for all purposes under the Superfund program including the following: site characterization, health and safety, Engineering Evaluation/Cost Analysis, remedial investigation/feasibility studies, evaluation of alternatives, confirmational purposes, risk assessments, and engineering design. As all samples met the Level A and B documentation criteria, the results that were not qualified as estimated (e.g., J, J+, J-, or UJ) or rejected for some exceedance of quality assurance (QA)/QC criteria were considered "enforcement" quality data and were assigned an "E" in Table A1. Screening quality data, as defined in the CFRSSI DM/DV Plan, are those samples that do not meet the Level B criteria and/or were qualified as estimated (e.g., J, J+, J-, or UJ) during the DV process. Potential uses of screening quality data, depending on their quality, include site characterization, determining the presence or absence of contaminants, developing or refining sampling and analysis techniques, determining relative concentrations, scoping and planning for future studies, engineering studies and engineering design, and monitoring during implementation of the response action. Sample results that were qualified as estimated during the validation process were considered "screening" quality data and assigned an "S" in Table A1.

Data rejected during DV cannot be used for any Superfund activities. No results were rejected.

The summary of data points in this DVR includes only the natural samples and does not include the field QC samples (the field duplicate). Note that the field QC samples underwent the same DV procedures as the natural samples and the results are included on the DV checklists in Attachment 1. The qualifications made to field QC samples are listed in Table A2; however, the qualifications made to these samples are not included in the summary of qualifications made to natural data points, and the field QC samples are not included in Table A1.

For the 2021 Site sampling event, a total of 81 natural soil samples were collected. All samples were analyzed in the field by XRF, and 52 samples were sent to Pace for laboratory analysis of metals. This resulted in a total of 486 natural data points generated by the XRF analyses and 364 natural data points generated by the laboratory analysis. Sample station UR-01-SS-14 was not sampled due to third party ownership. An additional sample station, UR-01-OP-01, was sampled to meet the requirements of the FSP.

A summary by analysis type is shown below:

Analysis Type	Natural Samples	Data Points	Enforcement Quality Data Points (% of total)	Screening Quality Data Points (% of total)	Rejected Data Points (% of total)
XRF	81	486	401 (83%)	85 (17%)	0 (0%)
Pace	52	364	340 (93%)	24 (7%)	0 (0%)

Please note that 81 of the 85 (95%) screening quality XRF data points were qualifications made to the mercury results due to the lack of a CCS with a known amount of mercury, as discussed in Section 2.2.3.

Table A1 shows the laboratory qualifiers, DV qualifiers, enforcement or screening designators, and the reason code for the qualification for each natural data point.

2.0 QUALITY ASSURANCE/QUALITY CONTROL REVIEW OF INORGANIC DATA

The QC criteria used during the DV process are listed in Attachment 3.

For XRF data, the QC criteria were derived from the QAPP, the CFRSSI DM/DV Plan (ARCO, 1992a) and DM/DV Plan Addendum (AERL, 2000), the CFRSSI QAPP (ARCO, 1992b), the Niton XL3 Mining QC Sheet (ThermoFisher Scientific, 2014), and the Pioneer SOP for operating the XL3 XRF analyzer (SOP-SFM-02) (included in the QAPP).

For laboratory data, the QC criteria were derived from the QAPP, CFRSSI DM/DV Plan Addendum (AERL, 2000), the NFG for Inorganic Superfund Data Review (EPA, 2020), analytical methods, and method-specific laboratory SOPs.

The DV checklists derived from the CFRSSI DM/DV Addendum (AERL, 2000) were completed for the XRF data and each laboratory report (Attachment 1). Below are the deviations made to the checklists provided in the CFRSSI DM/DV Addendum guidance document:

- The Laboratory DV Checklist for Metals Analysis by Spectrace XRF was revised slightly to more accurately reflect the information provided by the XRF Analyzer (Niton XL3). The checklist is included in Attachment 1.1. The guidelines for XRF QA and QC are listed in Section 3.6 (Quality Assurance/Quality Control) of the QAPP.

- The Laboratory DV Checklist for Metals Analysis by Inductively Coupled Plasma or Graphite Furnace Atomic Absorption Spectrometry was revised slightly to more accurately reflect the information provided in the full data packages provided by Pace and the requirements listed in the NFG (EPA, 2020). The checklist is included in Attachment 1.2.

- The DV Checklist for Field QC was not filled out for each data package. Sections on field duplicates were added to each Laboratory DV Checklist worksheet.

The relevant DV checklists were completed for each sample delivery group (SDG) and included the DV performed for the methods and analytes listed below:

Data Validation Checklist	Method	Analyte(s)
XRF	XRF	Arsenic, cadmium, copper, lead, mercury, and zinc
Laboratory: Pace	EPA 6010D	Arsenic, cadmium, copper, lead, and zinc
	EPA 7471B	Mercury
	ASTM D2974	Percent Moisture

One Level A/B Assessment was completed for the Site (Attachment 2).

2.1 Field Quality Control Samples

The QAPP requirement for field duplicate collection frequency is 1 field duplicate sample per 20 natural samples or once per sampling event, whichever is more frequent. Disposable sampling equipment was used to collect soil samples; therefore, equipment rinsate blanks were not collected.

Any qualifications required based on the field QC sample results are detailed in the DV checklists (Attachment 1) and are listed in Table A1 and Table A2.

Please note that although the field QC samples (field duplicate samples) may receive a qualifier during the DV process, the enforcement and screening quality summaries and the precision and accuracy assessment summaries do not include the field QC sample results. Only the results of the natural samples are included in the data quality assessment summaries.

2.1.1 Field Duplicate

During the sampling event, 4 field duplicate samples were collected for the 52 natural samples submitted to Pace for analysis (7.7%); therefore, the collection frequency requirement for field duplicates (5%) was met.

The analytical RLs presented in the laboratory reports were used to evaluate the field duplicates. The field duplicate QC criteria assessments are listed in Table A2.

For the 81 natural XRF samples collected at the Site, 5 field duplicate samples (6.2%) were analyzed; therefore, the collection frequency requirement for field duplicates (5%) was met.

The QC criteria used to assess field duplicate pair results during DV are listed in Attachment 3. The field duplicate sample pairs and QC criteria assessments are listed in Table A2. If a field duplicate result was outside the control limit, the parent sample and any samples considered sufficiently similar were qualified as specified in Attachment 3. Any qualifications made to natural samples based on the field duplicate sample results are detailed in the DV checklists (Attachment 1) and are listed in Table A1 and Section 4.1.

2.1.2 Equipment Rinsate Blank

Disposable sampling equipment was used to collect soil samples; therefore, equipment rinsate blanks were not collected.

2.2 XRF Quality Control Samples

This section summarizes the XRF QC samples evaluated during the DV of the XRF results.

2.2.1 Energy Calibration Check

The energy calibration check determines whether the characteristic X-ray lines are shifting, which would indicate drift within the instrument. The requirement set forth in the QAPP was the performance of the preprogrammed energy calibration check on the equipment at the beginning of each working day. During the sampling event, the energy calibration check was performed at the beginning of each working day.

2.2.2 Silicon Dioxide Standard

The SiO_2 standard, as provided by Niton, is a "clean" quartz or SiO_2 matrix that contains concentrations of selected analytes near or below the machine's lower limit of detection. Analysis results with the XRF instrument of this SiO_2 standard are used to monitor for cross contamination. The frequency requirement for SiO_2 standard sample analysis set forth in the QAPP is to complete analysis of this sample at the beginning of each day, once per every 20 samples, and at the end of each day's run sequence.

During the sampling event, the frequency requirement for SiO_2 standard samples was met. Results are listed on Table A5.

The SiO_2 standard sample results were within the control limits.

2.2.3 Calibration Check Samples

The CCSs helps check the accuracy of the XRF instrument and assess the stability and consistency of the analysis for the analytes of interest. The CCSs used were the Niton-provided Standard Reference Materials: NIST 2709a- Joaquin Soil (NIST 2709a) sample and a Resource Conservation and Recovery Act sample.

The frequency requirement for CCS analysis set forth in the QAPP is to complete analysis of at least 1 CCS at the start of each day, once per every 20 samples, and as the last analysis each day. The frequency requirement for CCS analyses was met. Results are listed on Table A5.

> The CCS results were within the control limits. However, there was no CCS that had a known amount of mercury greater than the limit of detection (LOD) for mercury. Therefore, all detected mercury results have been qualified "J" and all non-detected

mercury results have been qualified “UJ.” This resulted in 81 mercury results qualified “UJ” due to the lack of an appropriate CCS.

Qualification due to lack of an appropriate CCS standard are listed in Table A1.

2.2.4 XRF Duplicate and XRF Replicate Samples

The XRF duplicate and XRF replicate samples help check the precision of the XRF sampling method and instrument. The XRF duplicate sample was analyzed by removing the sample bag from the analytical stand, kneading it once or twice, and analyzing a second time. The XRF replicate sample was analyzed immediately following the primary sample analysis by restarting the XRF to analyze the same sample a second time with the same soil in the XRF aperture.

The frequency requirement for XRF duplicate and XRF replicate samples set forth in the QAPP is the analysis of each sample once per every 20 samples (5%).

For the 81 natural XRF samples collected at the Site, 5 duplicate sample (6.2%) and 5 replicate sample (6.2%) were analyzed. Therefore, the frequency requirement for XRF duplicate and XRF replicate samples (5%) was met for the Site.

Table A6 contains the XRF duplicate and XRF replicate sample pair results with the parent sample results and the QC criteria assessment. If the results were outside the control limit, the parent sample and any sample considered sufficiently similar were qualified “J” if the result was detected and “UJ” if the result was not detected.

Qualifications due to XRF duplicate and XRF replicate sample results outside the control limit are listed in Table A1 and discussed in Section 4.1.1.

2.3 Laboratory Quality Control Samples

The laboratory QC sample types vary depending on analytical method. The QC criteria used during DV to evaluate the applicable laboratory QC samples are listed in Attachment 3 and Section 3.6 of the QAPP.

The Stage 2A DV includes the evaluation of the following laboratory QC items as applicable per analytical method:

Holding Times.
Preservation.
Method Blanks (MB).
Laboratory Control Sample (LCS) and LCS Duplicates (LCSD).
Laboratory Duplicate Samples.
Laboratory Matrix Spike (LMS) and LMS Duplicates (LMSD).

The analytical RLs produced by each laboratory were used to evaluate the laboratory duplicates. The laboratory MDLs were used for the data review and validation of laboratory MB samples.

The appropriate laboratory QC samples were analyzed with each sample group. Any qualifications required based on the laboratory QC sample results are detailed in the DV checklists (Attachment 1) and are listed in Table A1. Also refer to Section 4.1 and Section 4.2.

3.0 LEVEL A/B ASSESSMENT SUMMARY

Data that meet the Level A and Level B criteria and are not qualified as estimated or rejected are assessed as enforcement quality data and can be used for all Superfund purposes and activities. Data that meet only the Level A criteria and are not rejected can be assessed as screening quality data.

Screening quality data can be used only for certain activities, which include engineering studies and design. Data that do not meet both the Level A and B criteria are designated as unusable. The Level A/B Assessment Checklist for all samples collected for the Site are included as Attachment 2. Sample collection information was recorded in the field logbook, including sample collection date, location, and collection method. This information was reviewed for the Level A/B criteria.

As shown in Attachment 2, all the samples met both Level A and Level B criteria. No data were designated screening quality or rejected based on the results of Level A/B assessment.

4.0 PRECISION, ACCURACY, REPRESENTATIVENESS, COMPARABILITY, COMPLETENESS, AND SENSITIVITY DATA SUMMARY

This section provides the precision, accuracy, representativeness, comparability, completeness, and sensitivity assessment for the XRF and laboratory data generated from samples collected during the 2021 Site sampling event.

4.1 Precision

Precision is the amount of scatter or variance that occurs in repeated measurements of a particular analyte.

4.1.1 XRF Precision

The precision control limit used for XRF soil samples was a relative percent difference (RPD) less than 35% when both sample results were detections. For XRF data, the precision assessment is based on the RPD of XRF duplicate, XRF replicate, and field duplicate sample pairs. If an RPD was outside the control limit, the parent sample and samples considered sufficiently similar to the parent sample were qualified. No natural samples were considered sufficiently similar enough to each other to require additional qualifications based on the variability of soil matrices. If the parent sample was a duplicate sample, the duplicate sample's parent sample was considered sufficiently similar and was qualified when applicable.

There were 3 instances where the XRF duplicate pair results did not meet the control limit, 2 instances where the XRF replicate pair results did not meet the control limit, and 1 instance where the field duplicate pair results did not meet the control limit. This resulted in qualification of 4 natural data points due to XRF precision.

The natural samples qualified for poor XRF duplicate precision (DV Reason Code = D%), poor XRF replicate precision (DV Reason Code = R%), and poor field duplicate precision (DV Reason Code = FD) are listed below:

Field Sample ID	Method	Analyte	DV Qualifier	DV Reason Code
BPSOU-UR01SS15-110221-2	XRF	Lead	J	D%
BPSOU-UR01SS13-110221-3	XRF	Arsenic	J	D%, R%
BPSOU-UR01SS05-110321-2	XRF	Lead	J	D%, R%
BPSOU-UR01SS07-110321-1	XRF	Lead	J	FD

This resulted in 4 (1%) of the 486 natural XRF data points that did not meet the precision requirements, and 482 (99%) of the 486 natural XRF data points that did meet the precision requirements.

4.1.2 Laboratory Precision

Acceptance or rejection of precision measurements is based on the RPD of the laboratory and field duplicates. For example, perfect precision would be a 0% RPD between duplicate samples (both samples have the same analytical result) for results that are greater than 5 times the laboratory RL. For total metals analysis, when both results are greater than 5 times the RL, acceptable precision is an RPD of plus or minus 35% in soil samples. For samples with 1 or both results less than 5 times the RL (including non-detect), acceptable precision is met if the absolute difference between the 2 sample results is less than 2 times the RL. This precision requirement is from Section 2.4.1 of the CFRSSI QAPP (ARCO, 1992b).

There were two instances where the field duplicate pair results from Pace did not meet the control limit and one instance where the laboratory duplicate pair results did not meet the control limit. This resulted in the qualification of three natural data points due to field duplicate and laboratory duplicate precision.

The natural samples qualified for poor field duplicate precision (DV Reason Code = FD) and poor laboratory duplicate precision (DV Reason Code = D%) are listed below:

Field Sample ID	Method	Analyte	DV Qualifier	DV Reason Code
BPSOU-UR01SS02-110321-2	SW-846 6010D	Lead	J	FD
BPSOU-UR01SS25-110221-1	SW-846 6010D	Arsenic	J	FD
BPSOU-UR01SS19-110221-1	SW-846 7471B	Mercury	J	S%, D%

This resulted in 3 (1%) of the 364 natural laboratory data points that did not meet the precision requirements, and 361 (99%) of the 364 natural laboratory data points that did meet the precision requirements.

4.2 Accuracy

Accuracy is the ability of the analytical procedure to determine the actual or known quantity of a particular substance in a sample.

4.2.1 XRF Accuracy

For the XRF data, the SiO_2 standard and CCS are used to assess accuracy. The control limit for these samples is summarized in Attachment 3. If a SiO_2 standard or CCS result was outside the control limit, the natural sample results analyzed in the same run sequence were qualified.

If a SiO_2 standard had a detected result greater than the control limit, the natural sample results analyzed in the same analytical run were qualified "J+" if the natural sample result was a detected result less than 10 times the SiO_2 standard result.

All SiO_2 standard results were within control limits.

If the CCS result was outside the control limits summarized in Attachment 3, the natural sample results in the same analytical run as these CCS results were qualified as "J" for detected results or "UJ" for non-detected results.

All CCS analysis results were within the control limit.

For the XRF results, 486 (100%) of the 486 natural XRF data points did meet the accuracy requirements.

4.2.2 Laboratory Accuracy

For the laboratory data, MB, LCS, LCSD, LMS, and LMSD were used to assess accuracy. The QC criteria used during DV for each QC sample are summarized in Attachment 3.

Laboratory blanks were analyzed to assess artifacts introduced during analyses that may affect the accuracy of the data. In accordance with the CFRSSI QAPP (ARCO, 1992b), a data point is qualified as "U" if it is less than 5 times an associated blank result (MB) that does not meet the control limit.

The percent recoveries (%R) of the LCS, LCSD, LMS, and LMSD are used to measure accuracy. The LCS and LCSD measure sample preparation and analysis accuracy. The LMS and LMSD measure the effect that the sample matrix has on accuracy. Perfect %R would be 100% (the analysis result is exactly the known concentration of the spike amount in the LMS, LMSD, LCS or LCSD).

For the 2021 Site sampling event, qualifications were made to natural samples due to LMS and/or LMSD results from Pace exceeding control limits. These qualifications are detailed in the DV checklists for each SDG in Attachment 1.2. There were no qualifications made due to the remaining indicators of accuracy.

There were 9 natural data points qualified due to an exceedance of the %R for the LMS and/or LMSD (DV Reason Code = S%) as listed below:

Field Sample ID	Method	Analyte	DV Qualifier	DV Reason Code
BPSOU-UR01SS13-110221-1	SW-846 7471B	Mercury	J-	S%
BPSOU-UR01SS27-110221-3	SW-846 6010D	Lead	J-	S%
BPSOU-UR01SS27-110221-3	SW-846 6010D	Zinc	J-	S%
BPSOU-UR01SS27-110221-3	SW-846 7471B	Mercury	J-	S%
BPSOU-UR01SS19-110221-1	SW-846 6010D	Lead	J-	S%
BPSOU-UR01SS19-110221-1	SW-846 6010D	Zinc	J-	S%
BPSOU-UR01SS19-110221-1	SW-846 7471B	Mercury	J	S%, D%
BPSOU-UR01SS03-110321-1	SW-846 6010D	Zinc	J-	S%
BPSOU-UR01SS03-110321-1	SW-846 7471B	Mercury	UJ	Pres, S%

This resulted in 9 (2%) of the 364 natural laboratory data points that did not meet the accuracy requirements, and 355 (98%) of the 364 natural laboratory data points that did meet the accuracy requirements.

4.3 Representativeness

Representativeness is a qualitative parameter that is addressed through proper design of the sampling program. Samples for XRF analysis and laboratory analysis were collected in accordance with the QAPP and FSP.

The XRF and laboratory results were reviewed, and a Stage 2A DV completed. Based on information provided by Pace, the chain of custody requirements were met for the sample event. All samples were analyzed within the appropriate holding times. Fourteen natural laboratory data points were qualified due to not meeting the preservation requirement (<6ºC) for mercury (DV Reason Code = Pres) as listed below:

Field Sample ID	Method	Analyte	DV Qualifier	DV Reason Code
BPSOU-UR01SS03-110321-1	SW-846 7471B	Mercury	UJ	Pres, S%
BPSOU-UR01SS03-110321-2	SW-846 7471B	Mercury	UJ	Pres
BPSOU-UR01SS03-110321-3	SW-846 7471B	Mercury	UJ	Pres
BPSOU-UR01SS04-110321-1	SW-846 7471B	Mercury	UJ	Pres
BPSOU-UR01SS04-110321-2	SW-846 7471B	Mercury	UJ	Pres
BPSOU-UR01SS04-110321-3	SW-846 7471B	Mercury	UJ	Pres
BPSOU-UR01SS05-110321-1	SW-846 7471B	Mercury	J-	Pres
BPSOU-UR01SS05-110321-2	SW-846 7471B	Mercury	J-	Pres
BPSOU-UR01SS05-110321-3	SW-846 7471B	Mercury	J-	Pres
BPSOU-UR01SS06-110321-1	SW-846 7471B	Mercury	J-	Pres, <RL
BPSOU-UR01SS06-110321-2	SW-846 7471B	Mercury	J-	Pres
BPSOU-UR01SS07-110321-1	SW-846 7471B	Mercury	J-	Pres, <RL
BPSOU-UR01SS07-110321-2	SW-846 7471B	Mercury	UJ	Pres
BPSOU-UR01SS07-110321-3	SW-846 7471B	Mercury	UJ	Pres

These data points are considered usable with the recognition that the preservation requirement for mercury was not met. The representativeness goals were met.

4.4 Comparability

Comparability is assessed to determine if one set of data can be compared to another set of data. Comparisons are made by examining and comparing the laboratory and field methods used to acquire sample data for different distinct data sets. The data summarized in this report includes soil samples collected and analyzed by Pioneer and Pace.

4.4.1 XRF Comparability

The soil samples were collected using standard sampling methods and Pioneer SOPs. The sampling design, SOPs, and XRF methods are based on EPA and other industry standard practices and were documented in the field logbook. Sample collection was completed by professionals who were properly trained in using the SOPs and equipment. Proper sample handling was observed during sample collection and analysis.

Consequently, data from past and future soil sampling events at the Site using comparable sampling and XRF analysis may be used in concert with this data set.

4.4.2 Laboratory Comparability

The samples were collected using standard sampling methods and Pioneer SOPs. The sampling design, SOPs, and laboratory analytical methods are based on EPA and other industry standard practices and were documented in the field logbook. Sample collection was completed by professionals who were properly trained in using the SOPs and equipment. Proper chain of custody and sample handling were observed during sample collection, delivery to the laboratory, and analysis. The analytical laboratories performed the sample analysis using industry standard methods.

Consequently, data from past and future sampling events at the Site using comparable sampling and analytical methods may be used in concert with this data set.

4.5 Completeness

Completeness is assessed to determine if enough valid data have been collected to meet the investigation needs. Completeness is assessed by comparing the number of valid sample results to the number of sample results planned for the investigation. The completeness target for this investigation was 95% or greater as designated in the CFRSSI QAPP (ARCO, 1992b).

The completeness for XRF and laboratory samples and results are summarized below:

Analysis Type	Collected Samples vs Planned Samples	Valid Data Points vs Total Data Points
XRF	100%	100%
Laboratory	100%	100%

4.5.1 XRF Completeness

The QAPP and FSP include the planned soil sample locations and list the planned analytical techniques including XRF analysis.

Samples were collected at 27 sample locations during the 2021 Site sampling event. Sample station UR-01-SS-14 was not sampled due to third party ownership. An additional sample station, UR-01-OP-01, was sampled. The completeness for XRF data based on sample collection was 100%, and the completeness goal was met.

In total, 486 XRF data points were generated. All data points are considered usable because no results were rejected. The 81 XRF samples collected were analyzed by XRF for arsenic, cadmium, copper, lead, mercury, and zinc. Therefore, the completeness for XRF data based on sample analysis was 100% and the completeness goal was met.

4.5.2 Laboratory Completeness

The requirement for confirmation samples sent to the laboratory per the QAPP is at a rate of 1 per 10 natural XRF samples (10%), with additional samples sent to the laboratory for confirmation if the field results show the contaminant of concern (COC) levels at 35% above or 35% below established action/screening levels to limit decision errors.

For the 2021 Site sampling event, 52 of the 81 natural samples collected and analyzed by XRF were sent to Pace for analysis (64%). All natural samples collected with XRF results requiring confirmation were sent to Pace for analysis. The frequency requirement for the confirmation samples sent to the laboratory for analysis were met. Therefore, the completeness for laboratory samples based on sample collection was 100% and the completeness goal was met.

In total, 364 natural laboratory data points were generated by the sampling event. The 52 laboratory samples collected were analyzed for arsenic, cadmium, copper, lead, mercury, zinc, and percent moisture. All the natural data points were usable as no sample results were rejected. Therefore, the completeness for laboratory data based on sample analysis was 100%, and the completeness goal was met.

4.6 Sensitivity

Sensitivity is a quantitative measure and is evaluated by comparing the detection limit to the project-specific sensitivity requirements.

4.6.1 XRF Sensitivity

The non-detected XRF results were reported as less than the LOD associated with each result.

The QAPP does not specify sensitivity requirements for XRF analyses; therefore, the action/screening levels in the QAPP were used to evaluate sensitivity for each analyte. The QAPP specified that samples must be sent to the laboratory for confirmation if the field results show the COC levels at 35% above or 35% below established action/screening levels to limit decision errors. Therefore, a value of 35% below the BPSOU Soil Screening Criteria for Storm Water COCs listed on Table 2 of the QAPP were used to evaluate sensitivity because they are less than the BPSOU Soil Action Level for Human Health listed in Table 1 of the QAPP. The required detection limit for XRF results is summarized below:

Analyte	Criteria	Units	Action/Screening Level	35% below
Arsenic	Storm Water	mg/kg	200	130
Cadmium	Storm Water	mg/kg	20	13
Copper	Storm Water	mg/kg	1,000	650
Lead	Storm Water	mg/kg	1,000	650
Mercury	Storm Water	mg/kg	10	6.5
Zinc	Storm Water	mg/kg	1,000	650

mg/kg: milligrams per kilogram.

The detection limit for the non-detected XRF results was less than 35% below the minimum action/screening level for each analyte except for the following results:

Laboratory Sample ID	Field Sample ID	Method	Analyte	Units	Result (<LOD)
P_20211102_98052_151	BPSOU-UR01SS25-110221-2	XRF	Mercury	mg/kg	<6.58
P_20211102_98052_155	BPSOU-UR01SS27-110221-3	XRF	Mercury	mg/kg	<6.61
P_20211102_98052_156	BPSOU-UR01SS23-110221-1	XRF	Mercury	mg/kg	<7.28
P_20211102_98052_157	BPSOU-UR01SS23-110221-2	XRF	Mercury	mg/kg	<8.15
P_20211102_98052_158	BPSOU-UR01SS23-110221-3	XRF	Mercury	mg/kg	<7.77
P_20211102_98052_160	BPSOU-UR01SS26-110221-2	XRF	Mercury	mg/kg	<6.83
P_20211102_98052_161	BPSOU-UR01SS26-110221-3	XRF	Mercury	mg/kg	<6.81
P_20211102_98052_165	BPSOU-UR01SS21-110221-1	XRF	Mercury	mg/kg	<7.2
P_20211102_98052_166	BPSOU-UR01SS21-110221-2	XRF	Mercury	mg/kg	<6.67
P_20211102_98052_167	BPSOU-UR01SS21-110221-3	XRF	Mercury	mg/kg	<7.08
P_20211103_98052_188	BPSOU-UR01SS22-110221-2	XRF	Mercury	mg/kg	<6.79
P_20211103_98052_193	BPSOU-UR01SS19-110221-1	XRF	Mercury	mg/kg	<7.01
P_20211103_98052_194	BPSOU-UR01SS19-110221-2	XRF	Mercury	mg/kg	<7.8
P_20211103_98052_195	BPSOU-UR01SS19-110221-3	XRF	Mercury	mg/kg	<8.57
P_20211103_98052_196	BPSOU-UR01SS18-110221-1	XRF	Mercury	mg/kg	<6.63
P_20211103_98052_197	BPSOU-UR01SS18-110221-2	XRF	Mercury	mg/kg	<6.78
P_20211103_98052_198	BPSOU-UR01SS18-110221-3	XRF	Mercury	mg/kg	<7.06
P_20211103_98052_203	BPSOU-UR01SS16-110221-2	XRF	Mercury	mg/kg	<6.9
P_20211103_98052_204	BPSOU-UR01SS16-110221-3	XRF	Mercury	mg/kg	<6.96
P_20211103_98052_205	BPSOU-UR01SS15-110221-1	XRF	Mercury	mg/kg	<6.67
P_20211103_98052_206	BPSOU-UR01SS15-110221-2	XRF	Mercury	mg/kg	<6.95
P_20211103_98052_214	BPSOU-UR01SS15-110221-3	XRF	Mercury	mg/kg	<6.88
P_20211103_98052_218	BPSOU-UR01SS08-110221-1	XRF	Mercury	mg/kg	<6.81

Laboratory Sample ID	Field Sample ID	Method	Analyte	Units	Result (<LOD)
P_20211103_98052_219	BPSOU-UR01SS08-110221-2	XRF	Mercury	mg/kg	<6.93
P_20211103_98052_220	BPSOU-UR01SS08-110221-3	XRF	Mercury	mg/kg	<8.86
P_20211103_98052_225	BPSOU-UR01SS11-110221-2	XRF	Mercury	mg/kg	<7.11
P_20211103_98052_226	BPSOU-UR01SS11-110221-3	XRF	Mercury	mg/kg	<7.11
P_20211103_98052_228	BPSOU-UR01SS10-110221-2	XRF	Mercury	mg/kg	<6.61
P_20211103_98052_229	BPSOU-UR01SS10-110221-3	XRF	Mercury	mg/kg	<6.57
P_20211103_98052_230	BPSOU-UR01SS13-110221-1	XRF	Mercury	mg/kg	<7.93
P_20211103_98052_231	BPSOU-UR01SS13-110221-2	XRF	Mercury	mg/kg	<7.23
P_20211103_98052_232	BPSOU-UR01SS13-110221-3	XRF	Mercury	mg/kg	<6.51
P_20211103_98052_241	BPSOU-UR01SS12-110221-2	XRF	Mercury	mg/kg	<6.81
P_20211103_98052_244	BPSOU-UR01SS01-110321-2	XRF	Mercury	mg/kg	<6.78
P_20211103_98052_245	BPSOU-UR01SS01-110321-3	XRF	Mercury	mg/kg	<7.09
P_20211103_98052_248	BPSOU-UR01SS02-110321-2	XRF	Mercury	mg/kg	<7.26
P_20211103_98052_251	BPSOU-UR01SS03-110321-1	XRF	Mercury	mg/kg	<6.91
P_20211103_98052_252	BPSOU-UR01SS03-110321-2	XRF	Mercury	mg/kg	<6.89
P_20211103_98052_253	BPSOU-UR01SS03-110321-3	XRF	Mercury	mg/kg	<6.81
P_20211103_98052_254	BPSOU-UR01SS04-110321-1	XRF	Mercury	mg/kg	<7.48
P_20211103_98052_255	BPSOU-UR01SS04-110321-2	XRF	Mercury	mg/kg	<6.73
P_20211103_98052_256	BPSOU-UR01SS04-110321-3	XRF	Mercury	mg/kg	<6.96
P_20211103_98052_257	BPSOU-UR01SS05-110321-1	XRF	Mercury	mg/kg	<6.69
P_20211103_98052_258	BPSOU-UR01SS05-110321-2	XRF	Mercury	mg/kg	<7.21
P_20211103_98052_266	BPSOU-UR01SS05-110321-3	XRF	Mercury	mg/kg	<7.21
P_20211103_98052_267	BPSOU-UR01SS07-110321-1	XRF	Mercury	mg/kg	<6.55
P_20211103_98052_269	BPSOU-UR01SS07-110321-2	XRF	Mercury	mg/kg	<7.24
P_20211103_98052_270	BPSOU-UR01SS07-110321-3	XRF	Mercury	mg/kg	<6.87
P_20211103_98052_271	BPSOU-UR01SS06-110321-1	XRF	Mercury	mg/kg	<6.64
P_20211103_98052_273	BPSOU-UR01SS06-110321-2	XRF	Mercury	mg/kg	<7.69

mg/kg: milligrams per kilogram. LOD: limit of detection.

These data points are considered usable with the recognition that the LOD for the non-detected results is higher than 35% below the lowest action/screening level.

4.6.2 Laboratory Sensitivity

The non-detected laboratory results from Pace were reported as less than the adjusted MDLs for each sample.

To evaluate sensitivity, the proposed MDLs and RLs listed in Table 3 of the QAPP for arsenic, cadmium, copper, lead, zinc, and mercury were compared to the adjusted MDL for non-detected results.

The adjusted MDL for the non-detected laboratory results were less than proposed MDLs in the QAPP except for the following results:

Laboratory Sample ID	Field Sample ID	Method	Analyte	Dilution Factor	Units	Result (<MDL)	QAPP MDL	QAPP RL
10587272001	BPSOU-UR01SS03-110321-1	SW-846 7471B	Mercury	1	mg/kg	<0.01	0.00931	0.02

The adjusted MDL for this non-detect mercury result was greater than the proposed MDL; however, it was less than the proposed RL. The usability of the data is not affected by this instance of the laboratory MDL not meeting the QAPP MDLs.

4.7 Overall Data Summary

The following list shows an overall summary of the validation performed on the data generated by Pioneer for the samples collected during the 2021 Site sampling event.

Analysis Type	Total Natural		Level A/B	DV Qual J, J+, J-, or UJ	DV Qual R	DV Qual U or A	Enforcement Quality	Screening Quality	Rejected
	Samples	Data Points	A/B	Data Points	Data Points	Data Points	Data Points (% of total)	Data Points (% of Total)	Data Points (% of Total)
XRF	81	486	B	85	0	0	401 (83%)	85 (17%)	0 (0%)
Pace	52	364	B	24	0	14	340 (93%)	24 (7%)	0 (0%)

5.0 REFERENCES

AERL, 2000. Clark Fork River Superfund Site Investigations (CFRSSI) Data Management/Data Validation (DM/DV) Plan Addendum. Prepared for ARCO by Exponent, Lake Oswego, Oregon. June 2000.

ARCO, 1992a. Clark Fork River Superfund Site Investigations Data Management/Data Validation Plan, Atlantic Richfield Company, 1992.

ARCO, 1992b. Clark Fork River Superfund Site Investigation, Quality Assurance Project Plan, Atlantic Richfield Company, 1992.

Atlantic Richfield Company, 2021a. Final Butte Priority Soils Operable Unit (BPSOU) Unreclaimed Sites Field Sampling Plan (FSP) Package #7: UR-01, UR-12, UR-03, UR-04, UR-15, and UR-17. October 2021.

Atlantic Richfield Company, 2021b. Final Unreclaimed Sites Quality Assurance Project Plan. June 2021.

EPA, 2009. Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use. U.S. Environmental Protection Agency, January 2009.

EPA, 2020. U.S. Environmental Protection Agency National Functional Guidelines for Inorganic Superfund Data Review, November 2020.

ThermoFisher Scientific, 2014. Niton XL3 Mining QC Sheet, Document: 140-00072, March 2014.

TABLES

Table A1. Natural Sample Results with Laboratory Qualifiers; Data Validation Qualifiers; Enforcement, Screening, and Rejected Classifications; and Data Validation Reason Codes

Station (Depth Interval)			UR-01-OP-01(0-2)					UR-01-OP-01(2-6)					UR-01-OP-01(6-12)					UR-01-SS-01(0-2)					UR-01-SS-01(2-6)					UR-01-SS-01(6-12)					UR-01-SS-02(0-2)				
Field Sample ID			BPSOU-UR01OP01-110221-1					BPSOU-UR01OP01-110221-2					BPSOU-UR01OP01-110221-3					BPSOU-UR01SS01-110321-1					BPSOU-UR01SS01-110321-2					BPSOU-UR01SS01-110321-3					BPSOU-UR01SS02-110321-1				
Lab Sample ID			N/A					N/A					N/A					N/A					10586277012					10586277013					N/A				
Sample Date			11/2/2021					11/2/2021					11/2/2021					11/3/2021					11/3/2021					11/3/2021					11/3/2021				
Sample Type			Natural					Natural					Natural					Natural					Natural					Natural					Natural				
Method	Analyte	Units	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code
XRF	Arsenic	mg/kg	10.69			E		14.27			E		12.69			E		<7.4	<LOD		E		10.58			E		9.86			E		8.09			E	
XRF	Cadmium	mg/kg	<6.95	<LOD		E		<6.99	<LOD		E		<7.07	<LOD		E		<7.4	<LOD		E		<7.59	<LOD		E		<7.88	<LOD		E		<7.44	<LOD		E	
XRF	Copper	mg/kg	46.72			E		26.06			E		43.00			E		70.86			E		50.41			E		79.01			E		79.07			E	
XRF	Lead	mg/kg	12.97			E		11.88			E		19.53			E		48.95			E		30.97			E		26.26			E		14.14			E	
XRF	Mercury	mg/kg	<5.87	<LOD	UJ	S	CX	<6.18	<LOD	UJ	S	CX	<6.12	<LOD	UJ	S	CX	<6.38	<LOD	UJ	S	CX	<6.78	<LOD	UJ	S	CX	<7.09	<LOD	UJ	S	CX	<6.47	<LOD	UJ	S	CX
XRF	Zinc	mg/kg	74.51			E		73.98			E		77.1			E		130.86			E		138.68			E		187.34			E		102.78			E	
ASTM D2974	Moisture, Percent	%																					5.0	N2		E		3.7	N2		E						
SW-846 6010D	Arsenic	mg/kg																					4.7			E		3.4			E						
SW-846 6010D	Cadmium	mg/kg																					0.19			E		0.16			E						
SW-846 6010D	Copper	mg/kg																					40.1			E		42.1			E						
SW-846 6010D	Lead	mg/kg																					22.7			E		24.7			E						
SW-846 6010D	Zinc	mg/kg																					70.3			E		75.5			E						
SW-846 7471B	Mercury	mg/kg																					<0.0081	U		E		0.0098	J	A	E	<RL					

Notes:
Depth intervals are inches below ground surface.

Qualification (Qual) and Reason Codes are
defined in Table A4.

< - Not detected at the detection limit.

Abbreviations:
mg/kg - milligram per kilogram

Table A1. Natural Sample Results with Laboratory Qualifiers; Data Validation Qualifiers; Enforcement, Screening, and Rejected Classifications; and Data Validation Reason Codes

Station (Depth Interval)			UR-01-SS-02(2-6)					UR-01-SS-02(6-12)					UR-01-SS-03(0-2)					UR-01-SS-03(2-6)					UR-01-SS-03(6-12)					UR-01-SS-04(0-2)					UR-01-SS-04(2-6)				
Field Sample ID			BPSOU-UR01SS02-110321-2					BPSOU-UR01SS02-110321-3					BPSOU-UR01SS03-110321-1					BPSOU-UR01SS03-110321-2					BPSOU-UR01SS03-110321-3					BPSOU-UR01SS04-110321-1					BPSOU-UR01SS04-110321-2				
Lab Sample ID			10586396012					N/A					10587272001					10587272002					10587272003					10587272004					10587272005				
Sample Date			11/3/2021					11/3/2021					11/3/2021					11/3/2021					11/3/2021					11/3/2021					11/3/2021				
Sample Type			Natural					Natural					Natural					Natural					Natural					Natural					Natural				
Method	Analyte	Units	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code
XRF	Arsenic	mg/kg	<5.5	<LOD		E		<5.5	<LOD		E		10.51			E		6.62			E		7.66			E		<6.35	<LOD		E		10.43			E	
XRF	Cadmium	mg/kg	10.89			E		<7.62	<LOD		E		<7.71	<LOD		E		<7.73	<LOD		E		<7.83	<LOD		E		<7.58	<LOD		E		<7.89	<LOD		E	
XRF	Copper	mg/kg	55.18			E		67.44			E		107.65			E		73.47			E		81.10			E		77.83			E		85.53			E	
XRF	Lead	mg/kg	13.06			E		17.77			E		13.88			E		21.28			E		26.12			E		22.86			E		16.84			E	
XRF	Mercury	mg/kg	<7.26	<LOD	UJ	S	CX	<6.45	<LOD	UJ	S	CX	<6.91	<LOD	UJ	S	CX	<6.89	<LOD	UJ	S	CX	<6.81	<LOD	UJ	S	CX	<7.48	<LOD	UJ	S	CX	<6.73	<LOD	UJ	S	CX
XRF	Zinc	mg/kg	101.97			E		123.52			E		135.54			E		165.35			E		153.01			E		182.68			E		120.67			E	
ASTM D2974	Moisture, Percent	%	4.6	N2		E							26.2	N2		E		15.4	N2		E		15.2	N2		E		7.9	N2		E		6.5	N2		E	
SW-846 6010D	Arsenic	mg/kg	2.4			E							3.7			E		9.2			E		2.3			E		2.8			E		3.0			E	
SW-846 6010D	Cadmium	mg/kg	0.11	J	A	E	<RL						0.23			E		0.24			E		0.18			E		0.18			E		0.13	J	A	E	<RL
SW-846 6010D	Copper	mg/kg	41.5			E							68.6			E		63.1			E		39.5			E		49.7			E		61.4			E	
SW-846 6010D	Lead	mg/kg	6.1		J	S	FD						13.8			E		10.7			E		8.3			E		16.9			E		13.5			E	
SW-846 6010D	Zinc	mg/kg	46.1			E							71.7	M1	J-	S	S%	92.0			E		65.7			E		73.6			E		59.0			E	
SW-846 7471B	Mercury	mg/kg	0.010	J	A	E	<RL						<0.01	U,M1	UJ	S	Pres, S%	<0.0088	U	UJ	S	Pres	<0.0088	U	UJ	S	Pres	<0.0088	U	UJ	S	Pres	<0.0084	U	UJ	S	Pres

Notes:
Depth intervals are inches below ground surface.

Qualification (Qual) and Reason Codes are
defined in Table A4.

< - Not detected at the detection limit.

Abbreviations:
mg/kg - milligram per kilogram

Table A1. Natural Sample Results with Laboratory Qualifiers; Data Validation Qualifiers; Enforcement, Screening, and Rejected Classifications; and Data Validation Reason Codes

Station (Depth Interval)			UR-01-SS-04(6-12)					UR-01-SS-05(0-2)					UR-01-SS-05(2-6)					UR-01-SS-05(6-12)					UR-01-SS-06(0-2)					UR-01-SS-06(2-6)					UR-01-SS-06(6-12)				
Field Sample ID			BPSOU-UR01SS04-110321-3					BPSOU-UR01SS05-110321-1					BPSOU-UR01SS05-110321-2					BPSOU-UR01SS05-110321-3					BPSOU-UR01SS06-110321-1					BPSOU-UR01SS06-110321-2					BPSOU-UR01SS06-110321-3				
Lab Sample ID			10587272006					10587272007					10587272008					10587272009					10587272010					10587272012					N/A				
Sample Date			11/3/2021					11/3/2021					11/3/2021					11/3/2021					11/3/2021					11/3/2021					11/3/2021				
Sample Type			Natural					Natural					Natural					Natural					Natural					Natural					Natural				
Method	Analyte	Units	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code
XRF	Arsenic	mg/kg	6.06			E		15.77			E		<14.42	<LOD		E		13.15			E		8.01			E		7.51			E		<5.84	<LOD		E	
XRF	Cadmium	mg/kg	8.48			E		<7.52	<LOD		E		<7.84	<LOD		E		<7.64	<LOD		E		<7.31	<LOD		E		<8.13	<LOD		E		<7.74	<LOD		E	
XRF	Copper	mg/kg	62.84			E		74.76			E		78.79			E		82.37			E		65.65			E		50.27			E		66.72			E	
XRF	Lead	mg/kg	11.53			E		44.23			E		211.17		J	S	D%, R%	60.60			E		15.37			E		13.98			E		21.19			E	
XRF	Mercury	mg/kg	<6.96	<LOD	UJ	S	CX	<6.69	<LOD	UJ	S	CX	<7.21	<LOD	UJ	S	CX	<7.21	<LOD	UJ	S	CX	<6.64	<LOD	UJ	S	CX	<7.69	<LOD	UJ	S	CX	<6.45	<LOD	UJ	S	CX
XRF	Zinc	mg/kg	114.34			E		225.69			E		287.40			E		276.32			E		108.76			E		110.24			E		112.25			E	
ASTM D2974	Moisture, Percent	%	6.9	N2		E		8.8	N2		E		5.1	N2		E		18.4	N2		E		7.1	N2		E		5.4	N2		E						
SW-846 6010D	Arsenic	mg/kg	1.7			E		5.2			E		4.3			E		4.4			E		3.2			E		3.4			E						
SW-846 6010D	Cadmium	mg/kg	0.065	J	A	E	<RL	0.56			E		0.40			E		0.52			E		0.14	J	A	E	<RL	0.18			E						
SW-846 6010D	Copper	mg/kg	35.9			E		41.8			E		42.1			E		37.8			E		40.0			E		38.2			E						
SW-846 6010D	Lead	mg/kg	3.9			E		56.2			E		58.7			E		40.6			E		22.4			E		9.1			E						
SW-846 6010D	Zinc	mg/kg	42.8			E		158			E		152			E		141			E		53.5			E		49.9			E						
SW-846 7471B	Mercury	mg/kg	<0.009	U	UJ	S	Pres	0.24		J-	S	Pres	0.35		J-	S	Pres	0.84		J-	S	Pres	0.016	J	J-	S	Pres, <RL	0.022		J-	S	Pres					

Notes:
Depth intervals are inches below ground surface.

Qualification (Qual) and Reason Codes are
defined in Table A4.

< - Not detected at the detection limit.

Abbreviations:
mg/kg - milligram per kilogram

Table A1. Natural Sample Results with Laboratory Qualifiers; Data Validation Qualifiers; Enforcement, Screening, and Rejected Classifications; and Data Validation Reason Codes

Station (Depth Interval)			UR-01-SS-07(0-2)					UR-01-SS-07(2-6)					UR-01-SS-07(6-12)					UR-01-SS-08(0-2)					UR-01-SS-08(2-6)					UR-01-SS-08(6-12)				
Field Sample ID			BPSOU-UR01SS07-110321-1					BPSOU-UR01SS07-110321-2					BPSOU-UR01SS07-110321-3					BPSOU-UR01SS08-110221-1					BPSOU-UR01SS08-110221-2					BPSOU-UR01SS08-110221-3				
Lab Sample ID			10587272013					10587272014					10587273014					10586396009					10586396010					10586396011				
Sample Date			11/3/2021					11/3/2021					11/3/2021					11/2/2021					11/2/2021					11/2/2021				
Sample Type			Natural					Natural					Natural					Natural					Natural					Natural				
Method	Analyte	Units	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code
XRF	Arsenic	mg/kg	7.57			E		6.36			E		7.30			E		10.37			E		9.96			E		<7.41	<LOD		E	
XRF	Cadmium	mg/kg	<7.5	<LOD		E		<7.85	<LOD		E		9.19			E		<7.46	<LOD		E		<7.76	<LOD		E		9.53			E	
XRF	Copper	mg/kg	63.66			E		55.93			E		58.12			E		76.26			E		63.45			E		31.49			E	
XRF	Lead	mg/kg	17.71		J	S	FD	9.67			E		17.27			E		19.95			E		24.03			E		28.02			E	
XRF	Mercury	mg/kg	<6.55	<LOD	UJ	S	CX	<7.24	<LOD	UJ	S	CX	<6.87	<LOD	UJ	S	CX	<6.81	<LOD	UJ	S	CX	<6.93	<LOD	UJ	S	CX	<8.86	<LOD	UJ	S	CX
XRF	Zinc	mg/kg	123.77			E		100.93			E		112.12			E		120.96			E		113.87			E		101.85			E	
ASTM D2974	Moisture, Percent	%	5.1	N2		E		3.7	N2		E		7.6	N2		E		12.0	N2		E		4.6	N2		E		10.7	N2		E	
SW-846 6010D	Arsenic	mg/kg	2.0			E		1.5			E		2.3			E		3.5			E		4.2			E		4.1			E	
SW-846 6010D	Cadmium	mg/kg	0.17			E		0.18			E		0.093	J		E		0.12	J	A	E	<RL	0.14	J	A	E	<RL	0.40			E	
SW-846 6010D	Copper	mg/kg	31.2			E		29.5			E		25.9			E		41.7			E		32.6			E		40.1			E	
SW-846 6010D	Lead	mg/kg	9.2			E		5.8			E		4.3			E		18.9			E		11.7			E		12.1			E	
SW-846 6010D	Zinc	mg/kg	55.5			E		46.6			E		38.6			E		58.9			E		51.6			E		73.9			E	
SW-846 7471B	Mercury	mg/kg	0.013	J	J-	S	Pres, <RL	<0.0084	U	UJ	S	Pres	<0.0083	U	UJ	S	Pres	0.019			E		0.025			E		0.012	J	A	E	<RL

Notes:
Depth intervals are inches below ground surface.

Qualification (Qual) and Reason Codes are
defined in Table A4.

< - Not detected at the detection limit.

Abbreviations:
mg/kg - milligram per kilogram

Table A1. Natural Sample Results with Laboratory Qualifiers; Data Validation Qualifiers; Enforcement, Screening, and Rejected Classifications; and Data Validation Reason Codes

Station (Depth Interval)			UR-01-SS-09(0-2)					UR-01-SS-09(2-6)					UR-01-SS-09(6-12)					UR-01-SS-10(0-2)					UR-01-SS-10(2-6)					UR-01-SS-10(6-12)					UR-01-SS-11(0-2)				
Field Sample ID			BPSOU-UR01SS09-110221-1					BPSOU-UR01SS09-110221-2					BPSOU-UR01SS09-110221-3					BPSOU-UR01SS10-110221-1					BPSOU-UR01SS10-110221-2					BPSOU-UR01SS10-110221-3					BPSOU-UR01SS11-110221-1				
Lab Sample ID			N/A					N/A					N/A					N/A					10586396007					10586396008					N/A				
Sample Date			11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021				
Sample Type			Natural					Natural					Natural					Natural					Natural					Natural					Natural				
Method	Analyte	Units	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code
XRF	Arsenic	mg/kg	24.89			E		29.83			E		29.36			E		14.41			E		13.61			E		11.09			E		8.99			E	
XRF	Cadmium	mg/kg	<6.42	<LOD		E		<6.78	<LOD		E		<6.69	<LOD		E		<7.13	<LOD		E		<7.12	<LOD		E		<6.78	<LOD		E		7.85			E	
XRF	Copper	mg/kg	52.70			E		48.40			E		55.84			E		86.66			E		131.60			E		205.84			E		60.55			E	
XRF	Lead	mg/kg	21.03			E		18.79			E		18.03			E		25.39			E		28.89			E		46.71			E		25.68			E	
XRF	Mercury	mg/kg	<5.87	<LOD	UJ	S	CX	<6.01	<LOD	UJ	S	CX	<5.91	<LOD	UJ	S	CX	<6.34	<LOD	UJ	S	CX	<6.61	<LOD	UJ	S	CX	<6.57	<LOD	UJ	S	CX	<6.46	<LOD	UJ	S	CX
XRF	Zinc	mg/kg	100.42			E		98.24			E		102.58			E		129.66			E		172.46			E		301.58			E		156.74			E	
ASTM D2974	Moisture, Percent	%																					3.8	N2		E		16.1	N2		E						
SW-846 6010D	Arsenic	mg/kg																					4.9			E		4.3			E						
SW-846 6010D	Cadmium	mg/kg																					0.33			E		0.43			E						
SW-846 6010D	Copper	mg/kg																					47.4			E		64.8			E						
SW-846 6010D	Lead	mg/kg																					15.0			E		17.7			E						
SW-846 6010D	Zinc	mg/kg																					78.5			E		110			E						
SW-846 7471B	Mercury	mg/kg																					0.23			E		0.55			E						

Notes:
Depth intervals are inches below ground surface.

Qualification (Qual) and Reason Codes are
defined in Table A4.

< - Not detected at the detection limit.

Abbreviations:
mg/kg - milligram per kilogram

Table A1. Natural Sample Results with Laboratory Qualifiers; Data Validation Qualifiers; Enforcement, Screening, and Rejected Classifications; and Data Validation Reason Codes

Station (Depth Interval)			UR-01-SS-11(2-6)					UR-01-SS-11(6-12)					UR-01-SS-12(0-2)					UR-01-SS-12(2-6)					UR-01-SS-12(6-12)					UR-01-SS-13(0-2)					UR-01-SS-13(2-6)				
Field Sample ID			BPSOU-UR01SS11-110221-2					BPSOU-UR01SS11-110221-3					BPSOU-UR01SS12-110221-1					BPSOU-UR01SS12-110221-2					BPSOU-UR01SS12-110221-3					BPSOU-UR01SS13-110221-1					BPSOU-UR01SS13-110221-2				
Lab Sample ID			10586396005					10586396006					N/A					10586396004					N/A					10586396001					10586396002				
Sample Date			11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021				
Sample Type			Natural					Natural					Natural					Natural					Natural					Natural					Natural				
Method	Analyte	Units	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code
XRF	Arsenic	mg/kg	10.55			E		18.42			E		10.39			E		18.87			E		6.06			E		11.47			E		<7.23	<LOD		E	
XRF	Cadmium	mg/kg	10.45			E		<7.76	<LOD		E		<7.65	<LOD		E		<7.68	<LOD		E		8.09			E		11.00			E		12.70			E	
XRF	Copper	mg/kg	49.91			E		100.03			E		63.55			E		37.83			E		74.75			E		49.11			E		57.81			E	
XRF	Lead	mg/kg	17.07			E		95.70			E		58.44			E		18.30			E		18.19			E		22.52			E		36.74			E	
XRF	Mercury	mg/kg	<7.11	<LOD	UJ	S	CX	<7.11	<LOD	UJ	S	CX	<6.44	<LOD	UJ	S	CX	<6.81	<LOD	UJ	S	CX	<6.25	<LOD	UJ	S	CX	<7.93	<LOD	UJ	S	CX	<7.23	<LOD	UJ	S	CX
XRF	Zinc	mg/kg	161.57			E		274.76			E		157.57			E		145.94			E		193.16			E		128.92			E		129.28			E	
ASTM D2974	Moisture, Percent	%	3.5	N2		E		3.3	N2		E							19.8	N2		E							7.4	N2		E		6.2	N2		E	
SW-846 6010D	Arsenic	mg/kg	4.7			E		7.3			E							18.0			E							9.4			E		4.9			E	
SW-846 6010D	Cadmium	mg/kg	0.26			E		0.58			E							0.30			E							0.30			E		0.14	J	A	E	<RL
SW-846 6010D	Copper	mg/kg	44.6			E		61.8			E							35.0			E							59.2			E		48.8			E	
SW-846 6010D	Lead	mg/kg	26.7			E		88.7			E							20.6			E							25.5			E		12.1			E	
SW-846 6010D	Zinc	mg/kg	83.1			E		167			E							144			E							113			E		78.3			E	
SW-846 7471B	Mercury	mg/kg	0.020			E		0.097			E							0.014	J	A	E	<RL						0.032	M1	J-	S	S%	0.010	J	A	E	<RL

Notes:
Depth intervals are inches below ground surface.

Qualification (Qual) and Reason Codes are
defined in Table A4.

< - Not detected at the detection limit.

Abbreviations:
mg/kg - milligram per kilogram

Table A1. Natural Sample Results with Laboratory Qualifiers; Data Validation Qualifiers; Enforcement, Screening, and Rejected Classifications; and Data Validation Reason Codes

Station (Depth Interval)			UR-01-SS-13(6-12)					UR-01-SS-15(0-2)					UR-01-SS-15(2-6)					UR-01-SS-15(6-12)					UR-01-SS-16(0-2)					UR-01-SS-16(2-6)					UR-01-SS-16(6-12)				
Field Sample ID			BPSOU-UR01SS13-110221-3					BPSOU-UR01SS15-110221-1					BPSOU-UR01SS15-110221-2					BPSOU-UR01SS15-110221-3					BPSOU-UR01SS16-110221-1					BPSOU-UR01SS16-110221-2					BPSOU-UR01SS16-110221-3				
Lab Sample ID			10586396003					10586277009					10586277010					10586277011					N/A					10586277007					10586277008				
Sample Date			11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021				
Sample Type			Natural					Natural					Natural					Natural					Natural					Natural					Natural				
Method	Analyte	Units	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code
XRF	Arsenic	mg/kg	12.29		J	S	D%, R%	23.97			E		17.05			E		10.20			E		30.77			E		23.77			E		20.82			E	
XRF	Cadmium	mg/kg	9.41			E		7.58			E		10.24			E		12.87			E		<6.79	<LOD		E		<7.19	<LOD		E		<7.3	<LOD		E	
XRF	Copper	mg/kg	74.15			E		101.97			E		103.46			E		91.28			E		52.56			E		84.12			E		106.88			E	
XRF	Lead	mg/kg	17.39			E		361.91			E		157.75		J	S	D%	47.54			E		25.88			E		71.65			E		86.25			E	
XRF	Mercury	mg/kg	<6.51	<LOD	UJ	S	CX	<6.67	<LOD	UJ	S	CX	<6.95	<LOD	UJ	S	CX	<6.88	<LOD	UJ	S	CX	<5.9	<LOD	UJ	S	CX	<6.9	<LOD	UJ	S	CX	<6.96	<LOD	UJ	S	CX
XRF	Zinc	mg/kg	132.37			E		502.20			E		360.53			E		297.98			E		107.03			E		253.47			E		295.75			E	
ASTM D2974	Moisture, Percent	%	6.3	N2		E		6.2	N2		E		5.0	N2		E		4.2	N2		E							4.2	N2		E		3.5	N2		E	
SW-846 6010D	Arsenic	mg/kg	2.7			E		8.1			E		12.2			E		8.1			E							11.8			E		6			E	
SW-846 6010D	Cadmium	mg/kg	0.24			E		0.53			E		1.7			E		0.90			E							0.55			E		0.46			E	
SW-846 6010D	Copper	mg/kg	45.9			E		73.2			E		71.4			E		82.0			E							46.7			E		58.9			E	
SW-846 6010D	Lead	mg/kg	7.8			E		75.5			E		200			E		195			E							43.5			E		55.4			E	
SW-846 6010D	Zinc	mg/kg	79.3			E		168			E		315			E		243			E							134			E		138			E	
SW-846 7471B	Mercury	mg/kg	0.012	J	A	E	<RL	0.61			E		0.23			E		0.15			E							0.11			E		0.21			E	

Notes:
Depth intervals are inches below ground surface.

Qualification (Qual) and Reason Codes are
defined in Table A4.

< - Not detected at the detection limit.

Abbreviations:
mg/kg - milligram per kilogram

Table A1. Natural Sample Results with Laboratory Qualifiers; Data Validation Qualifiers; Enforcement, Screening, and Rejected Classifications; and Data Validation Reason Codes

Station (Depth Interval)			UR-01-SS-17(0-2)					UR-01-SS-17(2-6)					UR-01-SS-17(6-12)					UR-01-SS-18(0-2)					UR-01-SS-18(2-6)					UR-01-SS-18(6-12)					UR-01-SS-19(0-2)				
Field Sample ID			BPSOU-UR01SS17-110221-1					BPSOU-UR01SS17-110221-2					BPSOU-UR01SS17-110221-3					BPSOU-UR01SS18-110221-1					BPSOU-UR01SS18-110221-2					BPSOU-UR01SS18-110221-3					BPSOU-UR01SS19-110221-1				
Lab Sample ID			N/A					N/A					N/A					10586277004					10586277005					10586277006					10586277001				
Sample Date			11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021				
Sample Type			Natural					Natural					Natural					Natural					Natural					Natural					Natural				
Method	Analyte	Units	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code
XRF	Arsenic	mg/kg	30.07			E		32.63			E		29.55			E		11.80			E		12.29			E		8.71			E		8.80			E	
XRF	Cadmium	mg/kg	<7	<LOD		E		<6.83	<LOD		E		<6.94	<LOD		E		<7.24	<LOD		E		<7.63	<LOD		E		<7.69	<LOD		E		<7.6	<LOD		E	
XRF	Copper	mg/kg	48.64			E		56.75			E		44.34			E		58.96			E		69.63			E		62.46			E		71.01			E	
XRF	Lead	mg/kg	23.32			E		23.21			E		24.04			E		63.03			E		34.61			E		39.53			E		60.56			E	
XRF	Mercury	mg/kg	<6.1	<LOD	UJ	S	CX	<6.14	<LOD	UJ	S	CX	<6.27	<LOD	UJ	S	CX	<6.63	<LOD	UJ	S	CX	<6.78	<LOD	UJ	S	CX	<7.06	<LOD	UJ	S	CX	<7.01	<LOD	UJ	S	CX
XRF	Zinc	mg/kg	103.74			E		97.97			E		94.33			E		227.03			E		162.58			E		138.98			E		195.93			E	
ASTM D2974	Moisture, Percent	%																6.5	N2		E		4.3	N2		E		4.0	N2		E		5.2	N2		E	
SW-846 6010D	Arsenic	mg/kg																7.2			E		5.1			E		5.0			E		5.0			E	
SW-846 6010D	Cadmium	mg/kg																0.66			E		0.21			E		0.24			E		0.33			E	
SW-846 6010D	Copper	mg/kg																54.7			E		39.4			E		39.4			E		49.9			E	
SW-846 6010D	Lead	mg/kg																80.7			E		26.5			E		23.8			E		39.4	M1	J-	S	S%
SW-846 6010D	Zinc	mg/kg																200			E		79.4			E		76.3			E		114	M1	J-	S	S%
SW-846 7471B	Mercury	mg/kg																0.12			E		0.11			E		0.082			E		0.051	R1,M1	J	S	S%, D%

Notes:
Depth intervals are inches below ground surface.

Qualification (Qual) and Reason Codes are
defined in Table A4.

< - Not detected at the detection limit.

Abbreviations:
mg/kg - milligram per kilogram

Table A1. Natural Sample Results with Laboratory Qualifiers; Data Validation Qualifiers; Enforcement, Screening, and Rejected Classifications; and Data Validation Reason Codes

Station (Depth Interval)			UR-01-SS-19(2-6)					UR-01-SS-19(6-12)					UR-01-SS-20(0-2)					UR-01-SS-20(2-6)					UR-01-SS-20(6-12)					UR-01-SS-21(0-2)					UR-01-SS-21(2-6)				
Field Sample ID			BPSOU-UR01SS19-110221-2					BPSOU-UR01SS19-110221-3					BPSOU-UR01SS20-110221-1					BPSOU-UR01SS20-110221-2					BPSOU-UR01SS20-110221-3					BPSOU-UR01SS21-110221-1					BPSOU-UR01SS21-110221-2				
Lab Sample ID			10586277002					10586277003					N/A					N/A					N/A					10586267012					10586267013				
Sample Date			11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021				
Sample Type			Natural					Natural					Natural					Natural					Natural					Natural					Natural				
Method	Analyte	Units	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code
XRF	Arsenic	mg/kg	12.81			E		<9.07	<LOD		E		42.60			E		38.13			E		32.92			E		377.35			E		201.24			E	
XRF	Cadmium	mg/kg	<8.64	<LOD		E		10.38			E		<6.68	<LOD		E		<6.98	<LOD		E		<7.03	<LOD		E		<7.59	<LOD		E		<7.57	<LOD		E	
XRF	Copper	mg/kg	53.90			E		48.57			E		67.66			E		52.84			E		45.76			E		783.88			E		248.50			E	
XRF	Lead	mg/kg	50.53			E		49.16			E		31.26			E		18.88			E		16.03			E		111.01			E		44.26			E	
XRF	Mercury	mg/kg	<7.8	<LOD	UJ	S	CX	<8.57	<LOD	UJ	S	CX	<5.83	<LOD	UJ	S	CX	<6.4	<LOD	UJ	S	CX	<5.88	<LOD	UJ	S	CX	<7.2	<LOD	UJ	S	CX	<6.67	<LOD	UJ	S	CX
XRF	Zinc	mg/kg	149.59			E		179.44			E		94.57			E		93.26			E		91.03			E		319.24			E		203.76			E	
ASTM D2974	Moisture, Percent	%	5.2	N2		E		4.1	N2		E																	10.5	N2		E		9.6	N2		E	
SW-846 6010D	Arsenic	mg/kg	5.0			E		4.0			E																	195			E		158			E	
SW-846 6010D	Cadmium	mg/kg	0.30			E		0.24			E																	0.82			E		0.25			E	
SW-846 6010D	Copper	mg/kg	50.2			E		39.9			E																	398			E		224			E	
SW-846 6010D	Lead	mg/kg	39.1			E		37.2			E																	119			E		35.6			E	
SW-846 6010D	Zinc	mg/kg	97.2			E		102			E																	271			E		96.3			E	
SW-846 7471B	Mercury	mg/kg	0.057			E		0.065			E																	0.25			E		0.27			E	

Notes:
Depth intervals are inches below ground surface.

Qualification (Qual) and Reason Codes are
defined in Table A4.

< - Not detected at the detection limit.

Abbreviations:
mg/kg - milligram per kilogram

Table A1. Natural Sample Results with Laboratory Qualifiers; Data Validation Qualifiers; Enforcement, Screening, and Rejected Classifications; and Data Validation Reason Codes

Station (Depth Interval)			UR-01-SS-21(6-12)					UR-01-SS-22(0-2)					UR-01-SS-22(2-6)					UR-01-SS-22(6-12)					UR-01-SS-23(0-2)					UR-01-SS-23(2-6)					UR-01-SS-23(6-12)				
Field Sample ID			BPSOU-UR01SS21-110221-3					BPSOU-UR01SS22-110221-1					BPSOU-UR01SS22-110221-2					BPSOU-UR01SS22-110221-3					BPSOU-UR01SS23-110221-1					BPSOU-UR01SS23-110221-2					BPSOU-UR01SS23-110221-3				
Lab Sample ID			10586267014					N/A					10586267011					N/A					10586267008					10586267009					10586267010				
Sample Date			11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021				
Sample Type			Natural					Natural					Natural					Natural					Natural					Natural					Natural				
Method	Analyte	Units	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code
XRF	Arsenic	mg/kg	184.97			E		33.83			E		34.80			E		31.56			E		<21.81	<LOD		E		97.64			E		82.46			E	
XRF	Cadmium	mg/kg	<7.71	<LOD		E		<6.87	<LOD		E		<7.81	<LOD		E		<7.04	<LOD		E		<7.37	<LOD		E		10.27			E		<7.46	<LOD		E	
XRF	Copper	mg/kg	273.34			E		67.40			E		42.46			E		59.88			E		218.46			E		688.30			E		381.88			E	
XRF	Lead	mg/kg	25.09			E		28.82			E		21.66			E		24.60			E		590.29			E		1,579.49			E		967.11			E	
XRF	Mercury	mg/kg	<7.08	<LOD	UJ	S	CX	<5.86	<LOD	UJ	S	CX	<6.79	<LOD	UJ	S	CX	<6.14	<LOD	UJ	S	CX	<7.28	<LOD	UJ	S	CX	<8.15	<LOD	UJ	S	CX	<7.77	<LOD	UJ	S	CX
XRF	Zinc	mg/kg	103.75			E		79.20			E		90.44			E		92.40			E		1,515.18			E		1,458.42			E		1,425.47			E	
ASTM D2974	Moisture, Percent	%	10.0	N2		E							7.4	N2		E							6.7	N2		E		9.4	N2		E		12.1	N2		E	
SW-846 6010D	Arsenic	mg/kg	167			E							22.2			E							31.3			E		60.1			E		51.7			E	
SW-846 6010D	Cadmium	mg/kg	0.14	J	A	E	<RL						0.49			E							9.4			E		79.2			E		6.0			E	
SW-846 6010D	Copper	mg/kg	241			E							30.4			E							180			E		569			E		285			E	
SW-846 6010D	Lead	mg/kg	18.2			E							12.7			E							656			E		2,850			E		1,340			E	
SW-846 6010D	Zinc	mg/kg	60.0			E							42.0			E							2,010			E		22,800			E		1,310			E	
SW-846 7471B	Mercury	mg/kg	0.062			E							0.029			E							0.61			E		2.4			E		1.2			E	

Notes:
Depth intervals are inches below ground surface.

Qualification (Qual) and Reason Codes are
defined in Table A4.

< - Not detected at the detection limit.

Abbreviations:
mg/kg - milligram per kilogram

Table A1. Natural Sample Results with Laboratory Qualifiers; Data Validation Qualifiers; Enforcement, Screening, and Rejected Classifications; and Data Validation Reason Codes

Station (Depth Interval)			UR-01-SS-24(0-2)					UR-01-SS-24(2-6)					UR-01-SS-24(6-12)					UR-01-SS-25(0-2)					UR-01-SS-25(2-6)					UR-01-SS-25(6-12)					UR-01-SS-26(0-2)				
Field Sample ID			BPSOU-UR01SS24-110221-1					BPSOU-UR01SS24-110221-2					BPSOU-UR01SS24-110221-3					BPSOU-UR01SS25-110221-1					BPSOU-UR01SS25-110221-2					BPSOU-UR01SS25-110221-3					BPSOU-UR01SS26-110221-1				
Lab Sample ID			10586267007					N/A					N/A					10586267004					10586267005					N/A					N/A				
Sample Date			11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021				
Sample Type			Natural					Natural					Natural					Natural					Natural					Natural					Natural				
Method	Analyte	Units	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code
XRF	Arsenic	mg/kg	10.09			E		12.85			E		10.03			E		12.45			E		17.74			E		7.30			E		27.87			E	
XRF	Cadmium	mg/kg	<6.8	<LOD		E		<7.28	<LOD		E		<7.58	<LOD		E		<6.93	<LOD		E		<7.08	<LOD		E		<5.6	<LOD		E		<7.16	<LOD		E	
XRF	Copper	mg/kg	90.55			E		63.94			E		52.19			E		76.37			E		98.84			E		51.22			E		77.70			E	
XRF	Lead	mg/kg	55.76			E		40.46			E		21.07			E		63.10			E		72.18			E		31.23			E		53.98			E	
XRF	Mercury	mg/kg	<6.03	<LOD	UJ	S	CX	<6.49	<LOD	UJ	S	CX	<6.5	<LOD	UJ	S	CX	<6.35	<LOD	UJ	S	CX	<6.58	<LOD	UJ	S	CX	<5.34	<LOD	UJ	S	CX	<6.17	<LOD	UJ	S	CX
XRF	Zinc	mg/kg	217.63			E		171.49			E		115.90			E		199.71			E		233.38			E		136.54			E		204.11			E	
ASTM D2974	Moisture, Percent	%	8.8	N2		E												8.0	N2		E		19.6	N2		E											
SW-846 6010D	Arsenic	mg/kg	6.4			E												7.1		J	S	FD	6.9			E											
SW-846 6010D	Cadmium	mg/kg	0.50			E												0.49			E		0.44			E											
SW-846 6010D	Copper	mg/kg	49.5			E												55.4			E		55.5			E											
SW-846 6010D	Lead	mg/kg	47.3			E												54.2			E		58.9			E											
SW-846 6010D	Zinc	mg/kg	147			E												155			E		149			E											
SW-846 7471B	Mercury	mg/kg	0.069			E												0.052			E		0.042			E											

Notes:
Depth intervals are inches below ground surface.

Qualification (Qual) and Reason Codes are
defined in Table A4.

< - Not detected at the detection limit.

Abbreviations:
mg/kg - milligram per kilogram

Table A1. Natural Sample Results with Laboratory Qualifiers; Data Validation Qualifiers; Enforcement, Screening, and Rejected Classifications; and Data Validation Reason Codes

Station (Depth Interval)			UR-01-SS-26(2-6)					UR-01-SS-26(6-12)					UR-01-SS-27(0-2)					UR-01-SS-27(2-6)					UR-01-SS-27(6-12)				
Field Sample ID			BPSOU-UR01SS26-110221-2					BPSOU-UR01SS26-110221-3					BPSOU-UR01SS27-110221-1					BPSOU-UR01SS27-110221-2					BPSOU-UR01SS27-110221-3				
Lab Sample ID			10586267002					10586267003					N/A					N/A					10586267001				
Sample Date			11/2/2021					11/2/2021					11/2/2021					11/2/2021					11/2/2021				
Sample Type			Natural					Natural					Natural					Natural					Natural				
Method	Analyte	Units	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code	Result	Lab Qual	DV Qual	S/E	Reason Code
XRF	Arsenic	mg/kg	23.00			E		19.56			E		14.91			E		28.25			E		9.93			E	
XRF	Cadmium	mg/kg	9.14			E		<7.59	<LOD		E		9.18			E		8.22			E		<7.66	<LOD		E	
XRF	Copper	mg/kg	84.51			E		105.37			E		63.67			E		77.56			E		93.76			E	
XRF	Lead	mg/kg	116.97			E		159.78			E		31.96			E		60.63			E		37.26			E	
XRF	Mercury	mg/kg	<6.83	<LOD	UJ	S	CX	<6.81	<LOD	UJ	S	CX	<6.38	<LOD	UJ	S	CX	<6.49	<LOD	UJ	S	CX	<6.61	<LOD	UJ	S	CX
XRF	Zinc	mg/kg	337.29			E		341.91			E		132.88			E		260.11			E		148.24			E	
ASTM D2974	Moisture, Percent	%	7.7	N2		E		5.8	N2		E												4.6	N2		E	
SW-846 6010D	Arsenic	mg/kg	14.8			E		15.5			E												6.1			E	
SW-846 6010D	Cadmium	mg/kg	2.8			E		1.9			E												0.35			E	
SW-846 6010D	Copper	mg/kg	77.7			E		92.5			E												64.5			E	
SW-846 6010D	Lead	mg/kg	148			E		288			E												25.3	M1	J-	S	S%
SW-846 6010D	Zinc	mg/kg	334			E		405			E												98.6	M1	J-	S	S%
SW-846 7471B	Mercury	mg/kg	0.092			E		0.21			E												0.034	M1	J-	S	S%

Notes:
Depth intervals are inches below ground surface.

Qualification (Qual) and Reason Codes are
defined in Table A4.

< - Not detected at the detection limit.

Abbreviations:
mg/kg - milligram per kilogram

Table A2. Field Duplicate Pair Samples with Results, Laboratory Qualifiers, Data Validation Qualifiers, Data Validation Reason Codes, and QC Criteria Assessment

Station (Depth Interval)			UR-01-SS-01(6-12)						UR-01-SS-01(6-12)-FD									
Field Sample ID			BPSOU-UR01SS01-110321-3						BPSOU-UR01SS01-110321-3-FD									
Lab Sample ID			10586277013						10586277014									
Sample Date			11/3/2021						11/3/2021									
Sample Type			Natural Sample						Field Duplicate									
Method	Analyte	Units	Result	Lab Qual	DV Qual	Reason Code	DF	RL	Result	Lab Qual	DV Qual	Reason Code	DF	RL	Control Limit[1]	ABS DIF	RPD	Meets Control Limit?
XRF	Arsenic	mg/kg	9.86				1	N/A	7.94				1	N/A	RPD≤35%		22%	Yes
XRF	Cadmium	mg/kg	<7.88	<LOD			1	N/A	<7.63	<LOD			1	N/A	N/A		-	-
XRF	Copper	mg/kg	79.01				1	N/A	73.98				1	N/A	RPD≤35%		7%	Yes
XRF	Lead	mg/kg	26.26				1	N/A	21.84				1	N/A	RPD≤35%		18%	Yes
XRF	Mercury	mg/kg	<7.09	<LOD	UJ	CX	1	N/A	<6.79	<LOD	UJ	CX	1	N/A	N/A		-	-
XRF	Zinc	mg/kg	187.34				1	N/A	138.27				1	N/A	RPD≤35%		30%	Yes
ASTM D2974	Moisture, Percent	%	3.7	N2			1	0.1	3.6	N2			1	0.1	RPD≤35%		4%	Yes
SW-846 6010D	Arsenic	mg/kg	3.4				1	1.0	3.1				1	1.0	ABS DIF≤2xRL	0.30		Yes
SW-846 6010D	Cadmium	mg/kg	0.16				1	0.15	0.18				1	0.15	ABS DIF≤2xRL	0.020		Yes
SW-846 6010D	Copper	mg/kg	42.1				1	0.51	45.4				1	0.48	RPD≤35%		8%	Yes
SW-846 6010D	Lead	mg/kg	24.7				2	1.00	20.2				2	0.97	RPD≤35%		20%	Yes
SW-846 6010D	Zinc	mg/kg	75.5				1	2.1	76.9				1	1.9	RPD≤35%		2%	Yes
SW-846 7471B	Mercury	mg/kg	0.0098	J	A	<RL	1	0.018	0.018	J	A	<RL	1	0.021	ABS DIF≤2xRL	0.0082		Yes

Station (Depth Interval)			UR-01-SS-02(2-6)						UR-01-SS-02(2-6)-FD									
Field Sample ID			BPSOU-UR01SS02-110321-2						BPSOU-UR01SS02-110321-2-FD									
Lab Sample ID			10586396012						10586396013									
Sample Date			11/3/2021						11/3/2021									
Sample Type			Natural Sample						Field Duplicate									
Method	Analyte	Units	Result	Lab Qual	DV Qual	Reason Code	DF	RL	Result	Lab Qual	DV Qual	Reason Code	DF	RL	Control Limit[1]	ABS DIF	RPD	Meets Control Limit?
XRF	Arsenic	mg/kg	<5.5	<LOD			1	N/A	6.64				1	N/A	N/A		-	-
XRF	Cadmium	mg/kg	10.89				1	N/A	9.14				1	N/A	RPD≤35%		17%	Yes
XRF	Copper	mg/kg	55.18				1	N/A	65.49				1	N/A	RPD≤35%		17%	Yes
XRF	Lead	mg/kg	13.06				1	N/A	14.51				1	N/A	RPD≤35%		11%	Yes
XRF	Mercury	mg/kg	<7.26	<LOD	UJ	CX	1	N/A	<6.87	<LOD	UJ	CX	1	N/A	N/A		-	-
XRF	Zinc	mg/kg	101.97				1	N/A	100.34				1	N/A	RPD≤35%		2%	Yes
ASTM D2974	Moisture, Percent	%	4.6	N2			1	0.1	4.7	N2			1	0.1	RPD≤35%		2%	Yes
SW-846 6010D	Arsenic	mg/kg	2.4				1	1.0	2.3				1	1.0	ABS DIF≤2xRL	0.10		Yes
SW-846 6010D	Cadmium	mg/kg	0.11	J	A	<RL	1	0.15	0.14	J	A	<RL	1	0.15	ABS DIF≤2xRL	0.030		Yes
SW-846 6010D	Copper	mg/kg	41.5				1	0.50	42.2				1	0.51	RPD≤35%		2%	Yes
SW-846 6010D	Lead	mg/kg	6.1		J	FD	2	1.0	31.0		J	FD	2	1.00	RPD≤35%		134%	RPD>35%
SW-846 6010D	Zinc	mg/kg	46.1				1	2.00	53.1				1	2.1	RPD≤35%		14%	Yes
SW-846 7471B	Mercury	mg/kg	0.010	J	A	<RL	1	0.020	<0.008	U			1	0.019	ABS DIF≤2xRL	0.002		Yes

Notes:

Qualification (Qual) and Reason Codes are defined in Table A4.

< - Not detected at the detection limit.

The qualifications made to the field duplicate samples (DV Qual/Reason Code) are not included in the summary of qualifications made to natural samples discussed in the Data Validation Report.

Depth intervals are inches below ground surface.

Abbreviations:

DF - dilution factor

RL - reporting limit

ABS DIF - absolute difference

RPD - relative percent difference

mg/kg - milligram per kilogram

Footnotes:

1. If the control limit is an absolute difference less than 2 times the reporting limit, the minimum adjusted reporting limit will be used.

Table A2. Field Duplicate Pair Samples with Results, Laboratory Qualifiers, Data Validation Qualifiers, Data Validation Reason Codes, and QC Criteria Assessment

Station (Depth Interval)			UR-01-SS-06(0-2)						UR-01-SS-06(0-2)-FD									
Field Sample ID			BPSOU-UR01SS06-110321-1						BPSOU-UR01SS06-110321-1-FD									
Lab Sample ID			10587272010						10587272011									
Sample Date			11/3/2021						11/3/2021									
Sample Type			Natural Sample						Field Duplicate									
Method	Analyte	Units	Result	Lab Qual	DV Qual	Reason Code	DF	RL	Result	Lab Qual	DV Qual	Reason Code	DF	RL	Control Limit[1]	ABS DIF	RPD	Meets Control Limit?
XRF	Arsenic	mg/kg	8.01				1	N/A	6.61				1	N/A	RPD≤35%		19%	Yes
XRF	Cadmium	mg/kg	<7.31	<LOD			1	N/A	9.23				1	N/A	N/A		-	-
XRF	Copper	mg/kg	65.65				1	N/A	66.37				1	N/A	RPD≤35%		1%	Yes
XRF	Lead	mg/kg	15.37				1	N/A	19.58				1	N/A	RPD≤35%		24%	Yes
XRF	Mercury	mg/kg	<6.64	<LOD	UJ	CX	1	N/A	<7.03	<LOD	UJ	CX	1	N/A	N/A		-	-
XRF	Zinc	mg/kg	108.76				1	N/A	112.30				1	N/A	RPD≤35%		3%	Yes
ASTM D2974	Moisture, Percent	%	7.1	N2			1	0.1	6.8	N2			1	0.1	RPD≤35%		4%	Yes
SW-846 6010D	Arsenic	mg/kg	3.2				1	1.0	3.2				1	1.0	ABS DIF≤2xRL	0.00		Yes
SW-846 6010D	Cadmium	mg/kg	0.14	J	A	<RL	1	0.16	0.13	J	A	<RL	1	0.15	ABS DIF≤2xRL	0.010		Yes
SW-846 6010D	Copper	mg/kg	40.0				1	0.52	42.8				1	0.51	RPD≤35%		7%	Yes
SW-846 6010D	Lead	mg/kg	22.4				2	1.0	18.6				2	1.0	RPD≤35%		19%	Yes
SW-846 6010D	Zinc	mg/kg	53.5				1	2.1	55.5				1	2.0	RPD≤35%		4%	Yes
SW-846 7471B	Mercury	mg/kg	0.016	J	J-	Pres, <RL	1	0.018	0.017	J	J-	Pres, <RL	1	0.018	ABS DIF≤2xRL	0.001		Yes

Station (Depth Interval)			UR-01-SS-07(0-2)						UR-01-SS-07(0-2)-FD									
Field Sample ID			BPSOU-UR01SS07-110321-1						BPSOU-UR01SS07-110321-1-FD									
Lab Sample ID			10587272013						N/A									
Sample Date			11/3/2021						11/3/2021									
Sample Type			Natural Sample						Field Duplicate									
Method	Analyte	Units	Result	Lab Qual	DV Qual	Reason Code	DF	RL	Result[2]	Lab Qual	DV Qual	Reason Code	DF	RL	Control Limit[1]	ABS DIF	RPD	Meets Control Limit?
XRF	Arsenic	mg/kg	7.57				1	N/A	9.21				1	N/A	RPD≤35%		20%	Yes
XRF	Cadmium	mg/kg	<7.5	<LOD			1	N/A	<7.29	<LOD			1	N/A	N/A		-	-
XRF	Copper	mg/kg	63.66				1	N/A	54.07				1	N/A	RPD≤35%		16%	Yes
XRF	Lead	mg/kg	17.71		J	FD	1	N/A	29.48		J	FD	1	N/A	RPD≤35%		50%	RPD>35%
XRF	Mercury	mg/kg	<6.55	<LOD	UJ	CX	1	N/A	<6.38	<LOD	UJ	CX	1	N/A	N/A		-	-
XRF	Zinc	mg/kg	123.77				1	N/A	108.02				1	N/A	RPD≤35%		14%	Yes
ASTM D2974	Moisture, Percent	%	5.1	N2			1	0.1							N/A		-	-
SW-846 6010D	Arsenic	mg/kg	2.0				1	1.0							N/A		-	-
SW-846 6010D	Cadmium	mg/kg	0.17				1	0.15							N/A		-	-
SW-846 6010D	Copper	mg/kg	31.2				1	0.51							N/A		-	-
SW-846 6010D	Lead	mg/kg	9.2				2	1.0							N/A		-	-
SW-846 6010D	Zinc	mg/kg	55.5				1	2.0							N/A		-	-
SW-846 7471B	Mercury	mg/kg	0.013	J	J-	Pres, <RL	1	0.020							N/A		-	-

Notes:

Qualification (Qual) and Reason Codes are defined in Table A4.

< - Not detected at the detection limit.

The qualifications made to the field duplicate samples (DV Qual/Reason Code) are not included in the summary of qualifications made to natural samples discussed in the Data Validation Report.

Depth intervals are inches below ground surface.

Abbreviations:

DF - dilution factor

RL - reporting limit

ABS DIF - absolute difference

RPD - relative percent difference

mg/kg - milligram per kilogram

Footnotes:

1. If the control limit is an absolute difference less than 2 times the reporting limit, the minimum adjusted reporting limit will be used.
2. Field duplicate sample was not sent to the lab for analysis.

Table A2. Field Duplicate Pair Samples with Results, Laboratory Qualifiers, Data Validation Qualifiers, Data Validation Reason Codes, and QC Criteria Assessment

Station (Depth Interval)			UR-01-SS-25(0-2)						UR-01-SS-25(0-2)-FD									
Field Sample ID			BPSOU-UR01SS25-110221-1						BPSOU-UR01SS25-110221-1-FD									
Lab Sample ID			10586267004						10586267006									
Sample Date			11/2/2021						11/2/2021									
Sample Type			Natural Sample						Field Duplicate									
Method	Analyte	Units	Result	Lab Qual	DV Qual	Reason Code	DF	RL	Result	Lab Qual	DV Qual	Reason Code	DF	RL	Control Limit[1]	ABS DIF	RPD	Meets Control Limit?
XRF	Arsenic	mg/kg	12.45				1	N/A	12.85				1	N/A	RPD≤35%		3%	Yes
XRF	Cadmium	mg/kg	<6.93	<LOD			1	N/A	<6.5	<LOD			1	N/A	N/A		-	-
XRF	Copper	mg/kg	76.37				1	N/A	87.31				1	N/A	RPD≤35%		13%	Yes
XRF	Lead	mg/kg	63.10				1	N/A	51.22				1	N/A	RPD≤35%		21%	Yes
XRF	Mercury	mg/kg	<6.35	<LOD	UJ	CX	1	N/A	<5.88	<LOD	UJ	CX	1	N/A	N/A		-	-
XRF	Zinc	mg/kg	199.71				1	N/A	213.02				1	N/A	RPD≤35%		6%	Yes
ASTM D2974	Moisture, Percent	%	8.0	N2			1	0.1	8.4	N2			1	0.1	RPD≤35%		6%	Yes
SW-846 6010D	Arsenic	mg/kg	7.1		J	FD	2	2.0	4.8		J	FD	1	1.0	ABS DIF≤2xRL	2.3		ABS DIFF>2xRL
SW-846 6010D	Cadmium	mg/kg	0.49				2	0.30	0.33				1	0.16	ABS DIF≤2xRL	0.16		Yes
SW-846 6010D	Copper	mg/kg	55.4				2	1.0	42.3				1	0.52	RPD≤35%		27%	Yes
SW-846 6010D	Lead	mg/kg	54.2				2	1.0	54.7				1	0.52	RPD≤35%		1%	Yes
SW-846 6010D	Zinc	mg/kg	155				2	4.1	113				1	2.1	RPD≤35%		31%	Yes
SW-846 7471B	Mercury	mg/kg	0.052				1	0.020	0.033				1	0.020	ABS DIF≤2xRL	0.019		Yes

Notes:

Qualification (Qual) and Reason Codes are defined in Table A4.

< - Not detected at the detection limit.

The qualifications made to the field duplicate samples (DV Qual/Reason Code) are not included in the summary of qualifications made to natural samples discussed in the Data Validation Report.

Depth intervals are inches below ground surface.

Abbreviations:

DF - dilution factor

RL - reporting limit

ABS DIF - absolute difference

RPD - relative percent difference

mg/kg - milligram per kilogram

Footnotes:

1. If the control limit is an absolute difference less than 2 times the reporting limit, the minimum adjusted reporting limit will be used.

Table A3. Sample Identification

Station ID	Field Sample ID	Sample Type	Depth Interval (in bgs)	Sample Date	XRF	Lab ID	ASTM D2974	SW-846 6010D	SW-846 7471B
UR-01-OP-01	BPSOU-UR01OP01-110221-1	Natural	0 - 2	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-OP-01	BPSOU-UR01OP01-110221-2	Natural	2 - 6	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-OP-01	BPSOU-UR01OP01-110221-3	Natural	6 - 12	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-01	BPSOU-UR01SS01-110321-1	Natural	0 - 2	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-01	BPSOU-UR01SS01-110321-2	Natural	2 - 6	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	10586277012	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-01	BPSOU-UR01SS01-110321-3	Natural	6 - 12	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	10586277013	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-01	BPSOU-UR01SS01-110321-3-FD	Field Duplicate	6 - 12	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	10586277014	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-02	BPSOU-UR01SS02-110321-1	Natural	0 - 2	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-02	BPSOU-UR01SS02-110321-2	Natural	2 - 6	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	10586396012	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-02	BPSOU-UR01SS02-110321-2-FD	Field Duplicate	2 - 6	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	10586396013	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-02	BPSOU-UR01SS02-110321-3	Natural	6 - 12	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-03	BPSOU-UR01SS03-110321-1	Natural	0 - 2	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	10587272001	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-03	BPSOU-UR01SS03-110321-2	Natural	2 - 6	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	10587272002	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-03	BPSOU-UR01SS03-110321-3	Natural	6 - 12	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	10587272003	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-04	BPSOU-UR01SS04-110321-1	Natural	0 - 2	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	10587272004	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-04	BPSOU-UR01SS04-110321-2	Natural	2 - 6	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	10587272005	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-04	BPSOU-UR01SS04-110321-3	Natural	6 - 12	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	10587272006	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-05	BPSOU-UR01SS05-110321-1	Natural	0 - 2	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	10587272007	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-05	BPSOU-UR01SS05-110321-2	Natural	2 - 6	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	10587272008	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-05	BPSOU-UR01SS05-110321-3	Natural	6 - 12	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	10587272009	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-06	BPSOU-UR01SS06-110321-1	Natural	0 - 2	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	10587272010	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-06	BPSOU-UR01SS06-110321-1-FD	Field Duplicate	0 - 2	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	10587272011	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-06	BPSOU-UR01SS06-110321-2	Natural	2 - 6	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	10587272012	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-06	BPSOU-UR01SS06-110321-3	Natural	6 - 12	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-07	BPSOU-UR01SS07-110321-1	Natural	0 - 2	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	10587272013	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-07	BPSOU-UR01SS07-110321-1-FD	Field Duplicate	0 - 2	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-07	BPSOU-UR01SS07-110321-2	Natural	2 - 6	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	10587272014	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-07	BPSOU-UR01SS07-110321-3	Natural	6 - 12	11/3/2021	As, Cd, Cu, Pb, Hg, Zn	10587273014	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-08	BPSOU-UR01SS08-110221-1	Natural	0 - 2	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586396009	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-08	BPSOU-UR01SS08-110221-2	Natural	2 - 6	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586396010	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-08	BPSOU-UR01SS08-110221-3	Natural	6 - 12	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586396011	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-09	BPSOU-UR01SS09-110221-1	Natural	0 - 2	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-09	BPSOU-UR01SS09-110221-2	Natural	2 - 6	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			

Table A3. Sample Identification

Station ID	Field Sample ID	Sample Type	Depth Interval (in bgs)	Sample Date	XRF	Lab ID	ASTM D2974	SW-846 6010D	SW-846 7471B
UR-01-SS-09	BPSOU-UR01SS09-110221-3	Natural	6 - 12	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-10	BPSOU-UR01SS10-110221-1	Natural	0 - 2	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-10	BPSOU-UR01SS10-110221-2	Natural	2 - 6	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586396007	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-10	BPSOU-UR01SS10-110221-3	Natural	6 - 12	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586396008	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-11	BPSOU-UR01SS11-110221-1	Natural	0 - 2	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-11	BPSOU-UR01SS11-110221-2	Natural	2 - 6	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586396005	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-11	BPSOU-UR01SS11-110221-3	Natural	6 - 12	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586396006	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-12	BPSOU-UR01SS12-110221-1	Natural	0 - 2	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-12	BPSOU-UR01SS12-110221-2	Natural	2 - 6	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586396004	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-12	BPSOU-UR01SS12-110221-3	Natural	6 - 12	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-13	BPSOU-UR01SS13-110221-1	Natural	0 - 2	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586396001	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-13	BPSOU-UR01SS13-110221-2	Natural	2 - 6	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586396002	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-13	BPSOU-UR01SS13-110221-3	Natural	6 - 12	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586396003	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-15	BPSOU-UR01SS15-110221-1	Natural	0 - 2	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586277009	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-15	BPSOU-UR01SS15-110221-2	Natural	2 - 6	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586277010	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-15	BPSOU-UR01SS15-110221-3	Natural	6 - 12	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586277011	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-16	BPSOU-UR01SS16-110221-1	Natural	0 - 2	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-16	BPSOU-UR01SS16-110221-2	Natural	2 - 6	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586277007	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-16	BPSOU-UR01SS16-110221-3	Natural	6 - 12	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586277008	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-17	BPSOU-UR01SS17-110221-1	Natural	0 - 2	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-17	BPSOU-UR01SS17-110221-2	Natural	2 - 6	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-17	BPSOU-UR01SS17-110221-3	Natural	6 - 12	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-18	BPSOU-UR01SS18-110221-1	Natural	0 - 2	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586277004	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-18	BPSOU-UR01SS18-110221-2	Natural	2 - 6	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586277005	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-18	BPSOU-UR01SS18-110221-3	Natural	6 - 12	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586277006	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-19	BPSOU-UR01SS19-110221-1	Natural	0 - 2	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586277001	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-19	BPSOU-UR01SS19-110221-2	Natural	2 - 6	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586277002	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-19	BPSOU-UR01SS19-110221-3	Natural	6 - 12	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586277003	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-20	BPSOU-UR01SS20-110221-1	Natural	0 - 2	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-20	BPSOU-UR01SS20-110221-2	Natural	2 - 6	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-20	BPSOU-UR01SS20-110221-3	Natural	6 - 12	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-21	BPSOU-UR01SS21-110221-1	Natural	0 - 2	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586267012	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-21	BPSOU-UR01SS21-110221-2	Natural	2 - 6	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586267013	moisture	As, Cd, Cu, Pb, Zn	Hg

Table A3. Sample Identification

Station ID	Field Sample ID	Sample Type	Depth Interval (in bgs)	Sample Date	XRF	Lab ID	ASTM D2974	SW-846 6010D	SW-846 7471B
UR-01-SS-21	BPSOU-UR01SS21-110221-3	Natural	6 - 12	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586267014	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-22	BPSOU-UR01SS22-110221-1	Natural	0 - 2	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-22	BPSOU-UR01SS22-110221-2	Natural	2 - 6	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586267011	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-22	BPSOU-UR01SS22-110221-3	Natural	6 - 12	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-23	BPSOU-UR01SS23-110221-1	Natural	0 - 2	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586267008	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-23	BPSOU-UR01SS23-110221-2	Natural	2 - 6	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586267009	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-23	BPSOU-UR01SS23-110221-3	Natural	6 - 12	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586267010	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-24	BPSOU-UR01SS24-110221-1	Natural	0 - 2	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586267007	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-24	BPSOU-UR01SS24-110221-2	Natural	2 - 6	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-24	BPSOU-UR01SS24-110221-3	Natural	6 - 12	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-25	BPSOU-UR01SS25-110221-1	Natural	0 - 2	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586267004	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-25	BPSOU-UR01SS25-110221-1-FD	Field Duplicate	0 - 2	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586267006	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-25	BPSOU-UR01SS25-110221-2	Natural	2 - 6	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586267005	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-25	BPSOU-UR01SS25-110221-3	Natural	6 - 12	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-26	BPSOU-UR01SS26-110221-1	Natural	0 - 2	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-26	BPSOU-UR01SS26-110221-2	Natural	2 - 6	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586267002	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-26	BPSOU-UR01SS26-110221-3	Natural	6 - 12	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586267003	moisture	As, Cd, Cu, Pb, Zn	Hg
UR-01-SS-27	BPSOU-UR01SS27-110221-1	Natural	0 - 2	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-27	BPSOU-UR01SS27-110221-2	Natural	2 - 6	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	N/A			
UR-01-SS-27	BPSOU-UR01SS27-110221-3	Natural	6 - 12	11/2/2021	As, Cd, Cu, Pb, Hg, Zn	10586267001	moisture	As, Cd, Cu, Pb, Zn	Hg

Abbreviations:

in bgs - inches below ground surface
As - arsenic
Cd - cadmium
Cu - copper
Pb - lead
Hg - mercury
Zn - zinc

Table A4. Laboratory Qualifiers; Data Validation Qualifiers; Enforcement, Screening, and Rejected Codes; and Reason Codes Definitions

Lab Qual (Pace Analytical Services [Pace] Qualifiers)

J = Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

M1 = Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

R1 = RPD value was outside control limits.

U = Indicates the compound was analyzed for, but not detected.

N2 = The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply.

XRF Qual (XRF Qualifiers)

<LOD = Not detected at the reporting limit.

DV Qual (Data Validation Qualifiers)

A = results between the MDL and RL with no other qualifiers required are considered enforcement quality data.

J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

J- = The result is an estimated quantity, but the result may be biased low

UJ = The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

S/E (Screening/Enforcement Quality Designation)

E = Enforcement quality.

S = Screening quality.

R = Unusable (Rejected) quality.

Reason Code (Data Validation Reason Codes)

<RL = Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

D% = Qualified due to laboratory or XRF duplicate results outside control limits.

R% = Qualified due to XRF replicate results outside control limits.

FD = Qualified due to field duplicate results outside of control limits.

Pres = Qualified because preservation requirement was not met.

S% = Qualified due to percent recovery of the matrix spike outside of control limits.

CX = Qualified because frequency of check samples was not satisfied.

Table A5. XRF SiO2 Standard and Calibration Check Sample Results

		Analyte	Arsenic		Cadmium		Copper		Lead		Mercury		Zinc	
Standard Type	Sample ID	Analysis Date	Result (mg/kg)	Meets Control Limit (<10 mg/kg)	Result (mg/kg)	Meets Control Limit (<50 mg/kg)	Result (mg/kg)	Meets Control Limit (<20 mg/kg)	Result (mg/kg)	Meets Control Limit (<10 mg/kg)	Result (mg/kg)	Meets Control Limit (<10 mg/kg)	Result (mg/kg)	Meets Control Limit (<10 mg/kg)
SiO2	P_20211102_98052_142	11/2/2021	<2.95	Yes	9.99	Yes	<11.74	Yes	<3.85	Yes	<4.94	Yes	<5.85	Yes
SiO2	P_20211102_98052_179	11/2/2021	<2.61	Yes	9.47	Yes	<11.97	Yes	<3.36	Yes	<4.67	Yes	<5.47	Yes
SiO2	P_20211103_98052_184	11/3/2021	<2.58	Yes	12.49	Yes	<11.51	Yes	<3.31	Yes	<4.79	Yes	<5.78	Yes
SiO2	P_20211103_98052_210	11/3/2021	<2.65	Yes	8.48	Yes	<11.42	Yes	<3.47	Yes	<4.81	Yes	<5.67	Yes
SiO2	P_20211103_98052_236	11/3/2021	<2.5	Yes	14.97	Yes	<11.46	Yes	<3.2	Yes	<4.67	Yes	<5.6	Yes
SiO2	P_20211103_98052_262	11/3/2021	<2.78	Yes	9.54	Yes	<11.4	Yes	<3.51	Yes	<4.68	Yes	<5.48	Yes
SiO2	P_20211103_98052_278	11/3/2021	<2.59	Yes	8.71	Yes	<11.96	Yes	<3.38	Yes	<4.78	Yes	<5.17	Yes

		Analyte	Arsenic		Cadmium		Copper		Lead		Mercury		Zinc	
Standard Type	Sample ID	Analysis Date	Result (mg/kg)	Meets Control Limit (0-35 mg/kg)	Result (mg/kg)	Meets Control Limit (0-60 mg/kg)	Result (mg/kg)	Meets Control Limit (0-60 mg/kg)	Result (mg/kg)	Meets Control Limit (0-35 mg/kg)	Result (mg/kg)	Meets Control Limit (0-12 mg/kg)	Result (mg/kg)	Meets Control Limit (50-160 mg/kg)
NIST 2709a	P_20211102_98052_143	11/2/2021	11.10	Yes	15.03	Yes	30.45	Yes	19.15	Yes	<6.52	Yes	85.61	Yes
NIST 2709a	P_20211102_98052_180	11/2/2021	16.99	Yes	<7.63	Yes	35.29	Yes	18.87	Yes	<6.41	Yes	87.29	Yes
NIST 2709a	P_20211103_98052_185	11/3/2021	13.66	Yes	10.15	Yes	34.37	Yes	14.80	Yes	<6.31	Yes	88.69	Yes
NIST 2709a	P_20211103_98052_211	11/3/2021	16.03	Yes	12.59	Yes	22.93	Yes	10.63	Yes	<6.33	Yes	89.77	Yes
NIST 2709a	P_20211103_98052_237	11/3/2021	15.57	Yes	12.53	Yes	29.04	Yes	17.33	Yes	<6.27	Yes	89.82	Yes
NIST 2709a	P_20211103_98052_263	11/3/2021	15.58	Yes	<7.63	Yes	34.58	Yes	12.82	Yes	<6.58	Yes	94.92	Yes
NIST 2709a	P_20211103_98052_279	11/3/2021	11.10	Yes	10.36	Yes	27.43	Yes	15.84	Yes	<6.21	Yes	95.40	Yes

		Analyte	Arsenic		Cadmium		Copper		Lead		Mercury		Zinc	
Standard Type	Sample ID	Analysis Date	Result (mg/kg)	Meets Control Limit (400-600 mg/kg)	Result (mg/kg)	Meets Control Limit (400-600 mg/kg)	Result (mg/kg)	Meets Control Limit (N/A)	Result (mg/kg)	Meets Control Limit (400-600 mg/kg)	Result (mg/kg)	Meets Control Limit (N/A)	Result (mg/kg)	Meets Control Limit (N/A)
RCRA	P_20211102_98052_144	11/2/2021	481.05	Yes	491.23	Yes	27.05	N/A	475.35	Yes	<7.09	N/A	43.63	N/A
RCRA	P_20211102_98052_181	11/2/2021	487.28	Yes	526.02	Yes	<15.58	N/A	480.72	Yes	<6.8	N/A	53.67	N/A
RCRA	P_20211103_98052_186	11/3/2021	491.76	Yes	508.38	Yes	21.82	N/A	468.85	Yes	<6.79	N/A	44.86	N/A
RCRA	P_20211103_98052_212	11/3/2021	514.58	Yes	527.54	Yes	27.13	N/A	490.14	Yes	<7.18	N/A	44.44	N/A
RCRA	P_20211103_98052_238	11/3/2021	495.94	Yes	517.56	Yes	29.61	N/A	480.15	Yes	<6.92	N/A	47.68	N/A
RCRA	P_20211103_98052_264	11/3/2021	488.94	Yes	528.01	Yes	28.25	N/A	480.94	Yes	<7.02	N/A	46.89	N/A
RCRA	P_20211103_98052_281	11/3/2021	494.77	Yes	515.81	Yes	20.93	N/A	476.34	Yes	<6.89	N/A	50.07	N/A

Notes:

< - Not detected value is the XRF error for analysis.

Abbreviations:

mg/kg - milligram per kilogram

SiO2 - Silicon Dioxide standard

NIST 2709a - NIST 2709a- Joaquin Soil sample

RCRA - Resource Conservation and Recovery Act Sample

Table A6. XRF Duplicate and Replicate Sample Results and QC Criteria Assessment

				Analyte	Arsenic		Cadmium		Copper		Lead		Mercury		Zinc	
Standard Type	Sample ID	Sample Name	Parent Sample	Analysis Date	Result (mg/kg)	RPD	Result (mg/kg)	RPD	Result (mg/kg)	RPD	Result (mg/kg)	RPD	Result (mg/kg)	RPD	Result (mg/kg)	RPD
Natural	P_20211102_98052_169	BPSOU-UR01SS22-110221-1		11/2/2021	33.83		<6.87		67.40		28.82		<5.86		79.20	
XRF Replicate	P_20211102_98052_177	BPSOU-UR01SS22-110221-1-R	BPSOU-UR01SS22-110221-1	11/2/2021	31.11	8.4%	<7.1	ND	50.55	28.6%	25.39	12.7%	<5.81	ND	85.52	7.7%
XRF Duplicate	P_20211102_98052_170	BPSOU-UR01SS22-110221-1-D	BPSOU-UR01SS22-110221-1	11/2/2021	30.87	9.2%	<7.05	ND	67.28	0.2%	25.82	11.0%	<5.89	ND	86.15	8.4%
Natural	P_20211103_98052_206	BPSOU-UR01SS15-110221-2		11/3/2021	17.05		10.24		103.46		157.75		<6.95		360.53	
XRF Replicate	P_20211103_98052_207	BPSOU-UR01SS15-110221-2-R	BPSOU-UR01SS15-110221-2	11/3/2021	13.55	22.9%	<7.54	ND	102.98	0.5%	161.64	2.4%	<6.92	ND	354.50	1.7%
XRF Duplicate	P_20211103_98052_208	BPSOU-UR01SS15-110221-2-D	BPSOU-UR01SS15-110221-2	11/3/2021	22.38	27.0%	<7.59	ND	120.73	15.4%	361.21	78.4%	<7.12	ND	442.50	20.4%
Natural	P_20211103_98052_232	BPSOU-UR01SS13-110221-3		11/3/2021	12.29		9.41		74.15		17.39		<6.51		132.37	
XRF Replicate	P_20211103_98052_233	BPSOU-UR01SS13-110221-3-R	BPSOU-UR01SS13-110221-3	11/3/2021	7.82	44.5%	<7.38	ND	65.58	12.3%	13.41	25.8%	<6.34	ND	134.00	1.2%
XRF Duplicate	P_20211103_98052_234	BPSOU-UR01SS13-110221-3-D	BPSOU-UR01SS13-110221-3	11/3/2021	6.11	67.2%	<7.49	ND	58.63	23.4%	14.20	20.2%	<6.83	ND	134.40	1.5%
Natural	P_20211103_98052_258	BPSOU-UR01SS05-110321-2		11/3/2021	<14.42		<7.84		78.79		211.17		<7.21		287.40	
XRF Replicate	P_20211103_98052_259	BPSOU-UR01SS05-110321-2-R	BPSOU-UR01SS05-110321-2	11/3/2021	24.55	ND	<7.98	ND	69.50	12.5%	306.17	36.7%	<7.43	ND	269.02	6.6%
XRF Duplicate	P_20211103_98052_260	BPSOU-UR01SS05-110321-2-D	BPSOU-UR01SS05-110321-2	11/3/2021	8.86	ND	<7.63	ND	69.82	12.1%	52.88	119.9%	<6.99	ND	262.45	9.1%
Natural	P_20211103_98052_274	BPSOU-UR01SS06-110321-3		11/3/2021	<5.84		<7.74		66.72		21.19		<6.45		112.25	
XRF Replicate	P_20211103_98052_275	BPSOU-UR01SS06-110321-3-R	BPSOU-UR01SS06-110321-3	11/3/2021	9.33	ND	<7.63	ND	61.34	8.4%	18.57	13.2%	<6.57	ND	119.85	6.6%
XRF Duplicate	P_20211103_98052_276	BPSOU-UR01SS06-110321-3-D	BPSOU-UR01SS06-110321-3	11/3/2021	<5.82	ND	<7.55	ND	68.65	2.9%	23.30	9.5%	<6.58	ND	134.45	18.0%

Notes:

< - Not detected value is the XRF error for analysis.

Abbreviations:

mg/kg - milligram per kilogram

ND = non-detected

RPD = relative percent differnce

Attachment 1
Data Validation Checklists

Attachment 1.1
Data Validation Checklists for XRF Analyses

Data Validation Checklist XRF Sample Analysis

Site: Butte Priority Soils Operable Unit
Project: Unreclaimed Sites 2021
Sample Date: 11/2/2021
Data Validator: Josie McElroy

Case No: P_20211102
Sample Matrix: Soil
Analysis Dates: 11/2/2021
Validation Dates: 12/13/2021

Laboratory: Pioneer Technical Services, Inc.
Analyses: Arsenic; Cadmium; Copper; Lead; Mercury; Zinc

1. Holding Times

Analyte	Laboratory	Matrix	Method	Holding Times	Collection Date	Analysis Date(s)	Holding Time Met (Y/N)	Affected Data Flagged (Y/N)
As, Cd, Cu, Pb, Hg, Zn	Pioneer	Soil	XRF	N/A	11/2/2021	11/2/2021	N/A	N/A

Were any data flagged because of holding time? Y [ ] N [X]

What sample preparation steps were performed (i.e. drying, sieving etc.)? Drying and sieving

Were the samples prepped according to the SAP/QAPP? Y [X] N [ ]

Describe Any Actions Taken: None required

Comments:

2. Energy Calibration (System Check)

Was the energy calibration performed at the frequency of once per day?	Y	[X]	N	[ ]
Was the energy calibration Resolution below 195?	Y	[X]	N	[ ]
Did the energy calibration run for at least 50 seconds?	Y	[X]	N	[ ]

Describe Any Actions Taken: None required

Comments:

3. SiO_2 Standards

Was the SiO_2 Standard analyzed at the beginning of analysis?	Y	[X]	N	[ ]
Was the SiO_2 Standard analyzed at the frequency of 1 per 20 samples?	Y	[X]	N	[ ]
Were the SiO_2 Standard results within the control limits?	Y	[X]	N	[ ]
Were any data flagged because of the SiO_2 Standard results?	Y	[ ]	N	[X]

Describe Any Actions Taken: None required

Comments:

4. Calibration Check Samples

Were the appropriate Calibration Check Samples (CCS) analyzed at the beginning of analysis?	Y	[X]	N	[ ]
Were the appropriate CCS analyzed at the frequency of 1 per 20 natural samples?	Y	[X]	N	[ ]
Were CCS results within the control limits?	Y	[X]	N	[ ]
Were any data flagged because of CCS problems?	Y	[X]	N	[ ]

Describe Any Actions Taken: There were no calibration check samples that had a known amount (true value) of mercury greater than the limit of detection (LOD). Therefore, all mercury results have been qualified "UJ".

Comments:

5. Duplicate Sample Results

Were Duplicate Samples analyzed at the frequency of 1 per 20 natural samples?	Y	X	N	
Were Duplicate Sample results within the control window?	Y	X	N	
Were any data flagged because of duplicate sample results?	Y		N	X

Describe Any Actions Taken: None required

Comments: The following XRF duplicate sample was analyzed on 11/2/2021:

XRF Duplicate Sample	Primary Sample
BPSOU-UR01SS22-110221-1-D	BPSOU-UR01SS22-110221-1

The following XRF field duplicate sample was analyzed on 11/2/2021:

XRF Field Duplicate Sample	Primary Sample
BPSOU-UR01SS25-110221-1-FD	BPSOU-UR01SS25-110221-1

6. Replicate Sample Results

Were Replicate Samples analyzed at the frequency of 1 per 20 natural samples?	Y	X	N	
Were replicate sample results within the control window?	Y	X	N	
Were any data flagged because of replicate sample results?	Y		N	X

Describe Any Actions Taken: None required

Comments: The following XRF replicate sample was analyzed on 11/2/2021:

XRF Replicate Sample	Primary Sample
BPSOU-UR01SS22-110221-1-R	BPSOU-UR01SS22-110221-1

7. Overall Assessment

Are there analytical limitations of the data that users should be aware of?	Y	X	N	

If so, explain: On this WO P_20211102, the following qualifications were made:

Nineteen (19) mercury results have been qualified "UJ" due to the lack of an appropriate calibration check sample.

Comments:

8. Authorization of Data Validation

Data Validator
Name: Josie McElroy

Signature: Josie McElroy **Date:** 12/13/2021

Reviewed by: Sara Ward **Date**: 12/20/2021

Data Validation Checklist XRF Sample Analysis

Site: Butte Priority Soils Operable Unit
Project: Unreclaimed Sites 2021
Sample Date: 11/2/2021, 11/3/2021
Data Validator: Josie McElroy

Case No: P_20211103
Sample Matrix: Soil
Analysis Dates: 11/3/2021
Validation Dates: 12/13/2021

Laboratory: Pioneer Technical Services, Inc.
Analyses: Arsenic; Cadmium; Copper; Lead; Mercury; Zinc

1. Holding Times

Analyte	Laboratory	Matrix	Method	Holding Times	Collection Date	Analysis Date(s)	Holding Time Met (Y/N)	Affected Data Flagged (Y/N)
As, Cd, Cu, Pb, Hg, Zn	Pioneer	Soil	XRF	N/A	11/2/2021, 11/3/2021	11/3/2021	N/A	N/A

Were any data flagged because of holding time? Y [ ] N [X]

What sample preparation steps were performed (i.e. drying, sieving etc.)? Drying and sieving

Were the samples prepped according to the SAP/QAPP? Y [X] N [ ]

Describe Any Actions Taken: None required

Comments:

2. Energy Calibration (System Check)

Was the energy calibration performed at the frequency of once per day?	Y	X	N	
Was the energy calibration Resolution below 195?	Y	X	N	
Did the energy calibration run for at least 50 seconds?	Y	X	N	

Describe Any Actions Taken: None required

Comments:

3. SiO_2 Standards

Was the SiO_2 Standard analyzed at the beginning of analysis?	Y	X	N	
Was the SiO_2 Standard analyzed at the frequency of 1 per 20 samples?	Y	X	N	
Were the SiO_2 Standard results within the control limits?	Y	X	N	
Were any data flagged because of the SiO_2 Standard results?	Y		N	X

Describe Any Actions Taken: None required

Comments:

4. Calibration Check Samples

Were the appropriate Calibration Check Samples (CCS) analyzed at the beginning of analysis?	Y	X	N	
Were the appropriate CCS analyzed at the frequency of 1 per 20 natural samples?	Y	X	N	
Were CCS results within the control limits?	Y	X	N	
Were any data flagged because of CCS problems?	Y	X	N	

Describe Any Actions Taken: There were no calibration check samples that had a known amount (true value) of mercury greater than the limit of detection (LOD). Therefore, all mercury results have been qualified "UJ".

Comments:

5. Duplicate Sample Results

Were Duplicate Samples analyzed at the frequency of 1 per 20 natural samples?	Y	X	N	
Were Duplicate Sample results within the control window?	Y		N	X
Were any data flagged because of duplicate sample results?	Y	X	N	

Describe Any Actions Taken: The following XRF duplicate samples were analyzed on 11/3/2021:

XRF Duplicate Sample	Primary Sample
BPSOU-UR01SS15-110221-2-D	BPSOU-UR01SS15-110221-2
BPSOU-UR01SS13-110221-3-D	BPSOU-UR01SS13-110221-3
BPSOU-UR01SS05-110321-2-D	BPSOU-UR01SS05-110321-2

For the BPSOU-UR01SS15-110221-2-D and BPSOU-UR01SS15-110221-2 duplicate pair, the RPD for lead (78%) was outside control limits (35%). BPSOU-UR01SS15-110221-2 was qualified "J" for lead.

For the BPSOU-UR01SS13-110221-3-D and BPSOU-UR01SS13-110221-3 duplicate pair, the RPD for arsenic (67%) was outside control limits (35%). BPSOU-UR01SS13-110221-3 was qualified "J" for arsenic.

For the BPSOU-UR01SS05-110321-2-D and BPSOU-UR01SS05-110321-2 duplicate pair, the RPD for lead (120%) was outside control limits (35%). BPSOU-UR01SS05-110321-2 was qualified "J" for lead.

The following XRF field duplicate sample was analyzed on 11/3/2021:

XRF Field Duplicate Sample	Primary Sample
BPSOU-UR01SS07-110321-1-FD	BPSOU-UR01SS07-110321-1

For the BPSOU-UR01SS07-110321-1-FD and BPSOU-UR01SS07-110321-1 duplicate pair, the RPD for lead (50%) was outside control limits (35%). BPSOU-UR01SS07-110321-1-FD and BPSOU-UR01SS07-110321-1 were qualified "J" for lead.

Comments: The following XRF duplicate sample was also analyzed on 11/3/2021:

XRF Duplicate Sample	Primary Sample
BPSOU-UR01SS06-110321-3-D	BPSOU-UR01SS06-110321-3

The following XRF field duplicate samples were also analyzed on 11/3/2021:

XRF Field Duplicate Sample	Primary Sample
BPSOU-UR01SS01-110321-3-FD	BPSOU-UR01SS01-110321-3
BPSOU-UR01SS02-110321-2-FD	BPSOU-UR01SS02-110321-2
BPSOU-UR01SS06-110321-1-FD	BPSOU-UR01SS06-110321-1

6. Replicate Sample Results

Were Replicate Samples analyzed at the frequency of 1 per 20 natural samples?	Y	X	N	
Were replicate sample results within the control window?	Y		N	X
Were any data flagged because of replicate sample results?	Y	X	N	

Describe Any Actions Taken: The following XRF replicate sample was analyzed on 11/3/2021:

XRF Replicate Sample	Primary Sample
BPSOU-UR01SS13-110221-3-R	BPSOU-UR01SS13-110221-3
BPSOU-UR01SS05-110321-2-R	BPSOU-UR01SS05-110321-2

For the BPSOU-UR01SS13-110221-3-R and BPSOU-UR01SS13-110221-3 duplicate pair, the RPD for arsenic (44%) was outside control limits (35%). BPSOU-UR01SS13-110221-3 was qualified "J" for arsenic. The arsenic result for BPSOU-UR01SS13-110221-3 was previously qualified "J" due to the RPD of the XRF duplicate sample being outside the control limits; therefore, the final qualifications will be "J".

For the BPSOU-UR01SS05-110321-2-R and BPSOU-UR01SS05-110321-2 duplicate pair, the RPD for lead (37%) was outside control limits (35%). BPSOU-UR01SS05-110321-2 was qualified "J" for lead. The lead results for BPSOU-UR01SS05-110321-2 were previously qualified "J" due to the RPD of the XRF duplicate sample being outside the control limits; therefore, the final qualification will be "J" for lead.

Comments: The following XRF replicate sample was also analyzed on 11/3/2021:

XRF Replicate Sample	Primary Sample
BPSOU-UR01SS15-110221-2-R	BPSOU-UR01SS15-110221-2
BPSOU-UR01SS06-110321-3-R	BPSOU-UR01SS06-110321-3

7. Overall Assessment

Are there analytical limitations of the data that users should be aware of? Y [X] N [ ]

If so, explain: On this WO P_20211103, the following qualifications were made:

One (1) arsenic result was qualified "J" due to elevated XRF duplicate and replicate RPDs.
One (1) lead result was qualified "J" due to an elevated XRF duplicate RPD.
One (1) lead result was qualified "J" due to elevated XRF duplicate and replicate RPDs.
Two (2) lead results were qualified "J" due to an elevated XRF field duplicate RPD.
Sixty-two (62) mercury results have been qualified "UJ" due to the lack of an appropriate calibration check sample.

Comments:

8. Authorization of Data Validation

Data Validator
Name: Sara Ward

Signature: Josie McElroy **Date:** 12/13/2021

Reviewed by: Sara Ward **Date**: 12/20/2021

Attachment 1.2
Data Validation Checklists for Laboratory Analyses

Stage 2A Data Validation Checklist for Sample Analysis

Site: Butte Priority Soils Operable Unit
Project: Unreclaimed Sites 2021
Sample Date(s): 11/02/2021
Data Validator: Sara Ward

Case No: 10586267
Sample Matrix: Soil
Analysis Date(s): 11/08/2021, 11/15/2021, 11/16/2021
Validation Date(s): 11/29/2021

Laboratory: Pace Analytical
Analyses: As, Cd, Cu, Pb, Zn (EPA 6010D), Hg (EPA 7471B), and Percent Moisture (ASTM D2974)

1. Holding Times

Analyte	Laboratory	Matrix	Method	Holding Times	Collection Date(s):	Analysis Date(s)	Holding Time Met (Y/N)	Affected Data Flagged (Y/N)
As, Cd, Cu, Pb, and Zn	Pace	Soil	EPA 6010D	6 months	11/02/2021	11/15/2021	Y	N/A
Hg			EPA 7471B	28 days		11/16/2021	Y	N/A
Percent Moisture			ASTM D2974	N/A		11/08/2021	Y	N/A

Were any data flagged because of holding time? Y [ ] N [X]
Were any data flagged because of preservation problems? Y [ ] N [X]

Describe Any Actions Taken: None Required.

Comments: The receiving temperature as reported by the laboratory was 1.4°C. The samples were shipped on ice and analyzed within holding time.

2. Blanks

Were Method Blanks (MBs) analyzed at the frequency of 1 per analytical batch? Y [X] N [ ]
Were MBs within the control window? Y [X] N [ ]
Were any data flagged because of blank problems? Y [ ] N [X]

Describe Any Actions Taken: None Required.

Comments: MBs for EPA 7471B and EPA 6010D were non-detect. A MB was not analyzed for ASTM D2974.

3. Laboratory Control Samples

Were Laboratory Control Samples (LCS) analyzed at the frequency of 1 per batch? Y [X] N [ ]
Were LCS results within the control window? Y [X] N [ ]
Were any data flagged because of LCS problems? Y [ ] N [X]

Describe Any Actions Taken: None Required.

Comments: The LCS %R were within limits for EPA 6010D and EPA 7471B. An LCS was not analyzed for ASTM D2974.

4. Duplicate Sample Results

Were Laboratory Duplicate Samples (LDS) analyzed at the frequency of 1 per batch? Y [X] N [ ]
Were LDS results within the control window? Y [X] N [ ]
Were any data flagged because of LDS problems? Y [ ] N [X]

Describe Any Actions Taken: None Required.

Comments: For method EPA 7471B batch 781724, an LMS/LMS Duplicate (LMSD) generated from BPSOU-UR01SS27-110221-3 was used for the LDS calculation. The RPD was within control limits.

For method EPA 6010D batch 781719, an LMS/LMS Duplicate (LMSD) generated from BPSOU-UR01SS27-110221-3 was used for the LDS calculations. The RPDs were within control limits.

For ASTM D2974, a duplicate generated from BPSOU-UR01SS27-110221-3 and a duplicate generated from BPSOU-UR01SS22-110221-2 were used for the LDS calculations. The RPDs were within control limits.

Work Order: 10586267

5. Matrix Spike Sample Results

Were Laboratory Matrix Spike Samples (LMS) analyzed at the frequency of 1 per batch?	Y	X	N	
Were LMS results within the control window?	Y		N	X
Were any data flagged because of LMS problems?	Y	X	N	

Describe Any Actions Taken: For method EPA 7471B batch 781724, an LMS/LMSD was generated from BPSOU-UR01SS27-110221-3. The %R of the LMS/LMSD for mercury (55% and 66%, respectively) were outside control limits (80-120%); therefore, BPSOU-UR01SS27-110221-3 was qualified "J-" for mercury. Per the NFG, "*For a spike sample analysis that does not meet the technical criteria, apply the action to all samples of the same matrix if the samples are considered sufficiently similar"* (EPA, 2017). No sample were considered sufficiently similar; therefore, no additional qualifications were warranted.

For method EPA 6010D batch 781719, an LMS/LMSD was generated from BPSOU-UR01SS27-110221-3. The %R of the LMSD for lead (71%) and the LMS/LMSD for zinc (49% and 58%, respectively) were outside control limits (75-125%); therefore, BPSOU-UR01SS27-110221-3 was qualified "J-" for lead and zinc. Per the NFG, "*For a spike sample analysis that does not meet the technical criteria, apply the action to all samples of the same matrix if the samples are considered sufficiently similar"* (EPA, 2017). No sample were considered sufficiently similar; therefore, no additional qualifications were warranted. The remaining %R were within control limits.

Comments: An LMS was not analyzed for ASTM D2974.

6. Field Blanks

Were field blanks submitted as specified in the QAPP?	Y		N		N/A	X
Were field blanks within the control window?	Y		N		N/A	X
Were any data qualified because of field blank problems?	Y		N		N/A	X

Describe Any Actions Taken: None Required.

Comments: Field blanks were not required as there is no sampling equipment re-used.

7. Field Duplicates

Were field duplicates submitted as specified in the QAPP?	Y	X	N		N/A	
Were results for field duplicates within the control window?	Y		N	X	N/A	
Were any data qualified because of field duplicate problems?	Y	X	N		N/A	

Describe Any Actions Taken: One field duplicate pair was submitted on this work order, BPSOU-UR01SS25-110221-1 and BPSOU-UR01SS25-110221-1-FD. The arsenic results for the duplicate sample were less than 5 times the reporting limit, but the absolute difference between the natural sample and field duplicate was greater than the reporting limit. The arsenic results for BPSOU-UR01SS25-110221-1 and BPSOU-UR01SS25-110221-1-FD were qualified "J". Per the NFG, "*For a duplicate sample analysis that does not meet the technical criteria, apply the action to all samples of the same matrix if the samples are considered sufficiently similar"* (EPA, 2017). No samples were considered sufficiently similar; therefore, no additional qualifications were warranted.

Comments: The precision for all remaining analytes was within control limits.

8. Overall Assessment

Are there analytical limitations of the data that users should be aware of? Y [X] N [ ]

If so, explain: On this WO 10586267, the following qualifications were made:

In addition to the qualifications outlined in the sections above, results which were reported between the method detection limit (MDL) and the reporting limit (RL) were qualified "A" when no additional qualifications were warranted.

The table below lists the qualifications on the natural samples:

Field ID	**Analyte**	Final Qualification	Reason Code
BPSOU-UR01SS27-110221-3	Lead	J-	S%
BPSOU-UR01SS27-110221-3	Zinc	J-	S%
BPSOU-UR01SS25-110221-1	Arsenic	J	FD
BPSOU-UR01SS21-110221-3	Cadmium	A	<RL
BPSOU-UR01SS27-110221-3	Mercury	J-	S%

The table below lists the qualifications on the field quality control samples:

Field ID	**Analyte**	Final Qualification	Reason Code
BPSOU-UR01SS25-110221-1-FD	Arsenic	J	FD

Reason for qualification:
S% = Matrix Spike
FD = Field Duplicate
<RL = The result is above the method detection limit and below the reporting limit.

Comments:

9. Authorization of Data Validation

Data Validator

Name: Sara Ward **Reviewed by:** Josie McElroy

Signature: Sara Ward Josie McElroy

Date: 11/29/2021 11/30/2021

Stage 2A Data Validation Checklist for Sample Analysis

Site: Butte Priority Soils Operable Unit
Project: Unreclaimed Sites 2021
Sample Date(s): 11/02/2021, 11/03/2021
Data Validator: Sara Ward
Case No: 10586277
Sample Matrix: Soil
Analysis Date(s): 11/08/2021, 11/15/2021, 11/16/2021
Validation Date(s): 11/29/2021
Laboratory: Pace Analytical
Analyses: As, Cd, Cu, Pb, Zn (EPA 6010D), Hg (EPA 7471B), and Percent Moisture (ASTM D2974)

1. Holding Times

Analyte	Laboratory	Matrix	Method	Holding Times	Collection Date(s):	Analysis Date(s)	Holding Time Met (Y/N)	Affected Data Flagged (Y/N)
As, Cd, Cu, Pb, and Zn	Pace	Soil	EPA 6010D	6 months	11/02/2021, 11/03/2021	11/15/2021	Y	N/A
Hg			EPA 7471B	28 days		11/16/2021	Y	N/A
Percent Moisture			ASTM D2974	N/A		11/08/2021	Y	N/A

Were any data flagged because of holding time? Y [ ] N [X]
Were any data flagged because of preservation problems? Y [ ] N [X]

Describe Any Actions Taken: None Required.

Comments: The receiving temperature as reported by the laboratory was 1.4°C. The samples were shipped on ice and analyzed within holding time.

2. Blanks

Were Method Blanks (MBs) analyzed at the frequency of 1 per analytical batch? Y [X] N [ ]
Were MBs within the control window? Y [X] N [ ]
Were any data flagged because of blank problems? Y [ ] N [X]

Describe Any Actions Taken: None Required.

Comments: MBs for EPA 7471B and EPA 6010D were non-detect. A MB was not analyzed for ASTM D2974.

3. Laboratory Control Samples

Were Laboratory Control Samples (LCS) analyzed at the frequency of 1 per batch? Y [X] N [ ]
Were LCS results within the control window? Y [X] N [ ]
Were any data flagged because of LCS problems? Y [ ] N [X]

Describe Any Actions Taken: None Required.

Comments: The LCS %R were within limits for EPA 6010D and EPA 7471B. An LCS was not analyzed for ASTM D2974.

4. Duplicate Sample Results

Were Laboratory Duplicate Samples (LDS) analyzed at the frequency of 1 per batch? Y [X] N [ ]
Were LDS results within the control window? Y [ ] N [X]
Were any data flagged because of LDS problems? Y [X] N [ ]

Describe Any Actions Taken: For method EPA 7471B batch 782131, an LMS/LMS Duplicate (LMSD) generated from BPSOU-UR01SS19-110221-1 was used for the LDS calculation. The RPD (58%) was outside control limits (20%). The mercury results for BPSOU-UR01SS19-110221-1 were qualified "J". Per the NFG, "*For a duplicate sample analysis that does not meet the technical criteria, apply the action to all samples of the same matrix if the samples are considered sufficiently similar"* (EPA, 2017). No samples are considered sufficiently similar; therefore, no additional qualifications were warranted.

Comments: For method EPA 7471B batch 784057, an LMS/LMSD generated from BPSOU-UR01SS01-110321-3 was used for the LDS calculation. The RPD was within control limits.

For method EPA 6010D batch 782084, an LMS/LMSD generated from BPSOU-UR01SS19-110221-1 was used for the LDS calculations. The RPDs were within control limits.

For ASTM D2974, a duplicate generated from BPSOU-UR01SS19-110221-1 and a duplicate generated from BPSOU-UR01SS15-110221-3 were used for the LDS calculations. The RPDs were within control limits.

Work Order: 10586277

5. Matrix Spike Sample Results

Were Laboratory Matrix Spike Samples (LMS) analyzed at the frequency of 1 per batch?	Y	X	N	
Were LMS results within the control window?	Y		N	X
Were any data flagged because of LMS problems?	Y	X	N	

Describe Any Actions Taken: For method EPA 7471B batch 782131, an LMS/LMSD was generated from BPSOU-UR01SS19-110221-1. The %R of the LMSD for mercury (49%) was outside control limits (80-120%); therefore, BPSOU-UR01SS19-110221-1 was qualified "J-" for mercury. Per the NFG, "*For a spike sample analysis that does not meet the technical criteria, apply the action to all samples of the same matrix if the samples are considered sufficiently similar"* (EPA, 2017). No sample were considered sufficiently similar; therefore, no additional qualifications were warranted. The mercury results had a previous qualification of "J" due to an elevated duplicate RPD; therefore, the final qualification is "J".

For method EPA 6010D batch 782084, an LMS/LMSD was generated from BPSOU-UR01SS19-110221-1. The %R of the LMS/LMSD for lead (74% and 66%, respectively) and zinc (60% and 55%, respectively) were outside control limits (75-125%); therefore, BPSOU-UR01SS19-110221-1 was qualified "J-" for lead and zinc. Per the NFG, "*For a spike sample analysis that does not meet the technical criteria, apply the action to all samples of the same matrix if the samples are considered sufficiently similar"* (EPA, 2017). No sample were considered sufficiently similar; therefore, no additional qualifications were warranted. The remaining %R were within control limits.

Comments: For method SW7471B batch 784057, an LMS/LMSD was generated from BPSOU-UR01SS01-110321-3. The %R of the LMS/LMSD for mercury were within control limits (80-120%).

An LMS was not analyzed for ASTM D2974.

6. Field Blanks

Were field blanks submitted as specified in the QAPP?	Y		N		N/A	X
Were field blanks within the control window?	Y		N		N/A	X
Were any data qualified because of field blank problems?	Y		N		N/A	X

Describe Any Actions Taken: None Required.

Comments: Field blanks were not required as there is no sampling equipment re-used.

7. Field Duplicates

Were field duplicates submitted as specified in the QAPP?	Y	X	N		N/A	
Were results for field duplicates within the control window?	Y	X	N		N/A	
Were any data qualified because of field duplicate problems?	Y		N	X	N/A	

Describe Any Actions Taken: None Required.

Comments: One field duplicate pair was submitted on this work order, BPSOU-UR01SS01-110321-3 and BPSOU-UR01SS01-110321-3-FD. The precision for all analytes was within control limits.

8. Overall Assessment

Are there analytical limitations of the data that users should be aware of? Y [X] N [ ]

If so, explain: On this WO 10586277, the following qualifications were made:

In addition to the qualifications outlined in the sections above, results which were reported between the method detection limit (MDL) and the reporting limit (RL) were qualified "A" when no additional qualifications were warranted.

The table below lists the qualifications on the natural samples:

Field ID	**Analyte**	Final Qualification	Reason Code
BPSOU-UR01SS19-110221-1	Lead	J-	S%
BPSOU-UR01SS19-110221-1	Zinc	J-	S%
BPSOU-UR01SS19-110221-1	Mercury	J	S%, D%
BPSOU-UR01SS01-110321-3	Mercury	A	<RL

The table below lists the qualifications on the field quality control samples:

Field ID	**Analyte**	Final Qualification	Reason Code
BPSOU-UR01SS01-110321-3-FD	Mercury	A	<RL

Reason for qualification:
S% = Matrix Spike
D% = Laboratory Duplicate Sample
<RL = The result is above the method detection limit and below the reporting limit.

Comments:

9. Authorization of Data Validation

Data Validator

Name: Sara Ward **Reviewed by:** Josie McElroy

Signature: Sara Ward Josie McElroy

Date: 11/30/2021 11/30/2021

Stage 2A Data Validation Checklist for Sample Analysis

Site: Butte Priority Soils Operable Unit
Project: Unreclaimed Sites 2021
Sample Date(s): 11/02/2021, 11/03/2021
Data Validator: Sara Ward

Case No: 10586396
Sample Matrix: Soil
Analysis Date(s): 11/08/2021, 11/15/2021, 11/16/2021
Validation Date(s): 11/30/2021

Laboratory: Pace Analytical
Analyses: As, Cd, Cu, Pb, Zn (EPA 6010D), Hg (EPA 7471B), and Percent Moisture (ASTM D2974)

1. Holding Times

Analyte	Laboratory	Matrix	Method	Holding Times	Collection Date(s):	Analysis Date(s)	Holding Time Met (Y/N)	Affected Data Flagged (Y/N)
As, Cd, Cu, Pb, and Zn	Pace	Soil	SW6010D	6 months	11/02/2021, 11/03/2021	11/15/2021	Y	N/A
Hg			SW7471B	28 days		11/16/2021	Y	N/A
Percent Moisture			ASTM D2974	N/A		11/08/2021	Y	N/A

Were any data flagged because of holding time? Y [ ] N [X]
Were any data flagged because of preservation problems? Y [ ] N [X]

Describe Any Actions Taken: None Required.

Comments: The receiving temperature as reported by the laboratory was 2.8°C. The samples were shipped on ice and analyzed within holding time.

2. Blanks

Were Method Blanks (MBs) analyzed at the frequency of 1 per analytical batch? Y [X] N [ ]
Were MBs within the control window? Y [X] N [ ]
Were any data flagged because of blank problems? Y [ ] N [X]

Describe Any Actions Taken: None Required.

Comments: MBs for EPA 7471B and EPA 6010D were non-detect. A MB was not analyzed for ASTM D2974.

3. Laboratory Control Samples

Were Laboratory Control Samples (LCS) analyzed at the frequency of 1 per batch? Y [X] N [ ]
Were LCS results within the control window? Y [X] N [ ]
Were any data flagged because of LCS problems? Y [ ] N [X]

Describe Any Actions Taken: None Required.

Comments: The LCS %R were within limits for EPA 6010D and EPA 7471B. An LCS was not analyzed for ASTM D2974.

4. Duplicate Sample Results

Were Laboratory Duplicate Samples (LDS) analyzed at the frequency of 1 per batch? Y [X] N [ ]
Were LDS results within the control window? Y [X] N [ ]
Were any data flagged because of LDS problems? Y [ ] N [X]

Describe Any Actions Taken: None Required.

Comments: For method EPA 7471B batch 782132, an LMS/LMS Duplicate (LMSD) generated from BPSOU-UR01SS13-110221-1 was used for the LDS calculation. The RPD was within control limits.

For method EPA 6010D batch 782085, an LMS/LMS Duplicate (LMSD) generated from BPSOU-UR01SS13-110221-1 was used for the LDS calculations. The RPDs were within control limits.

For ASTM D2974, a duplicate generated from BPSOU-UR01SS13-110221-1 and a duplicate generated from BPSOU-UR01SS08-110221-3 were used for the LDS calculations. The RPDs were within control limits.

Work Order: 10586396

5. Matrix Spike Sample Results

Were Laboratory Matrix Spike Samples (LMS) analyzed at the frequency of 1 per batch?	Y	X	N			
Were LMS results within the control window?	Y		N	X		
Were any data flagged because of LMS problems?	Y	X	N			

Describe Any Actions Taken: For method EPA 7471B batch 782132, an LMS/LMSD was generated from BPSOU-UR01SS13-110221-1. The %R of the LMSD for mercury (71%) was outside control limits (80-120%); therefore, BPSOU-UR01SS13-110221-1 was qualified "J-" for mercury. Per the NFG, "*For a spike sample analysis that does not meet the technical criteria, apply the action to all samples of the same matrix if the samples are considered sufficiently similar"* (EPA, 2017). No sample were considered sufficiently similar; therefore, no additional qualifications were warranted.

Comments: For method EPA 6010D batch 782085, an LMS/LMSD was generated from BPSOU-UR01SS13-110221-1. The %R of the LMS/LMSD were within control limits (75-125%).

An LMS was not analyzed for ASTM D2974.

6. Field Blanks

Were field blanks submitted as specified in the QAPP?	Y		N		N/A	X
Were field blanks within the control window?	Y		N		N/A	X
Were any data qualified because of field blank problems?	Y		N		N/A	X

Describe Any Actions Taken: None Required.

Comments: Field blanks were not required as there is no sampling equipment re-used.

7. Field Duplicates

Were field duplicates submitted as specified in the QAPP?	Y	X	N		N/A	
Were results for field duplicates within the control window?	Y		N	X	N/A	
Were any data qualified because of field duplicate problems?	Y	X	N		N/A	

Describe Any Actions Taken: One field duplicate pair was submitted on this work order, BPSOU-UR01SS02-110321-2 and BPSOU-UR01SS02-110321-2-FD. The lead results for the natural sample and field duplicate were greater than 5 times the reporting limit, but the RPD was greater than 35%. The lead results for BPSOU-UR01SS02-110321-2 and BPSOU-UR01SS02-110321-2-FD were qualified "J". Per the NFG, "*For a duplicate sample analysis that does not meet the technical criteria, apply the action to all samples of the same matrix if the samples are considered sufficiently similar"* (EPA, 2017). No samples were considered sufficiently similar; therefore, no additional qualifications were warranted.

Comments: The precision for all remaining analytes was within control limits.

8. Overall Assessment

Are there analytical limitations of the data that users should be aware of? Y [X] N [ ]

If so, explain: On this WO 10586396, the following qualifications were made:

In addition to the qualifications outlined in the sections above, results which were reported between the method detection limit (MDL) and the reporting limit (RL) were qualified "A" when no additional qualifications were warranted.

The table below lists the qualifications on the natural samples:

Field ID	**Analyte**	Final Qualification	Reason Code
BPSOU-UR01SS02-110321-2	Lead	J	FD
BPSOU-UR01SS13-110221-2	Cadmium	A	<RL
BPSOU-UR01SS08-110221-1	Cadmium	A	<RL
BPSOU-UR01SS08-110221-2	Cadmium	A	<RL
BPSOU-UR01SS02-110321-2	Cadmium	A	<RL
BPSOU-UR01SS13-110221-1	Mercury	J-	S%
BPSOU-UR01SS13-110221-2	Mercury	A	<RL
BPSOU-UR01SS13-110221-3	Mercury	A	<RL
BPSOU-UR01SS12-110221-2	Mercury	A	<RL
BPSOU-UR01SS08-110221-3	Mercury	A	<RL
BPSOU-UR01SS02-110321-2	Mercury	A	<RL

The table below lists the qualifications on the field quality control samples:

Field ID	**Analyte**	Final Qualification	Reason Code
BPSOU-UR01SS02-110321-2-FD	Lead	J	FD
BPSOU-UR01SS02-110321-2-FD	Cadmium	A	<RL

Reason for qualification:
FD = Field Duplicate
S% = Matrix Spike
<RL = The result is above the method detection limit and below the reporting limit.

Comments:

9. Authorization of Data Validation

Data Validator

Name: Sara Ward **Reviewed by:** Josie McElroy

Signature: Sara Ward Josie McElroy

Date: 11/30/2021 11/30/2021

Stage 2A Data Validation Checklist for Sample Analysis

Site: Butte Priority Soils Operable Unit
Project: Unreclaimed Sites 2021
Sample Date(s): 11/03/2021
Data Validator: Sara Ward
Case No: 10587272
Sample Matrix: Soil
Analysis Date(s): 11/12/2021, 11/17/2021, 11/18/2021, 11/21/2021
Validation Date(s): 11/30/2021
Laboratory: Pace Analytical
Analyses: As, Cd, Cu, Pb, Zn (EPA 6010D), Hg (EPA 7471B), and Percent Moisture (ASTM D2974)

1. Holding Times

Analyte	Laboratory	Matrix	Method	Holding Times	Collection Date(s):	Analysis Date(s)	Holding Time Met (Y/N)	Affected Data Flagged (Y/N)
As, Cd, Cu, Pb, and Zn	Pace	Soil	EPA 6010D	6 months	11/03/2021	11/17/2021	Y	N/A
Hg			EPA 7471B	28 days		11/18/2021, 11/21/2021	Y	N/A
Percent Moisture			ASTM D2974	N/A		11/12/2021	Y	N/A

Were any data flagged because of holding time? Y [ ] N [X]
Were any data flagged because of preservation problems? Y [X] N [ ]

Describe Any Actions Taken:

The receiving temperature as reported by the laboratory was 8.4°C. Since the receiving temperature was greater than 6.0°C, the mercury results were qualified "UJ/J-". The samples were shipped on ice and analyzed within holding time.

Sample ID	Mercury Results (mg/kg)	Qualifier
BPSOU-UR01SS03-110321-1	ND	UJ
BPSOU-UR01SS03-110321-2	ND	UJ
BPSOU-UR01SS03-110321-3	ND	UJ
BPSOU-UR01SS04-110321-1	ND	UJ
BPSOU-UR01SS04-110321-2	ND	UJ
BPSOU-UR01SS04-110321-3	ND	UJ
BPSOU-UR01SS05-110321-1	0.24	J-
BPSOU-UR01SS05-110321-2	0.35	J-
BPSOU-UR01SS05-110321-3	0.84	J-
BPSOU-UR01SS06-110321-1	0.016	J-
BPSOU-UR01SS06-110321-1-FD	0.017	J-
BPSOU-UR01SS06-110321-2	0.022	J-
BPSOU-UR01SS07-110321-1	0.013	J-
BPSOU-UR01SS07-110321-2	ND	UJ

Comments:

2. Blanks

Were Method Blanks (MBs) analyzed at the frequency of 1 per analytical batch? Y [X] N [ ]
Were MBs within the control window? Y [X] N [ ]
Were any data flagged because of blank problems? Y [ ] N [X]

Describe Any Actions Taken: None Required.

Comments: MBs for EPA 7471B and EPA 6010D were non-detect. A MB was not analyzed for ASTM D2974.

3. Laboratory Control Samples

Were Laboratory Control Samples (LCS) analyzed at the frequency of 1 per batch? Y [X] N [ ]
Were LCS results within the control window? Y [X] N [ ]
Were any data flagged because of LCS problems? Y [ ] N [X]

Describe Any Actions Taken: None Required.

Comments: The LCS %R were within limits for EPA 6010D and EPA 7471B. An LCS was not analyzed for ASTM D2974.

Work Order: 10587272

4. Duplicate Sample Results

Were Laboratory Duplicate Samples (LDS) analyzed at the frequency of 1 per batch?	Y	X	N			
Were LDS results within the control window?	Y	X	N			
Were any data flagged because of LDS problems?	Y		N	X		

Describe Any Actions Taken: None Required.

Comments: For method EPA 7471B batch 783302, an LMS/LMS Duplicate (LMSD) generated from a sample not from this work order was used for the LDS calculation. The RPD was within control limits.

For method EPA 7471B batch 783306, an LMS/LMS Duplicate (LMSD) generated from BPSOU-UR01SS03-110321-1 was used for the LDS calculation. The RPD was within control limits.

For method EPA 6010D batch 783304, an LMS/LMS Duplicate (LMSD) generated from BPSOU-UR01SS03-110321-1 was used for the LDS calculations. The RPDs were within control limits.

For ASTM D2974, a duplicate generated from BPSOU-UR01SS03-110321-1 and a duplicate generated from a sample not from this work order were used for the LDS calculations. The RPDs were within control limits.

5. Matrix Spike Sample Results

Were Laboratory Matrix Spike Samples (LMS) analyzed at the frequency of 1 per batch?	Y	X	N			
Were LMS results within the control window?	Y		N	X		
Were any data flagged because of LMS problems?	Y	X	N			

Describe Any Actions Taken: For method EPA 7471B batch 783306, an LMS/LMSD was generated from BPSOU-UR01SS03-110321-1. The %R of the LMS/LMSD for mercury (78% and 76%, respectively) were outside control limits (80-120%). Mercury results for BPSOU-UR01SS03-110321-1 were qualified "UJ". Per the NFG, "*For a spike sample analysis that does not meet the technical criteria, apply the action to all samples of the same matrix if the samples are considered sufficiently similar"* (EPA, 2017). Since no samples are considered sufficiently similar, no additional qualifications were warranted. The sample had a previous qualification of "UJ" for mercury due to the sample receipt temperature outside the acceptable range; therefore, the final qualification was "UJ".

For method EPA 6010D batch 783304, an LMS/LMSD was generated from BPSOU-UR01SS03-110321-1. The %R of the LMSD for zinc (69%) was outside control limits (75-125%). Zinc results for BPSOU-UR01SS03-110321-1 were qualified "J-". Per the NFG, "*For a spike sample analysis that does not meet the technical criteria, apply the action to all samples of the same matrix if the samples are considered sufficiently similar"* (EPA, 2017). Since no samples are considered sufficiently similar, no additional qualifications were warranted. All other %R were within limits.

Comments: For method EPA 7471B batch 783302, an LMS/LMSD was generated from a sample not from this work order. The %R of the LMS/LMSD for mercury were within control limits (80-120%).

An LMS was not analyzed for ASTM D2974.

6. Field Blanks

Were field blanks submitted as specified in the QAPP?	Y		N		N/A	X
Were field blanks within the control window?	Y		N		N/A	X
Were any data qualified because of field blank problems?	Y		N		N/A	X

Describe Any Actions Taken: None Required.

Comments: Field blanks were not required as there is no sampling equipment re-used.

7. Field Duplicates

Were field duplicates submitted as specified in the QAPP?	Y	X	N		N/A	
Were results for field duplicates within the control window?	Y	X	N		N/A	
Were any data qualified because of field duplicate problems?	Y		N	X	N/A	

Describe Any Actions Taken: None Required.

Comments: One field duplicate pair was submitted on this work order, BPSOU-UR01SS06-110321-1 and BPSOU-UR01SS06-110321-1-FD. The precision for all analytes was within control limits.

8. Overall Assessment

Are there analytical limitations of the data that users should be aware of? Y [X] N [ ]

If so, explain: On this WO 10587272, the following qualifications were made:

In addition to the qualifications outlined in the sections above, results which were reported between the method detection limit and the reporting limit were qualified "A" when no additional qualifications were warranted.

The table below lists the qualifications on the natural samples:

Field ID	Analyte	Final Qualification	Reason Code
BPSOU-UR01SS03-110321-1	Mercury	UJ	Pres, S%
BPSOU-UR01SS03-110321-2	Mercury	UJ	Pres
BPSOU-UR01SS03-110321-3	Mercury	UJ	Pres
BPSOU-UR01SS04-110321-1	Mercury	UJ	Pres
BPSOU-UR01SS04-110321-2	Mercury	UJ	Pres
BPSOU-UR01SS04-110321-3	Mercury	UJ	Pres
BPSOU-UR01SS05-110321-1	Mercury	J-	Pres
BPSOU-UR01SS05-110321-2	Mercury	J-	Pres
BPSOU-UR01SS05-110321-3	Mercury	J-	Pres
BPSOU-UR01SS06-110321-1	Mercury	J-	Pres, <RL
BPSOU-UR01SS06-110321-2	Mercury	J-	Pres
BPSOU-UR01SS07-110321-1	Mercury	J-	Pres, <RL
BPSOU-UR01SS07-110321-2	Mercury	UJ	Pres
BPSOU-UR01SS03-110321-1	Zinc	J-	S%
BPSOU-UR01SS04-110321-2	Cadmium	A	<RL
BPSOU-UR01SS04-110321-3	Cadmium	A	<RL
BPSOU-UR01SS06-110321-1	Cadmium	A	<RL

The table below lists the qualifications on the field quality control samples:

Field ID	Analyte	Final Qualification	Reason Code
BPSOU-UR01SS06-110321-1-FD	Mercury	J-	Pres, <RL
BPSOU-UR01SS06-110321-1-FD	Cadmium	A	<RL

Reason for qualification:
Pres = The receipt temperature was outside of required range.
S% = Laboratory matrix spike recovery was outside control limits.
<RL = The result is above the method detection limit and below the reporting limit.

Comments:

9. Authorization of Data Validation

Data Validator
Name: Sara Ward **Reviewed by:** Josie McElroy

Signature: Sara Ward Josie McElroy

Date: 11/30/2021 12/1/2021

Stage 2A Data Validation Checklist for Sample Analysis

Site: Butte Priority Soils Operable Unit
Project: Unreclaimed Sites 2021
Sample Date(s): 11/03/2021, 11/04/2021
Data Validator: Sara Ward
Case No: 10587273
Sample Matrix: Soil
Analysis Date(s): 11/16/2021, 11/17/2021, 11/18/2021, 11/21/2021
Validation Date(s): 12/1/2021
Laboratory: Pace Analytical
Analyses: As, Cd, Cu, Pb, Zn (EPA 6010D), Hg (SW7471B), and Percent Moisture (ASTM D2974)

1. Holding Times

Analyte	Laboratory	Matrix	Method	Holding Times	Collection Date(s):	Analysis Date(s)	Holding Time Met (Y/N)	Affected Data Flagged (Y/N)
As, Cd, Cu, Pb, and Zn	Pace	Soil	EPA 6010D	6 months	11/03/2021, 11/04/2021	11/17/2021, 11/18/2021	Y	N/A
Hg			SW7471B	28 days		11/21/2021	Y	N/A
Percent Moisture			ASTM D2974	N/A		11/16/2021	Y	N/A

Were any data flagged because of holding time? Y [ ] N [X]
Were any data flagged because of preservation problems? Y [X] N [ ]

Describe Any Actions Taken:

The receiving temperature as reported by the laboratory was 8.4°C. Since the receiving temperature was greater than 6.0°C, the mercury results were qualified "UJ/J-". The samples were shipped on ice and analyzed within holding time.

Sample ID	Mercury Results (mg/kg)	Qualifier
BPSOU-UR05SS02-110421-1	0.25	J-
BPSOU-UR05SS02-110421-1-FD	0.20	J-
BPSOU-UR05SS02-110421-2	0.31	J-
BPSOU-UR05SS02-110421-3	0.26	J-
BPSOU-UR05SS03-110421-1	0.80	J-
BPSOU-UR05SS03-110421-2	0.45	J-
BPSOU-UR05SS03-110421-3	0.65	J-
BPSOU-UR05SS04-110421-1	0.15	J-
BPSOU-UR05SS04-110421-2	0.16	J-
BPSOU-UR05SS04-110421-3	0.26	J-
BPSOU-UR05SS05-110421-1	0.029	J-
BPSOU-UR05SS05-110421-2	0.038	J-
BPSOU-UR05SS05-110421-3	0.068	J-
BPSOU-UR01SS07-110321-3	ND	UJ

Comments:

2. Blanks

Were Method Blanks (MBs) analyzed at the frequency of 1 per analytical batch? Y [X] N [ ]
Were MBs within the control window? Y [X] N [ ]
Were any data flagged because of blank problems? Y [ ] N [X]

Describe Any Actions Taken: None Required.

Comments: MBs for SW7471B and EPA 6010D were non-detect. A MB was not analyzed for ASTM D2974.

3. Laboratory Control Samples

Were Laboratory Control Samples (LCS) analyzed at the frequency of 1 per batch? Y [X] N [ ]
Were LCS results within the control window? Y [X] N [ ]
Were any data flagged because of LCS problems? Y [ ] N [X]

Describe Any Actions Taken: None Required.

Comments: The LCS %R were within limits for EPA 6010D and SW7471B. An LCS was not analyzed for ASTM D2974.

Work Order: 10587273

4. Duplicate Sample Results

Were Laboratory Duplicate Samples (LDS) analyzed at the frequency of 1 per batch?	Y	X	N	
Were LDS results within the control window?	Y	X	N	
Were any data flagged because of LDS problems?	Y		N	X

Describe Any Actions Taken: None Required.

Comments: For method SW7471B batch 783306, an LMS/LMS Duplicate (LMSD) generated from a sample not from this work order was used for the LDS calculation. The RPD was within control limits.

For method SW7471B batch 783307, an LMS/LMS Duplicate (LMSD) generated from BPSOU-UR05SS02-110421-1-FD was used for the LDS calculation. The RPD was within control limits.

For method EPA 6010D batch 783304, an LMS/LMS Duplicate (LMSD) generated from a sample not from this work order was used for the LDS calculations. The RPDs were within control limits.

For method EPA 6010D batch 783305, an LMS/LMS Duplicate (LMSD) generated from BPSOU-UR05SS02-110421-1-FD was used for the LDS calculations. The RPDs were within control limits.

For ASTM D2974, a duplicate generated from BPSOU-UR05SS02-110421-1 and a duplicate generated from BPSOU-UR05SS05-110421-1 were used for the LDS calculations. The RPDs were within control limits.

5. Matrix Spike Sample Results

Were Laboratory Matrix Spike Samples (LMS) analyzed at the frequency of 1 per batch?	Y	X	N	
Were LMS results within the control window?	Y		N	X
Were any data flagged because of LMS problems?	Y		N	X

Describe Any Actions Taken: None Required.

Comments: For method SW7471B batch 783306, an LMS/LMSD was generated from a sample not from this work order. The %R of the LMS/LMSD for mercury (78% and 76%, respectively) were outside control limits (80-120%). Since the parent sample was not from this work order, no qualifications were warranted.

For method SW7471B batch 783307, an LMS/LMSD was generated from BPSOU-UR05SS02-110421-1-FD. The %R of the LMS/LMSD for mercury were within control limits (80-120%).

For method EPA 6010D batch 783304, an LMS/LMSD was generated from a sample not from this work order. The %R of the LMSD for zinc (69%) was outside control limits (75-125%). Since the parent sample was not from this work order, no qualifications were warranted. All other %R were within limits.

For method EPA 6010D batch 783305, an LMS/LMSD was generated from BPSOU-UR05SS02-110421-1-FD. The %R of the LMS/LMSD for arsenic (49% and 67%, respectively), copper (-72% and -115%, respectively), lead (204% and 126%, respectively), and zinc (776% and 318%, respectively) were outside control limits (75-125%). Per the NFG *"Spike recovery limits does not apply when the original sample concentration is ≥ 4 times the spike added. In such an event the data shall be reported unflagged, even if the %r does not meet the acceptance criteria." (EPA, 2017).* The original sample concentrations for arsenic, copper, lead, and zinc were greater than 4 times the spike added; therefore, no qualifications were warranted. All %R for cadmium were within limits.

An LMS was not analyzed for ASTM D2974.

6. Field Blanks

Were field blanks submitted as specified in the QAPP?	Y		N		N/A	X
Were field blanks within the control window?	Y		N		N/A	X
Were any data qualified because of field blank problems?	Y		N		N/A	X

Describe Any Actions Taken: None Required.

Comments: Field blanks were not required as there is no sampling equipment re-used.

7. Field Duplicates

Were field duplicates submitted as specified in the QAPP?	Y	X	N		N/A	
Were results for field duplicates within the control window?	Y		N	X	N/A	
Were any data qualified because of field duplicate problems?	Y	X	N		N/A	

Describe Any Actions Taken: One field duplicate pair was submitted on this work order, BPSOU-UR05SS02-110421-1 and BPSOU-UR05SS02-110421-1-FD. The results for copper and percent moisture were greater than 5 times the reporting limit, but the RPD was greater than 35%. The copper and percent moisture results for BPSOU-UR05SS02-110421-1 and BPSOU-UR05SS02-110421-1-FD were qualified "J". Per the NFG, "*For a duplicate sample analysis that does not meet the technical criteria, apply the action to all samples of the same matrix if the samples are considered sufficiently similar"* (EPA, 2017). No samples are considered sufficiently similar; therefore, no additional qualifications are warranted.

Comments: The precision for the remaining analytes was within control limits.

8. Overall Assessment

Are there analytical limitations of the data that users should be aware of? Y [X] N [ ]

If so, explain: On this WO 10587273, the following qualifications were made:

In addition to the qualifications outlined in the sections above, results which were reported between the method detection limit and the reporting limit were qualified "A" when no additional qualifications were warranted.

The table below lists the qualifications on the natural samples:

Field ID	Analyte	Final Qualification	Reason Code
BPSOU-UR05SS02-110421-1	Mercury	J-	Pres
BPSOU-UR05SS02-110421-2	Mercury	J-	Pres
BPSOU-UR05SS02-110421-3	Mercury	J-	Pres
BPSOU-UR05SS03-110421-1	Mercury	J-	Pres
BPSOU-UR05SS03-110421-2	Mercury	J-	Pres
BPSOU-UR05SS03-110421-3	Mercury	J-	Pres
BPSOU-UR05SS04-110421-1	Mercury	J-	Pres
BPSOU-UR05SS04-110421-2	Mercury	J-	Pres
BPSOU-UR05SS04-110421-3	Mercury	J-	Pres
BPSOU-UR05SS05-110421-1	Mercury	J-	Pres
BPSOU-UR05SS05-110421-2	Mercury	J-	Pres
BPSOU-UR05SS05-110421-3	Mercury	J-	Pres
BPSOU-UR01SS07-110321-3	Mercury	UJ	Pres
BPSOU-UR05SS02-110421-1	Copper	J	FD
BPSOU-UR05SS02-110421-1	Percent Moisture	J	FD
BPSOU-UR01SS07-110321-3	Cadmium	A	<RL

The table below lists the qualifications on the field quality control samples:

Field ID	Analyte	Final Qualification	Reason Code
BPSOU-UR05SS02-110421-1-FD	Mercury	J-	Pres
BPSOU-UR05SS02-110421-1-FD	Copper	J	FD
BPSOU-UR05SS02-110421-1-FD	Percent Moisture	J	FD

Reason for qualification:
Pres = The receipt temperature was outside of required range.
FD = Field duplicate precision was outside control limits.
<RL = The result is above the method detection limit and below the reporting limit.

Comments:

9. Authorization of Data Validation

Data Validator
Name: Sara Ward **Reviewed by:** Josie McElroy

Signature: Sara Ward Josie McElroy

Date: 12/1/2021 12/1/2021

Work Order: 10587273

Attachment 2
Level A/B Assessment Checklist

Level A/B Assessment Checklist

1. General Information

Site: Butte Priority Soils Operable Unit
Project: Unreclaimed Sites 2021
Client: Atlantic Richfield Company
Sample Matrix: Soil

2. Screening Result

Data are:

1. Unusable
2. Level A
3. Level B 10586267, 10586277, 10586396, 10587272, 10587273, P_20211102_98052, and P_20211103_98052

I. **Level A**

Criteria – The following must be fully documented.	Yes/No	Comments
1. Sampling date	Yes	Logbook
2. Sampling team or leader	Yes	Logbook
3. Physical description of sampling location	Yes	Logbook
4. Sample depth (soils)	Yes	Logbook
5. Sample collection technique	Yes	Logbook
6. Field preparation technique	Yes	Logbook
7. Sample preservation technique	Yes	Logbook
8. Sample shipping records	Yes	Logbook and Chain of Custody (CoC)

II**. Level B**

Criteria – The following must be fully documented.	Yes/No	Comments
1. Field instrumentation methods and standardization complete	Yes	Logbook
2. Sample container preparation	Yes	Logbook
3. Collection of field replicates (1/20 minimum)	Yes	Logbook
4. Proper and decontaminated sampling equipment	Yes	Logbook
5. Field custody documentation	Yes	Logbook and CoC
6. Shipping custody documentation	Yes	Logbook and CoC
7. Traceable sample designation number	Yes	Logbook Lab Report, and CoC
8. Field notebook(s), custody records in secure repository	Yes	
9. Completed field forms	Yes	Logbook and Field Data Sheets

Attachment 3
Data Validation Quality Control Criteria

XRF							
Quality Control	**Frequency**	**Acceptance Criteria**	**Criteria**	**Action**			**Reference**
				Associated Sample Result Detected	**Associated Sample Result Non-Detected**	**Reason Code**	
System Check	Performed daily, prior to sample analysis	Performed daily, prior to sample analysis	System Check not performed	Professional Judgment J/R	Professional Judgment UJ/R	CX	SOP-SFM-02
		Resolution < 195	Resolution ≥ 195	Professional Judgment J/R	Professional Judgment UJ/R	SC	
SiO_2 Standard	Performed daily, prior to sample analysis, at least 1 for every 20 sample analyses, and at end of each day of analysis	Performed daily, prior to sample analysis, at least 1 for every 20 sample analyses, and at end of each day of analysis	Frequency criteria not met	J	UJ	CX	SOP-SFM-02 Niton XL3 Soil QC Sheet
		Arsenic ≤10 mg/kg Cadmium ≤50 mg/kg Copper ≤20 mg/kg Lead ≤10 mg/kg Mercury ≤10 mg/kg Zinc ≤10 mg/kg	>10 mg/kg >50 mg/kg >20 mg/kg >10 mg/kg >10 mg/kg >10 mg/kg	Results < 10x the SiO2 result - J+	No Qualification	B	
Calibration Check Samples	Performed daily, prior to sample analysis, at least 1 for every 20 sample analyses, and at end of each day of analysis	Performed daily, prior to sample analysis, at least 1 for every 20 sample analyses, and at end of each day of analysis	Frequency criteria not met	J	UJ	CX	SOP-SFM-02 Niton XL3 Soil QC Sheet
		NIST Standard: Arsenic 0 - 35 mg/kg Cadmium 0 - 60 mg/kg Copper 0 - 60 mg/kg Lead 0 - 35 mg/kg Mercury 0 - 12 mg/kg Zinc 50 - 160 mg/kg	< Lower Control Limit	J-	UJ	CSS	
		RCRA Standard: Arsenic 400 - 600 mg/kg Cadmium 400 - 600 mg/kg Lead 400 - 600 mg/kg	> Upper Control Limit	J+	No Qualification		
XRF Duplicate	1 per 20 samples	RPD ≤ 35% for detected results	Frequency criteria not met	J	UJ	DX	SOP-SFM-02 UR QAPP
			RPD ≤ 35%	No Qualification	No Qualification	D%	
			RPD > 35%	J	UJ		
XRF Replicate	1 per 20 samples	RPD ≤ 35% for detected results	Frequency criteria not met	J	UJ	RX	SOP-SFM-02 UR QAPP
			RPD ≤ 35%	No Qualification	No Qualification	R%	
			RPD > 35%	J	UJ		
Field Duplicate	1 per 20 samples	RPD ≤ 35% for detected results	Frequency criteria not met	J	UJ	FDX	UR QAPP
			RPD ≤ 35%	No Qualification	No Qualification	FD	
			RPD > 35%	J	UJ		

Laboratory							
Quality Control	**Frequency**	**Acceptance Criteria**	**Criteria**	**Data Validation Action**			**Reference**
				Associated Sample Result -Detected	**Associated Sample Result - Non-Detected**	**Reason Code**	
Laboratory Quality Control Samples							
Holding Time	Every Sample	EPA 6010D (metals/metalloids)	≤ 6 months	J-	Professional Judgement UJ or R	H	NFG
		EPA 7471B (mercury)	≤ 28 days	J-	Professional Judgement UJ or R		
Preservation	Every Sample	EPA 6010D (metals/metalloids)	N/A (solids)	No Qualification	No Qualification	Pres	NFG
		EPA 7471B (mercury)	≤ 6 ºC	No Qualification	No Qualification		
			≥ 6 ºC but ≤ 10 ºC	Professional Judgement J	Professional Judgement UJ		
			> 10 ºC	J-	Professional Judgement UJ or R		
Method Blank (MB)	One per batch of up to 20 samples.	≤ 1/2 RL (6010D) ≤ Absolute Value of RL (7471B)	≤ 1/2 RL (6010D) or Absolute Value of RL (7471B)	No Qualification	No Qualification	MB	CFRSSI QAPP Pace SOP
			> 1/2 RL (6010D) or Absolute Value of RL (7471B)	sample result < 10x blank detection: U	No Qualification		
Laboratory Control Sample (LCS)	One per batch of up to 20 samples.	%R 80-120% (all methods)	%R < 40%	J-	R	L%	CFRSSI QAPP NFG Pace SOP
			%R 40-79%	J-	UJ		
			%R 80-120%	No Qualification	No Qualification		
			%R > 120%	J+	No Qualification		
			%R > 150%	R	No Qualification		
Laboratory Duplicate Sample (LDS)[3]	One per batch of up to 20 samples.	All methods: 1. If both original sample and duplicate sample results are ≥ 5x the RL, then RPD ≤ 20% (LCSD/MSD), RPD ≤35% (soil); 2. If original sample or duplicate sample result < 5x the RL, then absolute difference between sample and duplicate ≤ 2x RL (soils)	Both original and duplicate sample results are ≥ 5x the RL and RPD ≤ 20% (LCSD/MSD), RPD ≤35% (soil).	No Qualification	No Qualification	D%	CFRSSI QAPP NFG Pace SOP
			Both original and duplicate sample results are ≥ 5x the RL and RPD is > 20% (LCSD/MSD), > 35% (soil).	J	UJ		
			RPD > 100%	Professional Judgement	Professional Judgement		
			Original sample or duplicate sample result < 5x the RL, and absolute difference between sample and duplicate ≤ 2x RL (soils)	No Qualification	No Qualification		
			Original sample or duplicate sample result is < 5x the RL and absolute difference between the sample and duplicate > 2x RL (soil).	J	UJ		
Laboratory Matrix Spike (LMS)	One per batch of up to 20 samples.	6010D - %R 75-125% 7471B - %R 80-120% if sample analyte concentration < 4x spike concentration	%R < 30%	J-	R	S%	CFRSSI QAPP NFG Pace SOP
			%R 30-74% (6010D) %R 30-79% (7471B)	J-	UJ		
			%R 75-125% (6010D) %R 80-120% (7471B)	No Qualification	No Qualification		
			%R >125% (6010D) %R >120% (7471B)	J+	No Qualification		
			sample analyte concentration ≥ 4x spike concentration	No Qualification	No Qualification		

Field Quality Control Samples							
Field Duplicate Sample	One per 20 samples collected.	All methods: 1. If both original sample and duplicate sample results are ≥ 5x the RL, RPD ≤ 35% (soil); 2. If original sample or duplicate sample result < 5x the RL, then absolute difference between sample and duplicate ≤ 2x RL (soils)	Both original and duplicate sample results are ≥ 5x the RL and RPD RPD ≤35% (soil).	No Qualification	No Qualification	FD	CFRSSI QAPP NFG
			Both original and duplicate sample results are ≥ 5x the RL and RPD is > 35% (soil).	J	UJ		
			RPD > 100%	Professional Judgement	Professional Judgement		
			Original sample or duplicate sample result < 5x the RL, and absolute difference between sample and duplicate ≤ 2xRL (soils)	No Qualification	No Qualification		
			Original sample or duplicate sample result is < 5x the RL and absolute difference between the sample and duplicate > 2xRL (soil).	J	UJ		

Notes:

1. Associated sample results:

For Field Blank results that do not meet technical criteria, apply action to all samples in the SDG.

For Field Duplicate results that do not meet technical criteria, apply action to field duplicate pair and any samples from the same sample location in the SDG.

For MB and LCS results that do not meet technical criteria, apply action to all samples in the analytical batch.

For LDS or LMS/MSD results that do not meet technical criteria, apply action to the parent sample and, per the NFG, "apply the action to all samples of the same matrix if the samples are considered sufficiently similar."

For holding time and preservation that do not meet technical criteria, apply action to sample.

2. For consistency in validations between validators, if a sample result is reported as non-detect, the MDL is used for the duplicate absolute difference calculations.

3. An LCS, an LMS, or an original sample may all be used to perform a laboratory duplicate. If a LCS Duplicate or LMS Duplicate is used, the QC sample must also meet the applicable %R technical criteria.

Qualifications:

U - Non-detect
UJ - Estimated non-detect
J - Estimated
J+ - Estimated high
J- - Estimated low
R - Rejected

Abbreviations:

MDL - method detection limit
RL - reporting limit
%R - percent recovery
RPD - relative percent difference

References:

CFRSSI QAPP - ARCO, 1992. Clark Fork River Superfund Site Investigations (CFRSSI) Quality Assurance Project Plan (QAPP). Prepared for ARCO by PTI Environmental Services, Bellevue, Washington. May 1992.

NFG - EPA, 2020. National Functional Guidelines for Inorganic Superfund Methods Data Review. November 2020.

-- Available at EPA's Superfund Analytical Services and Contract Laboratory Program website: https://www.epa.gov/clp/contract-laboratory-program-national-functional-guidelines-data-review

SOP-SFM-02 - Operating XL3-X-Ray Fluorescence Analyzer General. Pioneer Technical Services, Inc. January 2018.

UR QAPP - Silver Bow Creek/Butte Area NPL Site Butte Priority Soils Operable Unit 2022 Final Unrelaimed Sites Quality Assurance Project Plan (QAPP). Prepared for Atlantic Richfield Company by Pioneer Technical Services, Inc, Butte, Montana. June 2021.

Niton XL3 Soil QC Sheet - Niton XL3 Soil QC Certificate of Calibration. Thermo Fisher Scientific. June 2014.

Pace SOP -

EPA 6010D - ENV-SOP-MIN4-0052: Metals Analysis by ICP - Method 6010 and 200.7

EPA 7471B - ENV-SOP-MIN4-0054: Mercury in Liquid and Solid/Semi-Solid Waste by 7470A, 7471, 7471B, and 245.1

Attachment B
Field Forms and Related Documents

11/2/21 Tues. UR01

0730] On site @ Butte office to Calibrate and collect equipment. Fill out FAF and talk through Safety for the day.

Hanna pH probe cal HI99121

Live Reading	Buffer
7.05 @ 22°C	4.00
3.99 @ 22°C	7.00
10.06 @ 22°C	10.00

Cal with 0.1, Site is Residential Sampling Crew: Jesse S, Matt S. Susan H., and Nathan F.

DI bottle: D77 for Decon

On site @ 0845] to begin Sampling and Site characterization. Sample locations were marked with a flag using GPS unit for 55-1 to 55-27. The following Samples were collected per Procedures on pg 2+3. Samples are Summarized below per Sample location.

Sample location 25 55-25

BPSOU-UR01SS25-110221-1 @ 1220

Ran XRF, Lab Split Submitted for Parent Field Duplicate.

11/2/21 Tues UR01

BPSOU-UR01SS25-110221-1-FD @ 1215

Ran XRF, Lab Split Submitted for Field Duplicate, Parent ID: BPSOU-UR01SS25-110221-1

BPSOU-UR01SS25-110221-2 @ 1210

Ran XRF, Lab Split Submitted for Hg ± 35% Human Health

BPSOU-UR01SS25-110221-3 @ 1205

Ran XRF, No Lab

Sample location 27 SS-27

BPSOU-UR01SS27-110221-1 @ 1200

XRF Ran, No Lab

BPSOU-UR01SS27-110221-2 @ 1155

Ran XRF, No Lab

BPSOU-UR01SS27-110221-3 @ 1150

Ran XRF, Lab Submitted for Hg ±35%

Sample location 23 SS-23

BPSOU-UR01SS23-110221-1 @ 1225

Ran XRF, Lab Submitted for Hg ± 35% Human Health

BPSOU-UR01SS23-110221-2 @ 1220

Ran XRF, Lab Submitted for Pb ± 35% Human Health

BPSOU-UR01SS23-110221-3 @ 1215

Ran XRF, Lab Submitted for Pb ± 35% Human Health

Cont...

11/2/21 Tues URO1

Sample location 26 SS-26

BPSOU-URO1SS26-110221-1 @ 1240

XRF Can, No Lab

BPSOU-URO1SS26-110221-2 @ 1235

XRF Can, Lab Submitted for ±35% Hg Human

BPSOU-URO1SS26-110221-3 @ 1230

XRF Can, Lab Submitted for ±35% Hg Human Health

Sample location 24 SS-24

BPSOU-URO1SS24-110221-1 @ 1235

XRF Can, Lab Submitted for ±35% Hg Human Health

BPSOU-URO1SS24-110221-2 @ 1230

XRF Can, no lab

BPSOU-URO1SS24-110221-3 @ 1225

XRF Can, no Lab

Sample location 21 SS-21

BPSOU-URO1SS21-110221-1 @ 1235

XRF Can, Lab Submitted for Storm water

BPSOU-URO1SS21-110221-2 @ 1230

XRF Can, Lab Submitted for ±35% As Human Health

BPSOU-URO1SS21-110221-3 @ 1225

XRF Can, Lab Submitted for ±35% As Human Health

Sample location 22 SS-22

BPSOU-URO1SS22-110221-1 @ 1255

XRF Can, no Lab

Samples collected for day include SS08 through SS27 + OP01

11/2/21 Tues URO1

XRF can on SS-21, 22, 23, 24, 25, 26, and 27.

Samples SS-08 to SS-20 will be analyzed 11/03/21.

Dave Swanson onsite for walkthrough @ 1030, offsite @ 1045.

Kendra visited the site to use the XRF for two samples XRF Reading #146 and 147, SS08 through SS27 are preserved @ Butte office Ref Pg. 4.

All equipment Decon followed Pg 3+4.

Crew off site at 1630.

XRF was having issues most end of day during close out of Standards. Standards, Rep+DUP wele Can after Unit warmed up.

Out of office @ 1800

Sample URO1SS14 not sampled due to Location being outside of Arco Property.

Jessica

11/3/21 Wednesday UR01

0730 On site @ Butte Office to Calibrate and collect equipment. Fill out FAF and tailgate Safety for the day.

Hanna pH Cal 11/29/21

Live	Buffer
3.92 @ 20.6	7.34
10.05 @ 20.7	10
7.05 @ 20.7	7

Cal within 0.1 reqd

Sampling Crew: Jesse S., Justin H., Matthew S., Kendra O.

DI bottle: 077 for Deeon

Kendra is @ Butte Office running XRF Samples collected Yesterday 11/2/21.

0815 On Site @ UR01 to begin Sampling and Site Characterization Samples collected are Summarized below by Sample location.

XRF and Lab Samples collected on 11/2/21 are Summarized below.

Sample location 22 55-22

BPSOU-UR01SS22-110221-2 @ 1250

Ran XRF, Lab Submitted for ±35% Hg Human Standard.

BPSOU-UR01SS22-110221-3 @ 1245

Ran XRF, no Lab

Sample location 20 55-20

BPSOU-UR01SS20-110221-1 @ 1300

Ran XRF, no Lab

BPSOU-UR01SS20-110221-2 @ 1255

Ran XRF, no Lab

BPSOU-UR01SS20-110221-3 @ 1250

Ran XRF, no Lab

Sample location 19 55-19

BPSOU-UR01SS19-110221-1 @ 1330

Ran XRF, Lab Submitted for ±35% Hg Human

BPSOU-UR01SS19-110221-2 @ 1325

Ran XRF, Lab Submitted for ±35% Hg Human

BPSOU-UR01SS19-110221-3 @ 1320

Ran XRF, Lab Submitted for ±35% Hg Human

Sample location 18 55-18

BPSOU-UR01SS18-110221-1 @ 1315

Ran XRF, Lab Submitted for ±35% Hg Human

BPSOU-UR01SS18-110221-2 @ 1310

Ran XRF, Lab Submitted for ±35% Hg Human

BPSOU-UR01SS18-110221-3 @ 1305

Ran XRF, Lab Submitted for ±35% Hg Human

Sample location 17 55-17

BPSOU-UR01SS17-110221-1 @ 1350

Ran XRF, no Lab

BPSOU-URO1SS17-110221-2 @ 1345
Ran XRF, no Lab
BPSOU-URO1SS17-110221-3 @ 1340
Ran XRF, no Lab
Sample location 16 SS-16
BPSOU-URO1SS16-110221-1 @ 1345
Ran XRF, no Lab
BPSOU-URO1SS16-110221-2 @ 1340
Ran XRF, Lab Submitted for ± 35% Hg Human
BPSOU-URO1SS16-110221-3 @ 1335
Ran XRF, Lab Submitted for ± 35% Hg human
~~BPSOU~~ 05 Sample location 15 SS-15
BPSOU-URO1SS15-110221-1 @ 1315
Ran XRF, Lab Submitted for ± 35% Hg Human
BPSOU-URO1SS15-110221-2 @ 1310
Ran XRF, Lab Submitted for ± 35% Hg Human
XRF Rep on 2 Dup Cans, Standards and System check.
BPSOU-URO1SS15-110221-3 @ 1305
Ran XRF, Lab Submitted for ± 35% Hg Human
Sample location 05 09 SS-09
~~BPSS~~ BPSOU-URO1SS09-110221-1 @ 1440
XRF Ran, no lab
BPSOU-URO1SS09-110221-2 @ 1435
XRF Ran, no Lab

BPSOU-URO1SS09-110221-3 @ 1430
XRF Ran, no Lab
Sample location 8 SS-08
BPSOU-URO1SS08-110221-1 @ 1435
XRF Ran, Lab Submitted for ± 35% Hg Human
BPSOU-URO1SS08-110221-2 @ 1430
XRF Ran, Lab Submitted for ± 35% Hg Human
BPSOU-URO1SS08-110221-3 @ 1425
XRF Ran, Lab Submitted for ± 35% Hg Human
~~OPPortunistic Sample location~~ OP01
BPSOU-URO1OP01-110221-1 @ 1315
XRF Ran, no lab
BPSOU-URO1OP01-110221-2 @ 1310
XRF Ran, no Lab
BPSOU-URO1OP01-110221-3 @ 1305
XRF Ran, no Lab
Sample location ~~SS~~ 05 11 SS-11
BPSOU-URO1SS11-110221-1 @ 1525
XRF Ran no Lab
BPSOU-URO1SS11-110221-2 @ 1520
XRF Ran, Lab Submitted for ± 35% Hg Human
BPSOU-URO1SS11-110221-3 @ 1515
XRF Ran, Lab Submitted for ± 35% Hg Human
Sample location 10 SS-10
BPSOU-URO1SS10-110221-1 @ 1505
XRF Ran, no Lab

Rite in the

11/3/21 VR01

BPSOV-VR01SS10-110221-2 @ 1500
Ran XRF, Lab Submitted for ± 35% Hg Human
BPSOV-VR01SS10-110221-3 @ 1455
Ran XRF, Lab Submitted for ± 35% Hg Human
Sample location 13 SS-13
BPSOV-VR01SS13-110221-1 @ 1500
Ran XRF, Lab Submitted for ± 38% Hg Human
BPSOV-VR01SS13-110221-2 @ 1455
Ran XRF, Lab Submitted for ± 35% Hg Human
BPSOV-VR01SS13-110221-3 @ 1450
Ran XRF, Lab Submitted for ± 35% Hg Human
Rep, Dup and System check Can on XRF,
Sample location 12 SS-12
BPSOV-VR01SS12-110221-1 @ 1525
Ran XRF, no Lab
BPSOV-VR01SS12-110221-2 @ 1520
Ran XRF, Lab Submitted for ± 35% Hg Human
BPSOV-VR01SS12-110221-3 @ 1515
Ran XRF, no Lab

Samples collected on 11/3/21
Characterized Before Per Sample location
Sample location 1 SS-01
BPSOV-VR01SS01-110321-1 @ 1025
Ran XRF, no lab

11/3/21 VR01

BPSOV-VR01SS01-110321-2 @ 1020
Ran XRF, Lab Submitted for ± 35% Hg Human
BPSOV-VR01SS01-110321-3 @ 1015
Ran XRF, Lab Submitted for ± 35% Hg Human
BPSOV-VR01SS01-110321-3-FD @ 1010
Ran XRF, Lab Submitted for Field Duplicate
Parent Sample: BPSOV-VR01SS01-110321-3
Sample location 2 SS-2
BPSOV-VR01SS02-110321-1 @ 1030
Ran XRF, no lab
BPSOV-VR01SS02-110321-2 @ 1025
Ran XRF, Lab Submitted for ± 35% Hg human
BPSOV-VR01SS02-110321-3-FD @ 1020
Ran XRF, Lab Submitted for Field Duplicate
Parent ID: BPSOV-VR01SS02-110321-2
BPSOV-VR01SS02-110321-3 @ 1015
Ran XRF, no lab
Sample location 3 SS-03
BPSOV-VR01SS03-110321-1 @ 0945
Ran XRF, Lab Submitted for ± 35% Hg Human
BPSOV-VR01SS03-110321-2 @ 0940
Ran XRF, Lab Submitted for ± 35% Hg Human
BPSOV-VR01SS03-110321-3 @ 0935
Ran XRF, Lab Submitted for ± 35% Hg Human
Sample location 4 SS-4
BPSOV-VR01SS04-110321-1 @ 0955
Ran XRF, Lab Submitted for ± 35% Hg Human

BPSOU-URO1SS04-110321-~~2~~ @ 0950
XRF Con, Lab Submitted for ± 35% Hg Human
BPSOU-URO1SS04-110321-3 @ 0945
XRF Con, Lab Submitted for 35% Hg Human
Sample Location 5 SS-05
BPSOU-URO1SS05-110321-1 @ 1105
XRF Con, Lab Submitted for Hg ± 35% Human
BPSOU-URO1SS05-110321-2 @ 1100
XRF Con, Lab Submitted for ± 35% Hg Human
BPSOU-URO1SS05-110321-3 @ 1055
XRF Con, Lab Submitted for ± 35% Hg Human
Rep, Dup, and System checks Con on SS05-2. Sample location 7 SS-7
BPSOU-URO1SS07-110321-1 @ 1050
XRF Con, Lab Submitted for ± 35% Hg human
BPSOU-URO1SS07-110321-2 @ 1040
XRF Con, Lab Submitted for ± 35% Hg hum
BPSOU-URO1SS07-110321-3 @ 1040 US 35
XRF Con, Lab Submitted for ± 35% Hg human
BPSOU-URO1SS07-110321-1-FD @ ~~1100~~ US 1045
Parent Sample: BPSOU-URO1SS07-110321-1
XRF Con, ~~Lab Submitted for Field Dup~~. US
Sample ~~Site~~ 6 SS-6
BPSOU-URO1SS06-110321-1 @ 1055
XRF Con, Lab Submitted for ± 35% Hg Human
* No Lab Sent for BPSOU-URO1SS07-110321-1-FD

BPSOU-URO1SS06-110321-1-FD @ 1100
XRF Ran, Lab submitted for ± 35% Hg human and Field Duplicate.
Parent ID: BPSOU-URO1SS06-110321-1
BPSOU-URO1SS06-110321-2 @ 1050
XRF Con, Lab Submitted for ± 35% Hg human
BPSOU-URO1SS06-110321-3 @ 1045
XRF Con, no lab
Rep, Dup, System Checks and Standards Ran.
930 R.C Stevin and Mike Mcquilty on-site for site visit and walkthrough. Off site @ 1000
Site Sampling and Characterization of URO1 is complete. All Samples collected in 1 9+ bag, for As, Cd, Cu, Pb, Zn, and Hg. by 6010 and 7471 for Hg. All data collected electronically and on field sheets. CoC to and 11 Contain all Samples collected on 11/2/21. ~~US~~ ~~SS01-FD~~. US Shipment Sent on 11/3/21 Tracking #'s: 4278 9934 6440, 4278 9934 6406 URO1SS01-3 and URO1SS01-3-FD URO1SS02-2 and URO1SS02-2-FD were collected on 11/3/21

Rite in the Rain

 11/3/21 UR01

All decon ~~ ~~ follows pg 3+4
Crew off site @ 1230

Samples for UR03 on 10/28/21
Shipped 11/1/21 Tracking #
/o 4278 9934 6391
As, Cd, Cu, Pb, Zn with 6010 and
Hg with 7471. All Samples
Shipped in 1 qt bag.

[signature]

11/4/21 UR-05

0730 | @ Promel Butte office
to collect equipment + and go
through Safety.
Sampling Crew: Jesse S, Nathan, F.,
Justin H, and Mathew S.
Hanna pH probe cal H199121

Live Reading	Buffer
3.98 @ 20.1°C	4.00
6.97 @ 20.1°C	7.00
10.07 @ 20.2°C	10.00

Cal with 0.1
DI bottle: CIS AUS
845 | on site @ UR-05 to
begin Sampling and Site Character-
~~ization~~ Characterization per Pg 3+4
2+3. Sample locations pinned with
GPS. Samples collected are
Summarized per Sample location
below.

Sample location SS-4
BPSOU-UR05SS04-110421-1 @ 910
Ran XRF, Lab Submitted for ± 35% Hg Human
BPSOU-UR05SS04-110421-2 @ 0905
Ran XRF, Lab Submitted for ± 35% Hg Human
BPSOU-UR05SS04-110421-3 @ 0900
Ran XRF, Lab Submitted for ± 35% Hg human

BPSOU: Unreclaimed Sites Field XRF and Soil pH Results

Site Number: UR01 Operator: JS, MS, JH, NF
Land Use: Residential XRF Unit #: 98052
pH probe #: 1

*Reference 2021 UR Confirmation Sample Decision Tree for more information on declaring the need for a confirmation sample.

Soil Action/Screening Levels (mg/kg)	As	Cd	Cu	Pb	Zn	Hg
Residential	250			1,200		10
Non-Residential				2,300		
Recreational	1,000					
Commercial	500					
Storm Water	200	20	1000	1000	1000	10

XRF Reading #	Sample Name	Depth (inches)	Soil pH (s.u.)	Date Collected	Time Collected	Date Analysed	As	Cd	Cu	Pb	Zn	Hg	Lab Sample
JS 141	~~BPSOU-UR~~ SYSTEM Check	—	—	11/2/21	—		Time	56	Sec	RES	177.3		—
JS 142	~~BPSOU-UR~~ SIO2	—	—		—		<3	10	<12	<4	<6	<5	—
JS 143	~~BPSOU-UR~~ NIST	—	—		—		11	15	30	19	86	<7	—
144	~~BPSOU-UR~~ RCRA	—	—		—		481	491	27	475	44	<7	—
145	~~BPSOU-UR~~ USGS	—	—		—		79	20	208	770	691	<7	—
* 148	~~BPSOU-UR~~ SYStem CHECK	—	—		—		Time	56		RES	173.4		—
* 149	BPSOU-UR015525-110221-1	0-2	7.82		12:20	11/2/21	12	<7	76	63	200	<6	Yes
150	BPSOU-UR015525-110221-1-FD	0-2	8.08		1215		13	<7	87	51	213	<6	Yes
151	BPSOU-UR015525-110221-2	2-6	8.20		1210		18	<7	99	72	233	(<7)	Yes
152	BPSOU-UR015525-110221-3	6-12	8.17		1205		7	<6	51	31	137	<5	NO
153	BPSOU-UR015527-110221-1	0-2	8.45		1200		15	9	64	32	133	<6	NO
154	BPSOU-UR015527-110221-2	2-6	8.20		1155		28	8	78	61	260	<6	NO
155	BPSOU-UR015527-110221-3	6-12	8.42		1150		10	<8	94	37	148	(<7)	Yes
156	BPSOU-UR015523-110221-1	0-2	7.06		1225		<22	<7	218	590	1515	(<7)	Yes
157	BPSOU-UR015523-110221-2 (JS)	2-6	5.46		1220		98	10	(688)	(1579)	1458	(<8)	Yes
158	BPSOU-UR015523-110221-3	6-12	4.88		1215		82	<7	382	(967)	1425	(<8)	Yes
159	BPSOU-UR015526-110221-1	0-2	7.09		1240		28	<7	78	54	204	<6	NO
160	BPSOU-UR015526-110221-2	2-6	8.00		1235		23	9	85	117	337	(<7)	Yes
161	BPSOU-UR015526-110221-3	6-12	8.12		1230		20	<8	105	160	342	(<7)	Yes
162	BPSOU-UR015524-110221-1	0-2	7.92		1235		10	<7	91	56	218	(<7)	Yes
163	BPSOU-UR015524-110221-2	2-6	~~7.95~~ JS 8.65	↓	1230	↓	13	<7	64	40	171	<6	NO

* 146 and 147 were ran for another Project. Contact Kendra
* 148 System Checks ran after System was shut down
* 149 URGAP name [illegible]

BPSOU: Unreclaimed Sites Field XRF and Soil pH Results

Site Number: UR01 Operator: JS
Land Use: Residential
XRF Unit #: 98052
pH probe #: 1

*Reference 2021 UR Confirmation Sample Decision Tree for more information on declaring the need for a confirmation sample.

Soil Action/Screening Levels (mg/kg)	As	Cd	Cu	Pb	Zn	Hg
Residential	(250)			(1,200)		(10)
Non-Residential				2,300		
Recreational	1,000					
Commercial	500					
Storm Water	200	20	1000	1000	1000	10

XRF Reading #	Sample Name	Depth (inches)	Soil pH (s.u.)	Date Collected	Time Collected	Date Analysed	As	Cd	Cu	Pb	Zn	Hg	Lab Sample
164	BPSOU-UR01SS24-110221-3	6-12	9.25	11/2/21	1225	11/2/21	10	<8	52	21	116	<6	NO
165	BPSOU-UR01SS21-110221-1	0-2	5.38		1235		(377)	<8	(784)	111	319	(<7)	Yes
166	BPSOU-UR01SS21-110221-2	2-6	5.15		1230		(201)	<8	248	44	204	(<7)	Yes
167	BPSOU-UR01SS21-110221-3	6-12	4.05		1225		(185)	<8	273	25	104	(<7)	Yes
168*	~~BPSOU-UR~~ SYSTEM CHECK	—	—		—		Time	56.0	Sec		RES	168	—
*169	BPSOU-UR01SS22-110221-1	0-2	7.00		1255		34	<7	67	29	79	<6	NO
170	BPSOU-UR01SS22-110221-1-D	0-2	7.00		1255		31	<7	67	26	86	<6	—
77 ~~171~~ 35	BPSOU-UR01SS22-110221-1-R	0-2	7.00		1255		31	<7	51	25	86	<6	—
174*	~~BPSOU-UR~~ SYSTEM Check	—	—		—		Time	56.1		RES	176.1		—
175*	BPSOU-UR SYSTEM Check	—	—		—		Time	56.1		RES	170.9		—
178	BPSOU-UR System Check	—	—		—		Time	56.0		RES	170.1		—
179	~~BPSOU-UR~~ SIO2	—	—		—		<3	9	<12	<3	<5	<5	—
180	~~BPSOU-UR~~ NIST	—	—		—		17	<8	35	19	87	<6	—
181	~~BPSOU-UR~~ RCRA	—	—		—		487	526	<16	481	54	<7	—
182	~~BPSOU-UR~~ USGS	—	—	↓	—	↓	98	19	209	780	680	<7	—
183	~~BPSOU-UR~~ SYSTEM Check	—	—	11/3/21	—		Time	56.1	Sec	RES	173.1		—
184	~~BPSOU-UR~~ SIO2	—	—		—		<3	12	<12	<3	<6	<5	—
185	~~BPSOU-UR~~ NIST	—	—		—		14	10	34	15	89	<6	—
186	~~BPSOU-UR~~ RCRA	—	—		—		492	508	22	469	45	<7	—
187	~~BPSOU-UR~~ USGS	—	—	↓	—		86	16	240	785	711	<7	—
188	BPSOU-UR01SS22-110221-2	2-6	7.81	11/2/21	1250	11/3/21	35	<6	4.2	22	96	(<7)	Yes

168* Charged battery
169* Change name, missing date
174* XRF wouldn't read results, shut off to restart
175* Still not working, charged battery on XRF

BPSOU: Unreclaimed Sites Field XRF and Soil pH Results

Site Number: UR01 Operator: C. Tucker
Land Use: Residential XRF Unit #: 98052
pH probe #: 1

*Reference 2021 UR Confirmation Sample Decision Tree for more information on declaring the need for a confirmation sample.

Soil Action/Screening Levels (mg/kg)						
Residential	250			1,200		10
Non-Residential				2,300		
Recreational	1,000					
Commercial	500					
Storm Water	200	20	1000	1000	1000	10

XRF Reading #	Sample Name	Depth (inches)	Soil pH (s.u.)	Date Collected	Time Collected	Date Analysed	XRF Results (mg/kg)						Lab Sample
							As	Cd	Cu	Pb	Zn	Hg	
189	BPSOU-UR01SS22-110221-3	6-12	7.05	11/2/21	1245	11/3/21	32	<7	60	25	92	<6	NO
190	BPSOU-UR01SS20-110221-1	0-2	6.76	11/2/21	1300	11/3/21	43	<7	68	31	95	<6	NO
191	BPSOU-UR01SS20-110221-2	2-6	6.93	"	1255	"	38	<7	53	19	93	<6	NO
192	BPSOU-UR01SS20-110221-3	6-12	6.40		1250		33	<7	46	16	91	<6	NO
193	BPSOU-UR01SS19-110221-1	0-2	7.27		1330		9	<8	71	61	196	<7	Yes
194	BPSOU-UR01SS19-110221-2	2-6	7.44		1325		13	<9	54	51	150	<8	Yes
195	BPSOU-UR01SS19-110221-3	6-12	6.56		1320		<9	10	49	49	179	<9	Yes
196	BPSOU-UR01SS18-110221-1	0-2	6.05		1315		12	<7	59	63	227	<7	Yes
197	BPSOU-UR01SS18-110221-2	2-6	6.60		1310		12	<8	70	35	163	<7	Yes
198	BPSOU-UR01SS18-110221-3	6-12	6.58		1305		9	<8	62	40	139	<7	Yes
199	BPSOU-UR01SS17-110221-1	0-2	6.37		1350		30	<7	49	23	104	<6	No
200	BPSOU-UR01SS17-110221-2	2-6	6.67		1345		33	<7	57	33	96	<6	NO
201	BPSOU-UR01SS17-110221-3	6-12	6.75		1340		30	<7	44	24	94	<6	NO
202	BPSOU-UR01SS16-110221-1	0-2	7.36		1345		31	<7	53	26	107	<6	NO DS
203	BPSOU-UR01SS16-110221-2	2-6	7.28		1340		24	<7	84	72	253	<7	~~NO~~ DS Yes
204	BPSOU-UR01SS16-110221-3	6-12	7.98		1335		21	<7	107	86	296	<7	~~NO~~ Yes
205	BPSOU-UR01SS15-110221-1	0-2	7.51		1315		24	8	102	362	502	<7	Yes
206	BPSOU-UR01SS15-110221-2	~~0-12~~ 2-6	6.93		1310		17	10	103	158	361	<7	~~Yes~~ DS Yes
207	BPSOU-UR01SS15-110221-2-RepSS	2-6	6.83		1310		14	<8	103	162	355	<7	~~Yes~~ DS
208	BPSOU-UR01SS15-110221-2-DupSS	2-6	6.83		1310		22	<8	121	361	443	<7	~~Yes~~ DS
209	~~BPSOU-UR~~ System Check	—	—	↓	—	↓	Time: 56.1			Res:	173.6	—	—

BPSOU: Unreclaimed Sites Field XRF and Soil pH Results

Site Number: UR01 Operator: 90852 K. Jackson
Land Use: Residential XRF Unit #: ↗ pH probe #: 1

*Reference 2021 UR Confirmation Sample Decision Tree for more information on declaring the need for a confirmation sample.

Soil Action/Screening Levels (mg/kg)						
Residential	250			1,200		10
Non-Residential				2,300		
Recreational	1,000					
Commercial	500					
Storm Water	200	20	1000	1000	1000	10

XRF Reading #	Sample Name	Depth (inches)	Soil pH (s.u.)	Date Collected	Time Collected	Date Analysed	XRF Results (mg/kg)						Lab Sample
							As	Cd	Cu	Pb	Zn	Hg	
210	~~BPSOU-UR~~ SiO2	—	—	11/3/21	—	—	<3	8	<11	<3	<6	<5	—
211	~~BPSOU-UR~~ NIST	—	—	↓	—	—	16	13	23	11	90	<6	—
212	~~BPSOU-UR~~ RCRA	—	—	↓	—	—	515	528	27	496	44	<7	—
213	~~BPSOU-UR~~ USGS	—	—	↓	—	—	94	22	229	790	710	<7	—
214	BPSOU-UR01SS06-110221-3	6-12	6.48	11/2/21	1305	11/3/21	10	13	91	48	298	(<7)	yes
215	BPSOU-UR01SS09-110221-1	0-2	6.39	↓	1440	↓	25	<6	53	21	100	<6	NO
216	BPSOU-UR01SS09-110221-2	2-6	6.66	↓	1435	↓	30	<7	48	19	98	<6	NO
217	BPSOU-UR01SS09-110221-3	6-12	6.95	↓	1430	↓	29	<7	56	18	103	<6	NO
218	BPSOU-UR01SS08-110221-1	0-2	7.20	↓	1435	↓	10	<7	76	20	121	(<7)	yes
219	BPSOU-UR01SS08-110221-2	2-6	7.32	↓	1430	↓	10	<8	63	24	114	(<7)	yes
220	BPSOU-UR01SS08-110221-3	6-12	7.20	↓	1425	↓	<7	10	31	28	102	(<9)	yes
221	BPSOU-UR01SS01-110221-1	0-2	8.50	↓	1315	↓	11	<7	47	13	75	<6	NO
222	BPSOU-UR01SS01-110221-2	2-6	8.15	↓	1310	↓	14	<7	26	12	74	<6	NO
223	BPSOU-UR01SS01-110221-3	6-12	8.58	↓	1305	↓	13	<7	43	20	77	<6	NO
224	BPSOU-UR01SS01-110221-1	0-2	8.55	↓	1529 1525	↓	9	8	61	26	157	<6	NO
225	BPSOU-UR01SS11-110221-2	2-6	7.98	↓	1520	↓	11	10	50	17	162	(<7)	yes
226	BPSOU-UR01SS11-110221-3	6-12	6.93	↓	1515	↓	18	<8	100	96	275	(<7)	yes
227	BPSOU-UR01SS10-110221-1	0-2	6.77	↓	1505	↓	14	<7	87	25	130	<6	NO
228	BPSOU-UR01SS10-110221-2	2-6	6.73	↓	1500	↓	14	<7	132	29	172	(<7)	yes
229	BPSOU-UR01SS10-110221-3	6-12	6.45	↓	1455	↓	11	<7	206	47	302	(<7)	yes
230	BPSOU-UR01SS13-110221-1	0-2	7.00	↓	1500	↓	11	11	49	23	129	(<8)	yes

BPSOU: Unreclaimed Sites Field XRF and Soil pH Results

Site Number: [redacted] Operator: K. Jackson
Land Use: Residential XRF Unit #: 98052
pH probe #: 1

*Reference 2021 UR Confirmation Sample Decision Tree for more information on declaring the need for a confirmation sample.

Soil Action/Screening Levels (mg/kg)						
Residential	250			1,200		10
Non-Residential				2,300		
Recreational	1,000					
Commercial	500					
Storm Water	200	20	1000	1000	1000	10

XRF Reading #	Sample Name	Depth (inches)	Soil pH (s.u.)	Date Collected	Time Collected	Date Analysed	XRF Results (mg/kg)						Lab Sample
							As	Cd	Cu	Pb	Zn	Hg	
230	BPSOU-UR 01SS13-110221-2	2-6	7.44	11/2/21	1455	11/3/21	<7	13	58	37	129	<7	yes
232	BPSOU-UR 01SS13-110221-3	6-12	6.90		1450		12	9	74	17	132	<7	yes
233	BPSOU-UR 01SS13-110221-3-Rep	6-12	6.96		1450		8	<7	66	13	134	<6	—
234	BPSOU-UR 01SS13-110221-3-Dup	6-12	6.90		1450		6	<7	59	14	134	<7	—
235	~~BPSOU-UR~~ System Check	—	—		—	—	Time: 5	6.1		Res:	1709	—	—
236	~~BPSOU-UR~~ SiO2	—	—		—		<2	15	<11	<3	<6	<5	—
237	~~BPSOU-UR~~ Nist	—	—		—		16	13	29	17	90	<6	—
238	~~BPSOU-UR~~ RCRA	—	—		—		446	518	30	480	46	<7	—
239	~~BPSOU-UR~~ USGS	—	—		—		82	16	215	805	732	<7	—
240	BPSOU-UR 01SS12-110221-1	0-2	7.14	11/2/21	1525	11/3/21	10	<8	64	58	158	<6	NO
241	BPSOU-UR 01SS12-110221-2	2-6	6.63	11/2/21	1520		19	28	38	18	146	<7	yes
242	BPSOU-UR 01SS12-110221-3	6-12	6.94	11/2/21	1515		6	8	75	18	193	<6	NO
243	BPSOU-UR 01SS01-110321-1	0-2	6.83	11/3/21	1025		<7	<7	71	49	131	<6	NO
244	BPSOU-UR 01SS01-110321-2	2-6	7.65		1020		11	<8	50	31	139	<7	yes
245	BPSOU-UR 01SS01-110321-3	6-12	7.21		1015		10	<8	79	26	187	<7	yes
246	BPSOU-UR 01SS01-110321-3-FD	6-12	7.21		1010		8	<8	74	22	138	<7	yes
247	BPSOU-UR 01SS02-110321-1	0-2	7.26		1030		8	<7	79	14	103	<6	NO
248	BPSOU-UR 01SS02-110321-2	2-6	7.75		1025		<5	11	55	13	102	<7	yes
249	BPSOU-UR 01SS02-110321-2-FD	2-6	7.72		1020		7	9	65	15	100	<7	yes
256	BPSOU-UR 01SS02-110321-3	6-12	7.34		1015		<6	<8	67	18	124	<6	NO
251	BPSOU-UR 01SS03-110321-1	0-2	7.33		945		11	<8	108	14	136	<7	yes

BPSOU: Unreclaimed Sites Field XRF and Soil pH Results

Site Number: SS201 Operator: K. Tackett
Land Use: Residential XRF Unit #: 98052
pH probe #: 1

*Reference 2021 UR Confirmation Sample Decision Tree for more information on declaring the need for a confirmation sample.

Soil Action/Screening Levels (mg/kg)						
Residential	250			1,200		10
Non-Residential				2,300		
Recreational	1,000					
Commercial	500					
Storm Water	200	20	1000	1000	1000	10

XRF Reading #	Sample Name	Depth (inch.)	Soil pH (s.u.)	Date Collected	Time Collected	Date Analysed	XRF Results (mg/kg)						Lab Sample
							As	Cd	Cu	Pb	Zn	Hg	
252	BPSOU-UR01SS03-110321-2	2-6	7.65	11/3/21	940	11/3/21	7	<6	73	21	165	<7	Yes
253	BPSOU-UR01SS03-110321-3	6-12	7.68		935		8	<8	81	26	153	<7	Yes
254	BPSOU-UR01SS04-110321-1	0-2	8.12		955		<6	<8	78	23	183	<7	Yes
255	BPSOU-UR01SS04-110321-2	2-6	8.44		950		10	<8	86	17	121	<7	Yes
256	BPSOU-UR01SS04-110321-3	6-12	8.28		945		6	8	63	12	114	<7	Yes
257	BPSOU-UR01SS05-110321-1	0-2	8.05		1105		16	<8	75	44	226	<7	Yes
258	BPSOU-UR01SS05-110321-2	2-6	6.83		1100		<14	<8	79	211	287	<7	Yes
259	BPSOU-UR01SS05-110321-2-Rep	2-6	6.83		1100		25	<8	69	306	269	<7	—
260	BPSOU-UR01SS05-110321-2-Dup	2-6	6.83		1100		9	<8	70	53	262	<7	—
261	~~BPSOU-UR~~ System Check	—	—		—		Time: 561 sec			Res: 173.3			—
262	~~BPSOU-UR~~ SiO2	—	—		—		<3	10	<11	<4	<5	<5	—
263	~~BPSOU-UR~~ NIST	—	—		—		16	<8	35	13	95	<7	—
264	~~BPSOU-UR~~ RCRA	—	—		—		489	528	28	481	47	<7	—
265	~~BPSOU-UR~~ USGS	—	—		—		78	20	218	792	703	<7	—
266	BPSOU-UR01SS05-110321-3	6-12	7.07		1055		13	<8	82	61	276	<7	Yes
267	BPSOU-UR01SS06-110321-1	0-2	7.67		1050		8	<8	64	18	124	<7	Yes
268	BPSOU-UR01SS07-110321-1-FD	0-2	7.51		1045		9	<7	54	29	108	<6	ND
269	BPSOU-UR01SS07-110321-2	2-6	7.54		1040		6	<8	56	10	101	<7	Yes
270	BPSOU-UR01SS07-110321-3	6-12	8.15		1035		7	9	58	17	112	<7	Yes
271	BPSOU-UR01SS06-110321-1	0-2	8.02		1055		8	<7	66	15	109	<7	Yes
272	BPSOU-UR01SS06-110321-1-FD	2-6	8.09		1100		7	9	66	20	112	<7	Yes

BPSOU: Unreclaimed Sites Field XRF and Soil pH Results

Site Number: UR01 Operator: K. Jackson
Land Use: Residential XRF Unit #: 98052
pH probe #: 1

*Reference 2021 UR Confirmation Sample Decision Tree for more information on declaring the need for a confirmation sample.

Soil Action/Screening Levels (mg/kg)						
Residential	250			1,200		10
Non-Residential				2,300		
Recreational	1,000					
Commercial	500					
Storm Water	200	20	1000	1000	1000	10

XRF Reading #	Sample Name	Depth (inches)	Soil pH (s.u.)	Date Collected	Time Collected	Date Analysed	XRF Results (mg/kg)						Lab Sample
							As	Cd	Cu	Pb	Zn	Hg	
273	BPSOU-UR 01SS06-110321-2	2-6	7.82	11/3/21	1050	11/3/21	8	<8	50	14	110	<8	YES
274	BPSOU-UR 01SS06-110321-3	6-12	7.82		1045		<6	<8	67	21	112	<6	NO
275	BPSOU-UR 01SS06-110321-3-R	6-12	7.82		1045		9	<8	61	19	120	<7	—
276	BPSOU-UR 01SS06-110321-3-D	6-12	7.82		1045		<6	<8	69	23	134	<7	—
277	~~BPSOU-UR~~ System Check	—			—		TIME: 54.1			Ref: 174.6			—
278	~~BPSOU-UR~~ SiO2	—			—		<3	9	<12	<3	<5	<5	—
279	~~BPSOU-UR~~ Nist	—			—		11	10	27	16	95	<6	—
280	~~BPSOU-UR~~ USGS	—			—		75	21	219	811	734	<7	—
281	~~BPSOU-UR~~ RCRA	—		↓	—	↓	495	516	21	470	50	<7	—
	BPSOU-UR												
	BPSOU-UR												
	BPSOU-UR												
	BPSOU-UR												
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Attachment C
Laboratory Data Packages

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

December 01, 2021

Scott Sampson
Pioneer Technical Services
1101 S. Montana Street
Butte, MT 59701

RE: Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Dear Scott Sampson:

Enclosed are the analytical results for sample(s) received by the laboratory on November 04, 2021. The results relate only to the samples included in this report. Results contained within this report conform to the most current version of the TNI standards, BP LaMP Technical Requirements Revision 12.1, and any applicable Quality Assurance Project Plan (QAPP), or Work Plan unless otherwise narrated in the body of this report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

This report was revised on December 1, 2021, to update the sample ID for Pace sample 10586297-009.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Pace Analytical Services, LLC - Minneapolis MN

1700 Elm Street SE, Minneapolis, MN 55414
A2LA Certification #: 2926.01*
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009*
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014*
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8 Tribal Water Systems+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605*
Georgia Certification #: 959
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086*
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064*
Maryland Certification #: 322
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137*
Minnesota Dept of Ag Approval: via MN 027-053-137
Minnesota Petrofund Registration #: 1240*
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081*
New Jersey Certification #: MN002
New York Certification #: 11647*
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification (1700) #: CL101
Ohio VAP Certification (1800) #: CL110*
Oklahoma Certification #: 9507*
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001*
Pennsylvania Certification #: 68-00563*
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192*
Utah Certification #: MN00064*
Vermont Certification #: VT-027053137
Virginia Certification #: 460163*
Washington Certification #: C486*
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208
*Please Note: Applicable air certifications are denoted with an asterisk (*).

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10586267001	**BPSOU-UR01SS27-110221-3**	Solid	11/02/21 11:50	11/04/21 10:00
10586267002	**BPSOU-UR01SS26-110221-2**	Solid	11/02/21 12:35	11/04/21 10:00
10586267003	**BPSOU-UR01SS26-110221-3**	Solid	11/02/21 12:30	11/04/21 10:00
10586267004	**BPSOU-UR01SS25-110221-1**	Solid	11/02/21 12:20	11/04/21 10:00
10586267005	**BPSOU-UR01SS25-110221-2**	Solid	11/02/21 12:10	11/04/21 10:00
10586267006	**BPSOU-UR01SS25-110221-1-FD**	Solid	11/02/21 12:15	11/04/21 10:00
10586267007	**BPSOU-UR01SS24-110221-1**	Solid	11/02/21 12:35	11/04/21 10:00
10586267008	**BPSOU-UR01SS23-110221-1**	Solid	11/02/21 12:25	11/04/21 10:00
10586267009	**BPSOU-UR01SS23-110221-2**	Solid	11/02/21 12:20	11/04/21 10:00
10586267010	**BPSOU-UR01SS23-110221-3**	Solid	11/02/21 12:15	11/04/21 10:00
10586267011	**BPSOU-UR01SS22-110221-2**	Solid	11/02/21 12:50	11/04/21 10:00
10586267012	**BPSOU-UR01SS21-110221-1**	Solid	11/02/21 12:35	11/04/21 10:00
10586267013	**BPSOU-UR01SS21-110221-2**	Solid	11/02/21 12:30	11/04/21 10:00
10586267014	**BPSOU-UR01SS21-110221-3**	Solid	11/02/21 12:25	11/04/21 10:00

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10586267001	BPSOU-UR01SS27-110221-3	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10586267002	BPSOU-UR01SS26-110221-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10586267003	BPSOU-UR01SS26-110221-3	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10586267004	BPSOU-UR01SS25-110221-1	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10586267005	BPSOU-UR01SS25-110221-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10586267006	BPSOU-UR01SS25-110221-1-FD	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10586267007	BPSOU-UR01SS24-110221-1	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10586267008	BPSOU-UR01SS23-110221-1	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10586267009	BPSOU-UR01SS23-110221-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10586267010	BPSOU-UR01SS23-110221-3	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10586267011	BPSOU-UR01SS22-110221-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10586267012	BPSOU-UR01SS21-110221-1	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10586267013	BPSOU-UR01SS21-110221-2	EPA 6010D	DM	5

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10586267014	**BPSOU-UR01SS21-110221-3**	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1

PASI-M = Pace Analytical Services - Minneapolis

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Method: **EPA 6010D**
Description: 6010D MET ICP
Client: BPAR-PIONEER-MT
Date: December 01, 2021

General Information:
14 samples were analyzed for EPA 6010D by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 781719

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10586267001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 4162705)
  - Zinc
- MSD (Lab ID: 4162706)
  - Lead
  - Zinc

Additional Comments:

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Method: **EPA 7471B**
Description: 7471B Mercury
Client: BPAR-PIONEER-MT
Date: December 01, 2021

General Information:
14 samples were analyzed for EPA 7471B by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 781724

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10586267001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 4162723)
  - Mercury
- MSD (Lab ID: 4162724)
  - Mercury

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Sample: BPSOU-UR01SS27-110221-3 **Lab ID: 10586267001** Collected: 11/02/21 11:50 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**6.1**	mg/kg	2.0	0.31	2	11/05/21 10:18	11/15/21 12:10	7440-38-2	
Cadmium	**0.35**	mg/kg	0.30	0.069	2	11/05/21 10:18	11/15/21 12:10	7440-43-9	
Copper	**64.5**	mg/kg	1.0	0.15	2	11/05/21 10:18	11/15/21 12:10	7440-50-8	
Lead	**25.3**	mg/kg	1.0	0.21	2	11/05/21 10:18	11/15/21 12:10	7439-92-1	M1
Zinc	**98.6**	mg/kg	4.0	0.45	2	11/05/21 10:18	11/15/21 12:10	7440-66-6	M1
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.034**	mg/kg	0.020	0.0088	1	11/05/21 11:11	11/16/21 13:02	7439-97-6	M1
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**4.6**	%	0.10	0.10	1		11/08/21 12:01		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Sample: BPSOU-UR01SS26-110221-2 **Lab ID: 10586267002** Collected: 11/02/21 12:35 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**14.8**	mg/kg	2.1	0.32	2	11/05/21 10:18	11/15/21 12:18	7440-38-2	
Cadmium	**2.8**	mg/kg	0.32	0.072	2	11/05/21 10:18	11/15/21 12:18	7440-43-9	
Copper	**77.7**	mg/kg	1.1	0.15	2	11/05/21 10:18	11/15/21 12:18	7440-50-8	
Lead	**148**	mg/kg	1.1	0.22	2	11/05/21 10:18	11/15/21 12:18	7439-92-1	
Zinc	**334**	mg/kg	4.2	0.47	2	11/05/21 10:18	11/15/21 12:18	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.092**	mg/kg	0.020	0.0088	1	11/05/21 11:11	11/16/21 13:07	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**7.7**	%	0.10	0.10	1		11/08/21 12:01		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Sample: BPSOU-UR01SS26-110221-3 **Lab ID: 10586267003** Collected: 11/02/21 12:30 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**15.5**	mg/kg	2.1	0.32	2	11/05/21 10:18	11/15/21 12:20	7440-38-2	
Cadmium	**1.9**	mg/kg	0.31	0.070	2	11/05/21 10:18	11/15/21 12:20	7440-43-9	
Copper	**92.5**	mg/kg	1.0	0.15	2	11/05/21 10:18	11/15/21 12:20	7440-50-8	
Lead	**288**	mg/kg	1.0	0.21	2	11/05/21 10:18	11/15/21 12:20	7439-92-1	
Zinc	**405**	mg/kg	4.1	0.46	2	11/05/21 10:18	11/15/21 12:20	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.21**	mg/kg	0.019	0.0084	1	11/05/21 11:11	11/16/21 13:08	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**5.8**	%	0.10	0.10	1		11/08/21 12:01		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Sample: BPSOU-UR01SS25-110221-1 **Lab ID: 10586267004** Collected: 11/02/21 12:20 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**7.1**	mg/kg	2.0	0.31	2	11/05/21 10:18	11/15/21 12:21	7440-38-2	
Cadmium	**0.49**	mg/kg	0.30	0.069	2	11/05/21 10:18	11/15/21 12:21	7440-43-9	
Copper	**55.4**	mg/kg	1.0	0.15	2	11/05/21 10:18	11/15/21 12:21	7440-50-8	
Lead	**54.2**	mg/kg	1.0	0.21	2	11/05/21 10:18	11/15/21 12:21	7439-92-1	
Zinc	**155**	mg/kg	4.1	0.45	2	11/05/21 10:18	11/15/21 12:21	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.052**	mg/kg	0.020	0.0086	1	11/05/21 11:11	11/16/21 13:10	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**8.0**	%	0.10	0.10	1		11/08/21 12:01		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Sample: BPSOU-UR01SS25-110221-2 **Lab ID: 10586267005** Collected: 11/02/21 12:10 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**6.9**	mg/kg	1.2	0.18	1	11/05/21 10:18	11/15/21 11:41	7440-38-2	
Cadmium	**0.44**	mg/kg	0.18	0.040	1	11/05/21 10:18	11/15/21 11:41	7440-43-9	
Copper	**55.5**	mg/kg	0.59	0.086	1	11/05/21 10:18	11/15/21 11:41	7440-50-8	
Lead	**58.9**	mg/kg	0.59	0.12	1	11/05/21 10:18	11/15/21 11:41	7439-92-1	
Zinc	**149**	mg/kg	2.3	0.26	1	11/05/21 10:18	11/15/21 11:41	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.042**	mg/kg	0.023	0.0098	1	11/05/21 11:11	11/16/21 13:12	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**19.6**	%	0.10	0.10	1		11/08/21 12:02		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
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(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Sample: BPSOU-UR01SS25-110221-1-FD **Lab ID: 10586267006** Collected: 11/02/21 12:15 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**4.8**	mg/kg	1.0	0.16	1	11/05/21 10:18	11/15/21 11:43	7440-38-2	
Cadmium	**0.33**	mg/kg	0.16	0.035	1	11/05/21 10:18	11/15/21 11:43	7440-43-9	
Copper	**42.3**	mg/kg	0.52	0.076	1	11/05/21 10:18	11/15/21 11:43	7440-50-8	
Lead	**54.7**	mg/kg	0.52	0.11	1	11/05/21 10:18	11/15/21 11:43	7439-92-1	
Zinc	**113**	mg/kg	2.1	0.23	1	11/05/21 10:18	11/15/21 11:43	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.033**	mg/kg	0.020	0.0089	1	11/05/21 11:11	11/16/21 13:16	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**8.4**	%	0.10	0.10	1		11/08/21 12:02		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Sample: BPSOU-UR01SS24-110221-1 **Lab ID: 10586267007** Collected: 11/02/21 12:35 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**6.4**	mg/kg	2.1	0.32	2	11/05/21 10:18	11/15/21 12:26	7440-38-2	
Cadmium	**0.50**	mg/kg	0.31	0.071	2	11/05/21 10:18	11/15/21 12:26	7440-43-9	
Copper	**49.5**	mg/kg	1.0	0.15	2	11/05/21 10:18	11/15/21 12:26	7440-50-8	
Lead	**47.3**	mg/kg	1.0	0.22	2	11/05/21 10:18	11/15/21 12:26	7439-92-1	
Zinc	**147**	mg/kg	4.2	0.47	2	11/05/21 10:18	11/15/21 12:26	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.069**	mg/kg	0.020	0.0086	1	11/05/21 11:11	11/16/21 13:18	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**8.8**	%	0.10	0.10	1		11/08/21 12:02		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Sample: BPSOU-UR01SS23-110221-1 **Lab ID: 10586267008** Collected: 11/02/21 12:25 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**31.3**	mg/kg	2.0	0.31	2	11/05/21 10:18	11/15/21 12:28	7440-38-2	
Cadmium	**9.4**	mg/kg	0.30	0.068	2	11/05/21 10:18	11/15/21 12:28	7440-43-9	
Copper	**180**	mg/kg	1.0	0.15	2	11/05/21 10:18	11/15/21 12:28	7440-50-8	
Lead	**656**	mg/kg	1.0	0.21	2	11/05/21 10:18	11/15/21 12:28	7439-92-1	
Zinc	**2010**	mg/kg	4.0	0.45	2	11/05/21 10:18	11/15/21 12:28	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.61**	mg/kg	0.019	0.0085	1	11/05/21 11:11	11/16/21 13:20	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**6.7**	%	0.10	0.10	1		11/08/21 12:02		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Sample: BPSOU-UR01SS23-110221-2 **Lab ID: 10586267009** Collected: 11/02/21 12:20 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**60.1**	mg/kg	10.7	1.6	10	11/05/21 10:18	11/15/21 12:30	7440-38-2	
Cadmium	**79.2**	mg/kg	1.6	0.37	10	11/05/21 10:18	11/15/21 12:30	7440-43-9	
Copper	**569**	mg/kg	5.4	0.78	10	11/05/21 10:18	11/15/21 12:30	7440-50-8	
Lead	**2850**	mg/kg	5.4	1.1	10	11/05/21 10:18	11/15/21 12:30	7439-92-1	
Zinc	**22800**	mg/kg	21.4	2.4	10	11/05/21 10:18	11/15/21 12:30	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**2.4**	mg/kg	0.19	0.082	10	11/05/21 11:11	11/16/21 15:32	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**9.4**	%	0.10	0.10	1		11/08/21 12:02		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Sample: BPSOU-UR01SS23-110221-3 **Lab ID: 10586267010** Collected: 11/02/21 12:15 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**51.7**	mg/kg	2.1	0.33	2	11/05/21 10:18	11/15/21 12:31	7440-38-2	
Cadmium	**6.0**	mg/kg	0.32	0.073	2	11/05/21 10:18	11/15/21 12:31	7440-43-9	
Copper	**285**	mg/kg	1.1	0.16	2	11/05/21 10:18	11/15/21 12:31	7440-50-8	
Lead	**1340**	mg/kg	1.1	0.22	2	11/05/21 10:18	11/15/21 12:31	7439-92-1	
Zinc	**1310**	mg/kg	4.3	0.48	2	11/05/21 10:18	11/15/21 12:31	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**1.2**	mg/kg	0.039	0.017	2	11/05/21 11:11	11/16/21 15:33	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**12.1**	%	0.10	0.10	1		11/08/21 12:03		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Sample: BPSOU-UR01SS22-110221-2 **Lab ID: 10586267011** Collected: 11/02/21 12:50 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**22.2**	mg/kg	1.1	0.16	1	11/05/21 10:18	11/15/21 11:51	7440-38-2	
Cadmium	**0.49**	mg/kg	0.16	0.036	1	11/05/21 10:18	11/15/21 11:51	7440-43-9	
Copper	**30.4**	mg/kg	0.53	0.077	1	11/05/21 10:18	11/15/21 11:51	7440-50-8	
Lead	**12.7**	mg/kg	0.53	0.11	1	11/05/21 10:18	11/15/21 11:51	7439-92-1	
Zinc	**42.0**	mg/kg	2.1	0.24	1	11/05/21 10:18	11/15/21 11:51	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.029**	mg/kg	0.020	0.0088	1	11/05/21 11:11	11/16/21 13:25	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**7.4**	%	0.10	0.10	1		11/08/21 12:03		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Sample: BPSOU-UR01SS21-110221-1 **Lab ID: 10586267012** Collected: 11/02/21 12:35 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**195**	mg/kg	1.1	0.16	1	11/05/21 10:18	11/15/21 11:53	7440-38-2	
Cadmium	**0.82**	mg/kg	0.16	0.037	1	11/05/21 10:18	11/15/21 11:53	7440-43-9	
Copper	**398**	mg/kg	0.54	0.079	1	11/05/21 10:18	11/15/21 11:53	7440-50-8	
Lead	**119**	mg/kg	0.54	0.11	1	11/05/21 10:18	11/15/21 11:53	7439-92-1	
Zinc	**271**	mg/kg	2.1	0.24	1	11/05/21 10:18	11/15/21 11:53	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.25**	mg/kg	0.020	0.0088	1	11/05/21 11:11	11/16/21 13:26	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**10.5**	%	0.10	0.10	1		11/08/21 12:03		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Sample: BPSOU-UR01SS21-110221-2 **Lab ID: 10586267013** Collected: 11/02/21 12:30 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**158**	mg/kg	1.1	0.17	1	11/05/21 10:18	11/15/21 11:54	7440-38-2	
Cadmium	**0.25**	mg/kg	0.16	0.037	1	11/05/21 10:18	11/15/21 11:54	7440-43-9	
Copper	**224**	mg/kg	0.54	0.079	1	11/05/21 10:18	11/15/21 11:54	7440-50-8	
Lead	**35.6**	mg/kg	1.1	0.22	2	11/05/21 10:18	11/15/21 12:33	7439-92-1	
Zinc	**96.3**	mg/kg	2.2	0.24	1	11/05/21 10:18	11/15/21 11:54	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.27**	mg/kg	0.019	0.0082	1	11/05/21 11:11	11/16/21 13:28	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**9.6**	%	0.10	0.10	1		11/08/21 12:03		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Sample: BPSOU-UR01SS21-110221-3 **Lab ID: 10586267014** Collected: 11/02/21 12:25 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**167**	mg/kg	1.1	0.16	1	11/05/21 10:18	11/15/21 11:56	7440-38-2	
Cadmium	**0.14J**	mg/kg	0.16	0.036	1	11/05/21 10:18	11/15/21 11:56	7440-43-9	
Copper	**241**	mg/kg	0.53	0.078	1	11/05/21 10:18	11/15/21 11:56	7440-50-8	
Lead	**18.2**	mg/kg	0.53	0.11	1	11/05/21 10:18	11/15/21 11:56	7439-92-1	
Zinc	**60.0**	mg/kg	2.1	0.24	1	11/05/21 10:18	11/15/21 11:56	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.062**	mg/kg	0.019	0.0083	1	11/05/21 11:11	11/16/21 13:29	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**10**	%	0.10	0.10	1		11/08/21 12:03		N2

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

QC Batch: 781724 — Analysis Method: EPA 7471B
QC Batch Method: EPA 7471B — Analysis Description: 7471B Mercury Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10586267001, 10586267002, 10586267003, 10586267004, 10586267005, 10586267006, 10586267007, 10586267008, 10586267009, 10586267010, 10586267011, 10586267012, 10586267013, 10586267014

METHOD BLANK: 4162721 — Matrix: Solid
Associated Lab Samples: 10586267001, 10586267002, 10586267003, 10586267004, 10586267005, 10586267006, 10586267007, 10586267008, 10586267009, 10586267010, 10586267011, 10586267012, 10586267013, 10586267014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	<0.0084	0.019	0.0084	11/16/21 12:59	

LABORATORY CONTROL SAMPLE: 4162722

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.48	0.50	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4162723 4162724

Parameter	Units	10586267001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.034	0.47	0.45	0.30	0.33	55	66	80-120	11	20	M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

QC Batch: 781719
QC Batch Method: EPA 3050B
Analysis Method: EPA 6010D
Analysis Description: 6010D Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10586267001, 10586267002, 10586267003, 10586267004, 10586267005, 10586267006, 10586267007, 10586267008, 10586267009, 10586267010, 10586267011, 10586267012, 10586267013, 10586267014

METHOD BLANK: 4162703 Matrix: Solid
Associated Lab Samples: 10586267001, 10586267002, 10586267003, 10586267004, 10586267005, 10586267006, 10586267007, 10586267008, 10586267009, 10586267010, 10586267011, 10586267012, 10586267013, 10586267014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/kg	<0.15	0.99	0.15	11/15/21 11:21	
Cadmium	mg/kg	<0.034	0.15	0.034	11/15/21 11:21	
Copper	mg/kg	<0.072	0.50	0.072	11/15/21 11:21	
Lead	mg/kg	<0.10	0.50	0.10	11/15/21 11:21	
Zinc	mg/kg	<0.22	2.0	0.22	11/15/21 11:21	

LABORATORY CONTROL SAMPLE: 4162704

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	49.5	47.8	97	80-120	
Cadmium	mg/kg	49.5	49.6	100	80-120	
Copper	mg/kg	49.5	49.0	99	80-120	
Lead	mg/kg	49.5	48.8	99	80-120	
Zinc	mg/kg	49.5	48.1	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4162705 4162706

Parameter	Units	10586267001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	6.1	50.4	51.4	48.8	49.3	85	84	75-125	1	20	
Cadmium	mg/kg	0.35	50.4	51.4	44.6	45.3	88	88	75-125	2	20	
Copper	mg/kg	64.5	50.4	51.4	106	115	82	98	75-125	8	20	
Lead	mg/kg	25.3	50.4	51.4	65.3	62.1	79	71	75-125	5	20	M1
Zinc	mg/kg	98.6	50.4	51.4	123	128	49	58	75-125	4	20	M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

QC Batch: 782117
QC Batch Method: ASTM D2974
Analysis Method: ASTM D2974
Analysis Description: Dry Weight / %M by ASTM D2974
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10586267001, 10586267002, 10586267003, 10586267004, 10586267005, 10586267006, 10586267007, 10586267008, 10586267009, 10586267010, 10586267011, 10586267012, 10586267013, 10586267014

SAMPLE DUPLICATE: 4164948

Parameter	Units	10586267001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	4.6	4.2	9	30	N2

SAMPLE DUPLICATE: 4164949

Parameter	Units	10586267011 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	7.4	7.2	3	30	N2

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
N2	The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BPSOU Unreclaimed Sampling-Revised Report
Pace Project No.: 10586267

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10586267001	**BPSOU-UR01SS27-110221-3**	EPA 3050B	781719	EPA 6010D	782097
10586267002	**BPSOU-UR01SS26-110221-2**	EPA 3050B	781719	EPA 6010D	782097
10586267003	**BPSOU-UR01SS26-110221-3**	EPA 3050B	781719	EPA 6010D	782097
10586267004	**BPSOU-UR01SS25-110221-1**	EPA 3050B	781719	EPA 6010D	782097
10586267005	**BPSOU-UR01SS25-110221-2**	EPA 3050B	781719	EPA 6010D	782097
10586267006	**BPSOU-UR01SS25-110221-1-FD**	EPA 3050B	781719	EPA 6010D	782097
10586267007	**BPSOU-UR01SS24-110221-1**	EPA 3050B	781719	EPA 6010D	782097
10586267008	**BPSOU-UR01SS23-110221-1**	EPA 3050B	781719	EPA 6010D	782097
10586267009	**BPSOU-UR01SS23-110221-2**	EPA 3050B	781719	EPA 6010D	782097
10586267010	**BPSOU-UR01SS23-110221-3**	EPA 3050B	781719	EPA 6010D	782097
10586267011	**BPSOU-UR01SS22-110221-2**	EPA 3050B	781719	EPA 6010D	782097
10586267012	**BPSOU-UR01SS21-110221-1**	EPA 3050B	781719	EPA 6010D	782097
10586267013	**BPSOU-UR01SS21-110221-2**	EPA 3050B	781719	EPA 6010D	782097
10586267014	**BPSOU-UR01SS21-110221-3**	EPA 3050B	781719	EPA 6010D	782097
10586267001	**BPSOU-UR01SS27-110221-3**	EPA 7471B	781724	EPA 7471B	782474
10586267002	**BPSOU-UR01SS26-110221-2**	EPA 7471B	781724	EPA 7471B	782474
10586267003	**BPSOU-UR01SS26-110221-3**	EPA 7471B	781724	EPA 7471B	782474
10586267004	**BPSOU-UR01SS25-110221-1**	EPA 7471B	781724	EPA 7471B	782474
10586267005	**BPSOU-UR01SS25-110221-2**	EPA 7471B	781724	EPA 7471B	782474
10586267006	**BPSOU-UR01SS25-110221-1-FD**	EPA 7471B	781724	EPA 7471B	782474
10586267007	**BPSOU-UR01SS24-110221-1**	EPA 7471B	781724	EPA 7471B	782474
10586267008	**BPSOU-UR01SS23-110221-1**	EPA 7471B	781724	EPA 7471B	782474
10586267009	**BPSOU-UR01SS23-110221-2**	EPA 7471B	781724	EPA 7471B	782474
10586267010	**BPSOU-UR01SS23-110221-3**	EPA 7471B	781724	EPA 7471B	782474
10586267011	**BPSOU-UR01SS22-110221-2**	EPA 7471B	781724	EPA 7471B	782474
10586267012	**BPSOU-UR01SS21-110221-1**	EPA 7471B	781724	EPA 7471B	782474
10586267013	**BPSOU-UR01SS21-110221-2**	EPA 7471B	781724	EPA 7471B	782474
10586267014	**BPSOU-UR01SS21-110221-3**	EPA 7471B	781724	EPA 7471B	782474
10586267001	**BPSOU-UR01SS27-110221-3**	ASTM D2974	782117		
10586267002	**BPSOU-UR01SS26-110221-2**	ASTM D2974	782117		
10586267003	**BPSOU-UR01SS26-110221-3**	ASTM D2974	782117		
10586267004	**BPSOU-UR01SS25-110221-1**	ASTM D2974	782117		
10586267005	**BPSOU-UR01SS25-110221-2**	ASTM D2974	782117		
10586267006	**BPSOU-UR01SS25-110221-1-FD**	ASTM D2974	782117		
10586267007	**BPSOU-UR01SS24-110221-1**	ASTM D2974	782117		
10586267008	**BPSOU-UR01SS23-110221-1**	ASTM D2974	782117		
10586267009	**BPSOU-UR01SS23-110221-2**	ASTM D2974	782117		
10586267010	**BPSOU-UR01SS23-110221-3**	ASTM D2974	782117		
10586267011	**BPSOU-UR01SS22-110221-2**	ASTM D2974	782117		
10586267012	**BPSOU-UR01SS21-110221-1**	ASTM D2974	782117		
10586267013	**BPSOU-UR01SS21-110221-2**	ASTM D2974	782117		
10586267014	**BPSOU-UR01SS21-110221-3**	ASTM D2974	782117		

REPORT OF LABORATORY ANALYSIS

Laboratory Management Program (LaMP) Chain of Custody Record
Soil, Sediment and Groundwater Samples

BP Site Node Path: _____ Req Due Date (mm/dd/yy): 11/17/21 Rush TAT Yes 14 day No _____

BP/RM Facility No: _____ Lab Work Order Number: _____

Lab Name: Pace Analytical	BP/ARC Facility Address:	Consultant/Contractor:	Pioneer Technical Services
Lab Address: 1700 Elm Street SE, Minneapolis, MN 55414	City, State, ZIP Code:	Consultant/Contractor Project No:	BPSOU Unreclaimed Sampling
Lab PM: Jennifer Anderson	Lead Regulatory Agency:	Address:	1101 S. Montana St.
Lab Phone: 612-607-6436	California Global ID No.:	Consultant/Contractor PM:	Scott Sampson
Lab Shipping Accnt:	Enfos Proposal No:	Phone: 406-697-0946 Email:	ssampson@pioneer-technical.com
Lab Bottle Order No:	Accounting Mode: Provision ____ OOC-BU ____ OOC-RM ____	Send/Submit EDD to:	Scott Sampson
Other Info:	Stage Activity	Invoice To:	BP-RM _____ BP-Other _____

BP/RM PM: Mike Mc Anulty

PM Phone: 406-723-1822

PM Email: mcanumc@bp.com

Requested Analyses

Report Type & QC Level

Limited (Standard) Package ___

Limited Plus Package ___

Full Package Level 2

WO# : 10586267

10586267

Lab No.	Unique Sample ID, must follow format of SAMPLENAMEYYYYMMDD Examples: MW01_20190101; BH01_3-5_20190101	Time	Depth Unit	Grab (G) or Composite (C)	Total Number of Containers	Matrix	Analysis	Total Metals 6010 As, Cd, Cu, Pb, Zn	7471 Mercury	Filtered (Y/N)	Preservation	
	BPSOU-UR01SS27-110221-3	11:50	in	c	1	soil		x	x			001
	BPSOU-UR01SS26-110221-2	12:35	in	c	1	soil		x	x			002
	BPSOU-UR01SS26-110221-3	12:30	in	c	1	soil		x	x			003
	BPSOU-UR01SS25-110221-1	12:20	in	c	1	soil		x	x			004
	BPSOU-UR01SS25-110221-2	12:10	in	c	1	soil		x	x			005
	BPSOU-UR01SS25-110221-1-FD	12:15	in	c	1	soil		x	x			006
	BPSOU-UR01SS24-110221-1	12:35	in	c	1	soil		x	x			007

		Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Name:	Jesse Sims	Jesse Sims/PTS	11/3/2021	1600	ACPACE	11/04/21	10:00
Sampler's Company:	Pioneer Technical Services						
Ship Method:	FedEx Overnight 11/3/2021						
Shipment Tracking No:	4278 9934 6440						

Special Instructions: *Maximum 14 day TAT

THIS LINE - LAB USE ONLY: Custody Seals In Place: (Yes) / No | Temp Blank: (Yes) / No | Cooler Temp on Receipt: 1.4 °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

BP LaMP Soil/H2O COC March 2019

Laboratory Management Program (LaMP) Chain of Custody Record
Soil, Sediment and Groundwater Samples

BP Site Node Path: _____ Req Due Date (mm/dd/yy): 11/17/21 Rush TAT Yes 14 day No _____

BP/RM Facility No: _____ Lab Work Order Number: _____

Lab Name:	Pace Analytical	BP/ARC Facility Address:		Consultant/Contractor:	Pioneer Technical Services
Lab Address:	1700 Elm Street SE, Minneapolis, MN 55414	City, State, ZIP Code:		Consultant/Contractor Project No:	BPSOU Unreclaimed Sampling
Lab PM:	Jennifer Anderson	Lead Regulatory Agency:		Address:	1101 S. Montana St.
Lab Phone:	612-607-6436	California Global ID No.:		Consultant/Contractor PM:	Scott Sampson
Lab Shipping Accnt:		Enfos Proposal No:		Phone: 406-697-0946 Email:	ssampson@pioneer-technical.com
Lab Bottle Order No:		Accounting Mode: Provision ____ OOC-BU ____ OOC-RM ____		Send/Submit EDD to:	Scott Sampson
Other Info:		Stage	Activity	Invoice To:	BP-RM ____ BP-Other ____

BP/RM PM:	Mike Mc Anulty
PM Phone:	406-723-1822
PM Email:	mcanumc@bp.com

Requested Analyses

Report Type & QC Level

Limited (Standard) Package ___

Limited Plus Package ___

Full Package Level 2

Lab No.	Unique Sample ID, must follow format of SAMPLENAMEYYYYMMDD Examples: MW01_20190101; BH01_3-5_20190101	Time	Depth Unit	Grab (G) or Composite (C)	Total Number of Containers	Matrix	Analysis	Total Metals 6010 As, Cd, Cu, Pb, Zn	7471 Mercury	Comments
	BPSOU-UR01SS23-110221-1	12:25	in	c	1	soil		x	x	008
	BPSOU-UR01SS23-110221-2	12:20	in	c	1	soil		x	x	009
	BPSOU-UR01SS23-110221-3	12:15	in	c	1	soil		x	x	010
	BPSOU-UR01SS22-110221-2	12:50	in	c	1	soil		x	x	011
	BPSOU-UR01SS21-110221-1	12:35	in	c	1	soil		x	x	012
	BPSOU-UR01SS21-110221-2	12:30								013
	BPSOU-UR01SS21-110221-3	12:25								014

		Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Name:	Jesse Sims						
Sampler's Company:	Pioneer Technical Services	Jesse Sims/PTS	11/3/2021	1600	AC/PACE	11/04/21	10:00
Ship Method:	FedEx Overnight 11/3/2021						
Shipment Tracking No:	4278 9934 6440						

Special Instructions: *Maximum 14 day TAT

THIS LINE - LAB USE ONLY: Custody Seals In Place: (Yes) / No | Temp Blank: (Yes) / No | Cooler Temp on Receipt: 1.4 °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

BP LaMP Soil/H2O COC March 2019

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - ESI**	Document Revised: 12Aug2020 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0149 Rev.01**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt – ESI Tech Specs

Client Name: PIONEER TECHNICAL SERVICES

Project #: **WO#: 10586267**

PM: JMA Due Date: 11/17/21

CLIENT: BP-PIONEER

Courier: ☒Fed Ex ☐UPS ☐USPS ☐Client ☐Pace ☐SpeeDee ☐Commercial

Tracking Number: 427899346440 See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☒Yes ☐No **Seals Intact?** ☒Yes ☐No **Biological Tissue Frozen?** ☐Yes ☐No ☐N/A

Packing Material: ☒Bubble Wrap ☒Bubble Bags ☐None ☐Other:_____ **Temp Blank?** ☒Yes ☐No

Thermometer: ☐T1(0461) ☐T2(1336) ☐T3(0459) ☒T4(0254) ☐T5(0489) **Type of Ice:** ☒Wet ☐Blue ☐None ☐Dry ☐Melted

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 1.4 °C **Average Corrected Temp (no temp blank only):** _____ °C ☐See Exceptions ENV-FRM-MIN4-0142 ☐1 Container

Correction Factor: 1.000 **Cooler Temp Corrected w/temp blank:** 1.4 °C

USDA Regulated Soil: (☐ N/A, water sample/Other:_____)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐Yes ☒No

Date/Initials of Person Examining Contents: AC 11/10/21
Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐Yes ☒No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☒Yes	☐No		1.
Chain of Custody Relinquished?	☒Yes	☐No		2.
Sampler Name and/or Signature on COC?	☒Yes	☐No	☐N/A	3.
Samples Arrived within Hold Time?	☒Yes	☐No		4.
Short Hold Time Analysis (<72 hr)?	☐Yes	☒No		5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐
Rush Turn Around Time Requested?	☐Yes	☒No		6.
Sufficient Sample Volume?	☒Yes	☐No		7.
Triple Volume Provided for MS/MSD (if more than 10 samples)?	☐Yes	☒No	☒N/A	
Correct Containers Used?	☒Yes	☐No		8.
-Pace Containers Used?	☐Yes	☒No		
Containers Intact?	☒Yes	☐No		9.
Field Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☒N/A	10. Is sediment visible in the dissolved container? ☐Yes ☐No
Is sufficient information available to reconcile the samples to the COC	☒Yes	☐No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ ENV-FRM-MIN4-0142
Matrix: ☐Water ☒Soil ☐Oil ☐Other_____				
All containers needing acid/base preservation have been checked?	☐Yes	☐No	☒N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐Yes	☐No	☒N/A	☐NaOH ☐HNO_3 ☐H_2SO_4 ☐Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS *If adding preservative to a container it must be added to associated field and equipment blanks (verify with PM first)	☐Yes	☐No	☒N/A	Positive for Res. Chlorine? ☐Yes ☐No **pH Paper Lot#** **See Exception** ☐ ENV-FRM-MIN4-0142
				Res. Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO contaners?	☐Yes	☐No	☒N/A	13. **See Exception** ☐ ENV-FRM-MIN4-0140
Headspace in VOA Vials (greater than 6mm)?	☐Yes	☐No	☒N/A	
3 Trip Blanks Present?	☐Yes	☐No	☒N/A	14.
Trip Blank Custody Seals Present?	☐Yes	☐No	☒N/A	Pace Trip Blank Lot # (if purchased):_____

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins			
Opened Time: 1230	Temp: 1.4	Corrected Temp: 1.4	
Time:	put in cooler		
Time: 1250	Temp: 1.4	Corrected Temp: 1.4	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: _____ **Date:** 11/07/2021

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Labeled by: _____

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

November 17, 2021

Scott Sampson
Pioneer Technical Services
1101 S. Montana Street
Butte, MT 59701

RE: Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Dear Scott Sampson:

Enclosed are the analytical results for sample(s) received by the laboratory on November 04, 2021. The results relate only to the samples included in this report. Results contained within this report conform to the most current version of the TNI standards, BP LaMP Technical Requirements Revision 12.1, and any applicable Quality Assurance Project Plan (QAPP), or Work Plan unless otherwise narrated in the body of this report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Pace Analytical Services, LLC - Minneapolis MN

1700 Elm Street SE, Minneapolis, MN 55414
A2LA Certification #: 2926.01*
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009*
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014*
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8 Tribal Water Systems+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605*
Georgia Certification #: 959
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086*
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064*
Maryland Certification #: 322
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137*
Minnesota Dept of Ag Approval: via MN 027-053-137
Minnesota Petrofund Registration #: 1240*
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081*
New Jersey Certification #: MN002
New York Certification #: 11647*
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification (1700) #: CL101
Ohio VAP Certification (1800) #: CL110*
Oklahoma Certification #: 9507*
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001*
Pennsylvania Certification #: 68-00563*
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192*
Utah Certification #: MN00064*
Vermont Certification #: VT-027053137
Virginia Certification #: 460163*
Washington Certification #: C486*
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208
*Please Note: Applicable air certifications are denoted with an asterisk (*).

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10586277001	**BPSOU-UR01SS19-110221-1**	Solid	11/02/21 13:30	11/04/21 10:00
10586277002	**BPSOU-UR01SS19-110221-2**	Solid	11/02/21 13:25	11/04/21 10:00
10586277003	**BPSOU-UR01SS19-110221-3**	Solid	11/02/21 13:20	11/04/21 10:00
10586277004	**BPSOU-UR01SS18-110221-1**	Solid	11/02/21 13:15	11/04/21 10:00
10586277005	**BPSOU-UR01SS18-110221-2**	Solid	11/02/21 13:10	11/04/21 10:00
10586277006	**BPSOU-UR01SS18-110221-3**	Solid	11/02/21 13:05	11/04/21 10:00
10586277007	**BPSOU-UR01SS16-110221-2**	Solid	11/02/21 13:40	11/04/21 10:00
10586277008	**BPSOU-UR01SS16-110221-3**	Solid	11/02/21 13:35	11/04/21 10:00
10586277009	**BPSOU-UR01SS15-110221-1**	Solid	11/02/21 13:15	11/04/21 10:00
10586277010	**BPSOU-UR01SS15-110221-2**	Solid	11/02/21 13:10	11/04/21 10:00
10586277011	**BPSOU-UR01SS15-110221-3**	Solid	11/02/21 13:05	11/04/21 10:00
10586277012	**BPSOU-UR01SS01-110321-2**	Solid	11/03/21 10:20	11/04/21 10:00
10586277013	**BPSOU-UR01SS01-110321-3**	Solid	11/03/21 10:15	11/04/21 10:00
10586277014	**BPSOU-UR01SS01-110321-3-FD**	Solid	11/03/21 10:10	11/04/21 10:00

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10586277001	BPSOU-UR01SS19-110221-1	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586277002	BPSOU-UR01SS19-110221-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586277003	BPSOU-UR01SS19-110221-3	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586277004	BPSOU-UR01SS18-110221-1	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586277005	BPSOU-UR01SS18-110221-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586277006	BPSOU-UR01SS18-110221-3	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586277007	BPSOU-UR01SS16-110221-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586277008	BPSOU-UR01SS16-110221-3	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586277009	BPSOU-UR01SS15-110221-1	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586277010	BPSOU-UR01SS15-110221-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586277011	BPSOU-UR01SS15-110221-3	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586277012	BPSOU-UR01SS01-110321-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586277013	BPSOU-UR01SS01-110321-3	EPA 6010D	DM	5

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SAMPLE ANALYTE COUNT

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586277014	**BPSOU-UR01SS01-110321-3-FD**	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1

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PROJECT NARRATIVE

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Method: **EPA 6010D**
Description: 6010D MET ICP
Client: BPAR-PIONEER-MT
Date: November 17, 2021

General Information:
14 samples were analyzed for EPA 6010D by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 782084

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10586277001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 4164875)
  - Lead
  - Zinc
- MSD (Lab ID: 4164876)
  - Lead
  - Zinc

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Method: **EPA 7471B**
Description: 7471B Mercury
Client: BPAR-PIONEER-MT
Date: November 17, 2021

General Information:
14 samples were analyzed for EPA 7471B by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 782131

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10586277001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MSD (Lab ID: 4164993)
  - Mercury

R1: RPD value was outside control limits.

- MSD (Lab ID: 4164993)
  - Mercury

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Sample: BPSOU-UR01SS19-110221-1 **Lab ID: 10586277001** Collected: 11/02/21 13:30 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**5.0**	mg/kg	2.0	0.30	2	11/09/21 13:35	11/15/21 13:18	7440-38-2	
Cadmium	**0.33**	mg/kg	0.29	0.067	2	11/09/21 13:35	11/15/21 13:18	7440-43-9	
Copper	**49.9**	mg/kg	0.98	0.14	2	11/09/21 13:35	11/15/21 13:18	7440-50-8	
Lead	**39.4**	mg/kg	0.98	0.20	2	11/09/21 13:35	11/15/21 13:18	7439-92-1	M1
Zinc	**114**	mg/kg	3.9	0.44	2	11/09/21 13:35	11/15/21 13:18	7440-66-6	M1
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.051**	mg/kg	0.021	0.0092	1	11/10/21 08:31	11/16/21 14:15	7439-97-6	M1,R1
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**5.2**	%	0.10	0.10	1		11/08/21 09:03		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Sample: BPSOU-UR01SS19-110221-2 **Lab ID: 10586277002** Collected: 11/02/21 13:25 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**5.0**	mg/kg	1.0	0.16	1	11/09/21 13:35	11/15/21 12:51	7440-38-2	
Cadmium	**0.30**	mg/kg	0.15	0.035	1	11/09/21 13:35	11/15/21 12:51	7440-43-9	
Copper	**50.2**	mg/kg	0.51	0.074	1	11/09/21 13:35	11/15/21 12:51	7440-50-8	
Lead	**39.1**	mg/kg	1.0	0.21	2	11/09/21 13:35	11/15/21 13:30	7439-92-1	
Zinc	**97.2**	mg/kg	2.0	0.23	1	11/09/21 13:35	11/15/21 12:51	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.057**	mg/kg	0.019	0.0083	1	11/10/21 08:31	11/16/21 14:20	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**5.2**	%	0.10	0.10	1		11/08/21 09:03		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Sample: BPSOU-UR01SS19-110221-3 **Lab ID: 10586277003** Collected: 11/02/21 13:20 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**4.0**	mg/kg	0.97	0.15	1	11/09/21 13:35	11/15/21 12:53	7440-38-2	
Cadmium	**0.24**	mg/kg	0.15	0.033	1	11/09/21 13:35	11/15/21 12:53	7440-43-9	
Copper	**39.9**	mg/kg	0.49	0.071	1	11/09/21 13:35	11/15/21 12:53	7440-50-8	
Lead	**37.2**	mg/kg	0.97	0.20	2	11/09/21 13:35	11/15/21 13:32	7439-92-1	
Zinc	**102**	mg/kg	1.9	0.22	1	11/09/21 13:35	11/15/21 12:53	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.065**	mg/kg	0.018	0.0078	1	11/10/21 08:31	11/16/21 14:21	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**4.1**	%	0.10	0.10	1		11/08/21 09:03		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Sample: BPSOU-UR01SS18-110221-1 **Lab ID: 10586277004** Collected: 11/02/21 13:15 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**7.2**	mg/kg	2.1	0.32	2	11/09/21 13:35	11/15/21 13:33	7440-38-2	
Cadmium	**0.66**	mg/kg	0.31	0.071	2	11/09/21 13:35	11/15/21 13:33	7440-43-9	
Copper	**54.7**	mg/kg	1.0	0.15	2	11/09/21 13:35	11/15/21 13:33	7440-50-8	
Lead	**80.7**	mg/kg	1.0	0.21	2	11/09/21 13:35	11/15/21 13:33	7439-92-1	
Zinc	**200**	mg/kg	4.2	0.46	2	11/09/21 13:35	11/15/21 13:33	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.12**	mg/kg	0.021	0.0090	1	11/10/21 08:31	11/16/21 14:23	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**6.5**	%	0.10	0.10	1		11/08/21 09:03		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Sample: BPSOU-UR01SS18-110221-2 **Lab ID: 10586277005** Collected: 11/02/21 13:10 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**5.1**	mg/kg	1.0	0.16	1	11/09/21 13:35	11/15/21 12:56	7440-38-2	
Cadmium	**0.21**	mg/kg	0.15	0.035	1	11/09/21 13:35	11/15/21 12:56	7440-43-9	
Copper	**39.4**	mg/kg	0.51	0.075	1	11/09/21 13:35	11/15/21 12:56	7440-50-8	
Lead	**26.5**	mg/kg	1.0	0.21	2	11/09/21 13:35	11/15/21 13:35	7439-92-1	
Zinc	**79.4**	mg/kg	2.0	0.23	1	11/09/21 13:35	11/15/21 12:56	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.11**	mg/kg	0.017	0.0076	1	11/10/21 08:31	11/16/21 14:25	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**4.3**	%	0.10	0.10	1		11/08/21 09:03		N2

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Sample: BPSOU-UR01SS18-110221-3 **Lab ID: 10586277006** Collected: 11/02/21 13:05 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**5.0**	mg/kg	1.0	0.15	1	11/09/21 13:35	11/15/21 12:58	7440-38-2	
Cadmium	**0.24**	mg/kg	0.15	0.034	1	11/09/21 13:35	11/15/21 12:58	7440-43-9	
Copper	**39.4**	mg/kg	0.51	0.074	1	11/09/21 13:35	11/15/21 12:58	7440-50-8	
Lead	**23.8**	mg/kg	1.0	0.21	2	11/09/21 13:35	11/15/21 13:37	7439-92-1	
Zinc	**76.3**	mg/kg	2.0	0.23	1	11/09/21 13:35	11/15/21 12:58	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.082**	mg/kg	0.018	0.0080	1	11/10/21 08:31	11/16/21 14:30	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**4.0**	%	0.10	0.10	1		11/08/21 09:04		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Sample: BPSOU-UR01SS16-110221-2 **Lab ID: 10586277007** Collected: 11/02/21 13:40 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**11.8**	mg/kg	2.0	0.31	2	11/09/21 13:35	11/15/21 13:38	7440-38-2	
Cadmium	**0.55**	mg/kg	0.30	0.069	2	11/09/21 13:35	11/15/21 13:38	7440-43-9	
Copper	**46.7**	mg/kg	1.0	0.15	2	11/09/21 13:35	11/15/21 13:38	7440-50-8	
Lead	**43.5**	mg/kg	1.0	0.21	2	11/09/21 13:35	11/15/21 13:38	7439-92-1	
Zinc	**134**	mg/kg	4.1	0.45	2	11/09/21 13:35	11/15/21 13:38	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.11**	mg/kg	0.018	0.0080	1	11/10/21 08:31	11/16/21 14:31	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**4.2**	%	0.10	0.10	1		11/08/21 09:04		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Sample: BPSOU-UR01SS16-110221-3 **Lab ID: 10586277008** Collected: 11/02/21 13:35 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**6.0**	mg/kg	1.9	0.30	2	11/09/21 13:35	11/15/21 13:40	7440-38-2	
Cadmium	**0.46**	mg/kg	0.29	0.066	2	11/09/21 13:35	11/15/21 13:40	7440-43-9	
Copper	**58.9**	mg/kg	0.97	0.14	2	11/09/21 13:35	11/15/21 13:40	7440-50-8	
Lead	**55.4**	mg/kg	0.97	0.20	2	11/09/21 13:35	11/15/21 13:40	7439-92-1	
Zinc	**138**	mg/kg	3.9	0.43	2	11/09/21 13:35	11/15/21 13:40	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.21**	mg/kg	0.019	0.0084	1	11/10/21 08:31	11/16/21 14:33	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**3.5**	%	0.10	0.10	1		11/08/21 09:04		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Sample: BPSOU-UR01SS15-110221-1 **Lab ID: 10586277009** Collected: 11/02/21 13:15 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**8.1**	mg/kg	2.0	0.31	2	11/09/21 13:35	11/15/21 13:42	7440-38-2	
Cadmium	**0.53**	mg/kg	0.31	0.070	2	11/09/21 13:35	11/15/21 13:42	7440-43-9	
Copper	**73.2**	mg/kg	1.0	0.15	2	11/09/21 13:35	11/15/21 13:42	7440-50-8	
Lead	**75.5**	mg/kg	1.0	0.21	2	11/09/21 13:35	11/15/21 13:42	7439-92-1	
Zinc	**168**	mg/kg	4.1	0.46	2	11/09/21 13:35	11/15/21 13:42	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.61**	mg/kg	0.019	0.0082	1	11/10/21 08:31	11/16/21 14:34	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**6.2**	%	0.10	0.10	1		11/08/21 09:04		N2

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Sample: BPSOU-UR01SS15-110221-2 **Lab ID: 10586277010** Collected: 11/02/21 13:10 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**12.2**	mg/kg	2.0	0.31	2	11/09/21 13:35	11/15/21 13:43	7440-38-2	
Cadmium	**1.7**	mg/kg	0.31	0.070	2	11/09/21 13:35	11/15/21 13:43	7440-43-9	
Copper	**71.4**	mg/kg	1.0	0.15	2	11/09/21 13:35	11/15/21 13:43	7440-50-8	
Lead	**200**	mg/kg	1.0	0.21	2	11/09/21 13:35	11/15/21 13:43	7439-92-1	
Zinc	**315**	mg/kg	4.1	0.46	2	11/09/21 13:35	11/15/21 13:43	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.23**	mg/kg	0.021	0.0091	1	11/10/21 08:31	11/16/21 14:36	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**5.0**	%	0.10	0.10	1		11/08/21 09:04		N2

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Sample: BPSOU-UR01SS15-110221-3 **Lab ID: 10586277011** Collected: 11/02/21 13:05 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**8.1**	mg/kg	2.0	0.31	2	11/09/21 13:35	11/15/21 13:48	7440-38-2	
Cadmium	**0.90**	mg/kg	0.30	0.069	2	11/09/21 13:35	11/15/21 13:48	7440-43-9	
Copper	**82.0**	mg/kg	1.0	0.15	2	11/09/21 13:35	11/15/21 13:48	7440-50-8	
Lead	**195**	mg/kg	1.0	0.21	2	11/09/21 13:35	11/15/21 13:48	7439-92-1	
Zinc	**243**	mg/kg	4.1	0.45	2	11/09/21 13:35	11/15/21 13:48	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.15**	mg/kg	0.020	0.0085	1	11/10/21 08:31	11/16/21 14:38	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**4.2**	%	0.10	0.10	1		11/08/21 09:04		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Sample: BPSOU-UR01SS01-110321-2 **Lab ID: 10586277012** Collected: 11/03/21 10:20 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**4.7**	mg/kg	1.0	0.16	1	11/09/21 13:35	11/15/21 13:11	7440-38-2	
Cadmium	**0.19**	mg/kg	0.16	0.036	1	11/09/21 13:35	11/15/21 13:11	7440-43-9	
Copper	**40.1**	mg/kg	0.52	0.076	1	11/09/21 13:35	11/15/21 13:11	7440-50-8	
Lead	**22.7**	mg/kg	1.0	0.21	2	11/09/21 13:35	11/15/21 13:50	7439-92-1	
Zinc	**70.3**	mg/kg	2.1	0.23	1	11/09/21 13:35	11/15/21 13:11	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**<0.0081**	mg/kg	0.019	0.0081	1	11/10/21 08:31	11/16/21 14:39	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**5.0**	%	0.10	0.10	1		11/08/21 09:05		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Sample: BPSOU-UR01SS01-110321-3 **Lab ID: 10586277013** Collected: 11/03/21 10:15 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**3.4**	mg/kg	1.0	0.16	1	11/09/21 13:35	11/15/21 13:13	7440-38-2	
Cadmium	**0.16**	mg/kg	0.15	0.035	1	11/09/21 13:35	11/15/21 13:13	7440-43-9	
Copper	**42.1**	mg/kg	0.51	0.075	1	11/09/21 13:35	11/15/21 13:13	7440-50-8	
Lead	**24.7**	mg/kg	1.0	0.21	2	11/09/21 13:35	11/15/21 13:52	7439-92-1	
Zinc	**75.5**	mg/kg	2.1	0.23	1	11/09/21 13:35	11/15/21 13:13	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.0098J**	mg/kg	0.018	0.0077	1	11/16/21 12:57	11/16/21 16:51	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**3.7**	%	0.10	0.10	1		11/08/21 09:05		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Sample: BPSOU-UR01SS01-110321-3-FD **Lab ID: 10586277014** Collected: 11/03/21 10:10 Received: 11/04/21 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**3.1**	mg/kg	0.97	0.15	1	11/09/21 13:35	11/15/21 13:17	7440-38-2	
Cadmium	**0.18**	mg/kg	0.15	0.033	1	11/09/21 13:35	11/15/21 13:17	7440-43-9	
Copper	**45.4**	mg/kg	0.48	0.071	1	11/09/21 13:35	11/15/21 13:17	7440-50-8	
Lead	**20.2**	mg/kg	0.97	0.20	2	11/09/21 13:35	11/15/21 13:53	7439-92-1	
Zinc	**76.9**	mg/kg	1.9	0.22	1	11/09/21 13:35	11/15/21 13:17	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.018J**	mg/kg	0.021	0.0090	1	11/10/21 08:31	11/16/21 14:41	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**3.6**	%	0.10	0.10	1		11/08/21 09:05		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

QC Batch: 782131 — Analysis Method: EPA 7471B
QC Batch Method: EPA 7471B — Analysis Description: 7471B Mercury Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10586277001, 10586277002, 10586277003, 10586277004, 10586277005, 10586277006, 10586277007, 10586277008, 10586277009, 10586277010, 10586277011, 10586277012, 10586277014

METHOD BLANK: 4164990 — Matrix: Solid
Associated Lab Samples: 10586277001, 10586277002, 10586277003, 10586277004, 10586277005, 10586277006, 10586277007, 10586277008, 10586277009, 10586277010, 10586277011, 10586277012, 10586277014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	<0.0074	0.017	0.0074	11/16/21 14:12	

LABORATORY CONTROL SAMPLE: 4164991

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.48	0.47	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4164992 4164993

Parameter	Units	10586277001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.051	0.51	0.45	0.50	0.27	87	49	80-120	58	20	M1,R1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

QC Batch: 784057
QC Batch Method: EPA 7471B
Analysis Method: EPA 7471B
Analysis Description: 7471B Mercury Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10586277013

METHOD BLANK: 4174020 Matrix: Solid
Associated Lab Samples: 10586277013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	<0.0079	0.018	0.0079	11/16/21 16:47	

LABORATORY CONTROL SAMPLE: 4174021

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.45	0.42	93	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4174022 4174023

Parameter	Units	10586277013 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.0098J	0.47	0.49	0.46	0.47	96	94	80-120	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

QC Batch: 782084
QC Batch Method: EPA 3050B
Analysis Method: EPA 6010D
Analysis Description: 6010D Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10586277001, 10586277002, 10586277003, 10586277004, 10586277005, 10586277006, 10586277007, 10586277008, 10586277009, 10586277010, 10586277011, 10586277012, 10586277013, 10586277014

METHOD BLANK: 4164873 Matrix: Solid
Associated Lab Samples: 10586277001, 10586277002, 10586277003, 10586277004, 10586277005, 10586277006, 10586277007, 10586277008, 10586277009, 10586277010, 10586277011, 10586277012, 10586277013, 10586277014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/kg	<0.14	0.93	0.14	11/15/21 12:36	
Cadmium	mg/kg	<0.032	0.14	0.032	11/15/21 12:36	
Copper	mg/kg	<0.068	0.47	0.068	11/15/21 12:36	
Lead	mg/kg	<0.096	0.47	0.096	11/15/21 12:36	
Zinc	mg/kg	<0.21	1.9	0.21	11/15/21 12:36	

LABORATORY CONTROL SAMPLE: 4164874

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	49	46.7	95	80-120	
Cadmium	mg/kg	49	48.0	98	80-120	
Copper	mg/kg	49	47.6	97	80-120	
Lead	mg/kg	49	47.3	97	80-120	
Zinc	mg/kg	49	47.0	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4164875 4164876

Parameter	Units	10586277001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	5.0	49.8	50.2	48.7	47.4	88	84	75-125	3	20	
Cadmium	mg/kg	0.33	49.8	50.2	44.8	43.7	89	86	75-125	3	20	
Copper	mg/kg	49.9	49.8	50.2	100	95.3	101	90	75-125	5	20	
Lead	mg/kg	39.4	49.8	50.2	76.1	72.6	74	66	75-125	5	20	M1
Zinc	mg/kg	114	49.8	50.2	144	141	60	55	75-125	2	20	M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

QC Batch: 782118
QC Batch Method: ASTM D2974
Analysis Method: ASTM D2974
Analysis Description: Dry Weight / %M by ASTM D2974
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10586277001, 10586277002, 10586277003, 10586277004, 10586277005, 10586277006, 10586277007, 10586277008, 10586277009, 10586277010, 10586277011, 10586277012, 10586277013, 10586277014

SAMPLE DUPLICATE: 4164950

Parameter	Units	10586277001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	5.2	5.9	12	30	N2

SAMPLE DUPLICATE: 4164951

Parameter	Units	10586277011 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	4.2	4.2	0	30	N2

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
N2	The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.
R1	RPD value was outside control limits.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586277

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10586277001	BPSOU-UR01SS19-110221-1	EPA 3050B	782084	EPA 6010D	782952
10586277002	BPSOU-UR01SS19-110221-2	EPA 3050B	782084	EPA 6010D	782952
10586277003	BPSOU-UR01SS19-110221-3	EPA 3050B	782084	EPA 6010D	782952
10586277004	BPSOU-UR01SS18-110221-1	EPA 3050B	782084	EPA 6010D	782952
10586277005	BPSOU-UR01SS18-110221-2	EPA 3050B	782084	EPA 6010D	782952
10586277006	BPSOU-UR01SS18-110221-3	EPA 3050B	782084	EPA 6010D	782952
10586277007	BPSOU-UR01SS16-110221-2	EPA 3050B	782084	EPA 6010D	782952
10586277008	BPSOU-UR01SS16-110221-3	EPA 3050B	782084	EPA 6010D	782952
10586277009	BPSOU-UR01SS15-110221-1	EPA 3050B	782084	EPA 6010D	782952
10586277010	BPSOU-UR01SS15-110221-2	EPA 3050B	782084	EPA 6010D	782952
10586277011	BPSOU-UR01SS15-110221-3	EPA 3050B	782084	EPA 6010D	782952
10586277012	BPSOU-UR01SS01-110321-2	EPA 3050B	782084	EPA 6010D	782952
10586277013	BPSOU-UR01SS01-110321-3	EPA 3050B	782084	EPA 6010D	782952
10586277014	BPSOU-UR01SS01-110321-3-FD	EPA 3050B	782084	EPA 6010D	782952
10586277001	BPSOU-UR01SS19-110221-1	EPA 7471B	782131	EPA 7471B	783167
10586277002	BPSOU-UR01SS19-110221-2	EPA 7471B	782131	EPA 7471B	783167
10586277003	BPSOU-UR01SS19-110221-3	EPA 7471B	782131	EPA 7471B	783167
10586277004	BPSOU-UR01SS18-110221-1	EPA 7471B	782131	EPA 7471B	783167
10586277005	BPSOU-UR01SS18-110221-2	EPA 7471B	782131	EPA 7471B	783167
10586277006	BPSOU-UR01SS18-110221-3	EPA 7471B	782131	EPA 7471B	783167
10586277007	BPSOU-UR01SS16-110221-2	EPA 7471B	782131	EPA 7471B	783167
10586277008	BPSOU-UR01SS16-110221-3	EPA 7471B	782131	EPA 7471B	783167
10586277009	BPSOU-UR01SS15-110221-1	EPA 7471B	782131	EPA 7471B	783167
10586277010	BPSOU-UR01SS15-110221-2	EPA 7471B	782131	EPA 7471B	783167
10586277011	BPSOU-UR01SS15-110221-3	EPA 7471B	782131	EPA 7471B	783167
10586277012	BPSOU-UR01SS01-110321-2	EPA 7471B	782131	EPA 7471B	783167
10586277013	BPSOU-UR01SS01-110321-3	EPA 7471B	784057	EPA 7471B	784116
10586277014	BPSOU-UR01SS01-110321-3-FD	EPA 7471B	782131	EPA 7471B	783167
10586277001	BPSOU-UR01SS19-110221-1	ASTM D2974	782118		
10586277002	BPSOU-UR01SS19-110221-2	ASTM D2974	782118		
10586277003	BPSOU-UR01SS19-110221-3	ASTM D2974	782118		
10586277004	BPSOU-UR01SS18-110221-1	ASTM D2974	782118		
10586277005	BPSOU-UR01SS18-110221-2	ASTM D2974	782118		
10586277006	BPSOU-UR01SS18-110221-3	ASTM D2974	782118		
10586277007	BPSOU-UR01SS16-110221-2	ASTM D2974	782118		
10586277008	BPSOU-UR01SS16-110221-3	ASTM D2974	782118		
10586277009	BPSOU-UR01SS15-110221-1	ASTM D2974	782118		
10586277010	BPSOU-UR01SS15-110221-2	ASTM D2974	782118		
10586277011	BPSOU-UR01SS15-110221-3	ASTM D2974	782118		
10586277012	BPSOU-UR01SS01-110321-2	ASTM D2974	782118		
10586277013	BPSOU-UR01SS01-110321-3	ASTM D2974	782118		
10586277014	BPSOU-UR01SS01-110321-3-FD	ASTM D2974	782118		

Laboratory Management Program (LaMP) Chain of Custody Record

Soil, Sediment and Groundwater Samples

BP Site Node Path: _____ Req Due Date (mm/dd/yy): 11/17/21 Rush TAT Yes 14 day No _____

BP/RM Facility No: _____ Lab Work Order Number: _____

Lab Name: Pace Analytical	BP/ARC Facility Address:	Consultant/Contractor:	Pioneer Technical Services
Lab Address: 1700 Elm Street SE, Minneapolis, MN 55414	City, State, ZIP Code:	Consultant/Contractor Project No:	BPSOU Unreclaimed Sampling
Lab PM: Jennifer Anderson	Lead Regulatory Agency:	Address:	1101 S. Montana St.
Lab Phone: 612-607-6436	California Global ID No.:	Consultant/Contractor PM:	Scott Sampson
Lab Shipping Accnt:	Enfos Proposal No:	Phone: 406-697-0946 Email:	ssampson@pioneer-technical.com
Lab Bottle Order No:	Accounting Mode: Provision ____ OOC-BU ____ OOC-RM ____	Send/Submit EDD to:	Scott Sampson
Other Info:	Stage Activity	Invoice To:	BP-RM _____ BP-Other _____

BP/RM PM: Mike Mc Anulty

PM Phone: 406-723-1822

PM Email: mcanumc@bp.com

Requested Analyses

Report Type & QC Level

Limited (Standard) Package ___

Limited Plus Package ___

Full Package Level 2

WO# : 10586277

10586277

Lab No.	Unique Sample ID, must follow format of SAMPLENAMEYYYYMMDD Examples: MW01_20190101; BH01_3-5_20190101	Time	Depth Unit	Grab (G) or Composite (C)	Total Number of Containers	Matrix	Analysis	Total Metals 6010 As, Cd, Cu, Pb, Zn	7471 Mercury	Filtered (Y/N)	Preservation	Report Type & QC Level
	BPSOU-UR01SS19-110221-1	13:30	in	c	1	soil		x	x			001
	BPSOU-UR01SS19-110221-2	13:25	in	c	1	soil		x	x			002
	BPSOU-UR01SS19-110221-3	13:20	in	c	1	soil		x	x			003
	BPSOU-UR01SS18-110221-1	13:15	in	c	1	soil		x	x			004
	BPSOU-UR01SS18-110221-2	13:10	in	c	1	soil		x	x			005
	BPSOU-UR01SS18-110221-3	13:05	in	c	1	soil		x	x			006
	BPSOU-UR01SS16-110221-2	13:40	in	c	1	soil		x	x			007

		Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Name:	Jesse Sims	Jesse Sims/PTS	11/3/2021	1600	ACIPACK	11/04/21	1030
Sampler's Company:	Pioneer Technical Services						
Ship Method:	FedEx Overnight 11/3/2021						
Shipment Tracking No:	4278 9934 6440						

Special Instructions: *Maximum 14 day TAT

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: 4 °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

BP LaMP Soil/H2O COC March 2019

Laboratory Management Program (LaMP) Chain of Custody Record

Soil, Sediment and Groundwater Samples

BP Site Node Path: _____ Req Due Date (mm/dd/yy): 11/17/21 Rush TAT Yes 14 day No _____

BP/RM Facility No: _____ Lab Work Order Number: _____

Lab Name: Pace Analytical	BP/ARC Facility Address:	Consultant/Contractor:	Pioneer Technical Services
Lab Address: 1700 Elm Street SE, Minneapolis, MN 55414	City, State, ZIP Code:	Consultant/Contractor Project No:	BPSOU Unreclaimed Sampling
Lab PM: Jennifer Anderson	Lead Regulatory Agency:	Address:	1101 S. Montana St.
Lab Phone: 612-607-6436	California Global ID No.:	Consultant/Contractor PM:	Scott Sampson
Lab Shipping Accnt:	Enfos Proposal No:	Phone: 406-697-0946 Email:	ssampson@pioneer-technical.com
Lab Bottle Order No:	Accounting Mode: Provision ____ OOC-BU ____ OOC-RM ____	Send/Submit EDD to:	Scott Sampson
Other Info:	Stage Activity	Invoice To:	BP-RM ____ BP-Other ____

BP/RM PM: Mike Mc Anulty

PM Phone: 406-723-1822

PM Email: mcanumc@bp.com

Requested Analyses

Report Type & QC Level

Limited (Standard) Package ___

Limited Plus Package ___

Full Package Level 2

Lab No.	Unique Sample ID, must follow format of SAMPLENAMEYYYYMMDD Examples: MW01_20190101; BH01_3-5_20190101	Time	Depth Unit	Grab (G) or Composite (C)	Total Number of Containers	Matrix	Analysis	Total Metals 6010 As, Cd, Cu, Pb, Zn	7471 Mercury	Comments
	BPSOU-UR01SS16-110221-3	13:35	in	c	1	soil		x	x	008
	BPSOU-UR01SS15-110221-1	13:15	in	c	1	soil		x	x	009
	BPSOU-UR01SS15-110221-2	13:10	in	c	1	soil		x	x	010
	BPSOU-UR01SS15-110221-3	13:05	in	c	1	soil		x	x	011
	BPSOU-UR01SS01-110321-2	10:20	in	c	1	soil		x	x	012
	BPSOU-UR01SS01-110321-3	10:15	in	c	1	soil		x	x	013
	BPSOU-UR01SS01-110321-3-FD	10:10	in	c	1	soil		x	x	014

		Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Name:	Jesse Sims	Jesse Sims/PTS	11/3/2021	1600	ACIPAGS	11/04/21	10:00
Sampler's Company:	Pioneer Technical Services						
Ship Method:	FedEx Overnight 11/3/2021						
Shipment Tracking No:	4278 9934 6440						

Special Instructions: *Maximum 14 day TAT

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: 1.4 °F/C | Trip Blank: Yes (No) | MS/MSD Sample Submitted: Yes / No

BP LaMP Soil/H2O COC March 2019

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - ESI**	Document Revised: 12Aug2020 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0149 Rev.01**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt – ESI Tech Specs

Client Name: GEOMATRIX TECHNICAL SERVICES

Project #: WO#: 10586277

PM: JMA Due Date: 11/17/21

CLIENT: BP-PIONEER

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Pace ☐ SpeeDee ☐ Commercial

Tracking Number: 427899346440 **See Exceptions** ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☒ Yes ☐ No **Seals Intact?** ☒ Yes ☐ No **Biological Tissue Frozen?** ☐ Yes ☐ No ☒ N/A

Packing Material: ☒ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other:_____ **Temp Blank?** ☒ Yes ☐ No

Thermometer: ☐ T1(0461) ☐ T2(1336) ☐ T3(0459) ☒ T4(0254) ☐ T5(0489) **Type of Ice:** ☐ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 1.4 °C

Correction Factor: NA **Cooler Temp Corrected w/temp blank :** 1.4 °C

Average Corrected Temp (no temp blank only): _____ °C ☐ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container

USDA Regulated Soil: (☐ N/A, water sample/Other:_____)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☒ No

Date/Initials of Person Examining Contents: AC 11/8/21

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☒ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☒ Yes	☐ No		1.
Chain of Custody Relinquished?	☒ Yes	☐ No		2.
Sampler Name and/or Signature on COC?	☒ Yes	☐ No	☐ N/A	3.
Samples Arrived within Hold Time?	☒ Yes	☐ No		4.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☒ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E coli ☐ BOD/cBOD ☐ Hex Chrome ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐
Rush Turn Around Time Requested?	☐ Yes	☒ No		6.
Sufficient Sample Volume?	☒ Yes	☐ No		7.
Triple Volume Provided for MS/MSD (if more than 10 samples)?	☐ Yes	☒ No	☒ N/A	
Correct Containers Used?	☒ Yes	☐ No		8.
-Pace Containers Used?	☐ Yes	☒ No		
Containers Intact?	☒ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☒ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC	☒ Yes	☐ No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ ENV-FRM-MIN4-0142
Matrix: ☐ Water ☒ Soil ☐ Oil ☐ Other_____				
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☒ N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐ Yes	☐ No	☒ N/A	☐ NaOH ☐ HNO_3 ☐ H_2SO_4 ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS *If adding preservative to a container it must be added to associated field and equipment blanks (verify with PM first)	☐ Yes	☐ No	☒ N/A	Positive for Res. Chlorine? ☐ Yes ☐ No **pH Paper Lot#** **See Exception** ☐ ENV-FRM-MIN4-0142
				Res. Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO contaners?	☐ Yes	☐ No	☒ N/A	13. **See Exception** ☐ ENV-FRM-MIN4-0140
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☐ No	☒ N/A	
3 Trip Blanks Present?	☐ Yes	☐ No	☒ N/A	14.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☒ N/A	Pace Trip Blank Lot # (if purchased):_____

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins			
Opened Time: 1235	Temp: 1.4	Corrected Temp: 1.4	
Time:	put in cooler		
Time: 1235	Temp: 1.4	Corrected Temp: 1.4	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: BHW 11/8/21 **Date:** 11/07/2021

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Labeled by: AC (1)

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

November 17, 2021

Scott Sampson
Pioneer Technical Services
1101 S. Montana Street
Butte, MT 59701

RE: Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

Dear Scott Sampson:

Enclosed are the analytical results for sample(s) received by the laboratory on November 04, 2021. The results relate only to the samples included in this report. Results contained within this report conform to the most current version of the TNI standards, BP LaMP Technical Requirements Revision 12.1, and any applicable Quality Assurance Project Plan (QAPP), or Work Plan unless otherwise narrated in the body of this report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

Pace Analytical Services, LLC - Minneapolis MN

1700 Elm Street SE, Minneapolis, MN 55414
A2LA Certification #: 2926.01*
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009*
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014*
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8 Tribal Water Systems+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605*
Georgia Certification #: 959
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086*
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064*
Maryland Certification #: 322
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137*
Minnesota Dept of Ag Approval: via MN 027-053-137
Minnesota Petrofund Registration #: 1240*
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081*
New Jersey Certification #: MN002
New York Certification #: 11647*
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification (1700) #: CL101
Ohio VAP Certification (1800) #: CL110*
Oklahoma Certification #: 9507*
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001*
Pennsylvania Certification #: 68-00563*
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192*
Utah Certification #: MN00064*
Vermont Certification #: VT-027053137
Virginia Certification #: 460163*
Washington Certification #: C486*
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208
*Please Note: Applicable air certifications are denoted with an asterisk (*).

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10586396001	**BPSOU-UR01SS13-110221-1**	Solid	11/02/21 15:00	11/04/21 08:50
10586396002	**BPSOU-UR01SS13-110221-2**	Solid	11/02/21 14:55	11/04/21 08:50
10586396003	**BPSOU-UR01SS13-110221-3**	Solid	11/02/21 14:50	11/04/21 08:50
10586396004	**BPSOU-UR01SS12-110221-2**	Solid	11/02/21 15:20	11/04/21 08:50
10586396005	**BPSOU-UR01SS11-110221-2**	Solid	11/02/21 15:20	11/04/21 08:50
10586396006	**BPSOU-UR01SS11-110221-3**	Solid	11/02/21 15:15	11/04/21 08:50
10586396007	**BPSOU-UR01SS10-110221-2**	Solid	11/02/21 15:00	11/04/21 08:50
10586396008	**BPSOU-UR01SS10-110221-3**	Solid	11/02/21 14:55	11/04/21 08:50
10586396009	**BPSOU-UR01SS08-110221-1**	Solid	11/02/21 14:35	11/04/21 08:50
10586396010	**BPSOU-UR01SS08-110221-2**	Solid	11/02/21 14:30	11/04/21 08:50
10586396011	**BPSOU-UR01SS08-110221-3**	Solid	11/02/21 14:25	11/04/21 08:50
10586396012	**BPSOU-UR01SS02-110321-2**	Solid	11/03/21 10:25	11/04/21 08:50
10586396013	**BPSOU-UR01SS02-110321-2-FD**	Solid	11/03/21 10:20	11/04/21 08:50

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10586396001	BPSOU-UR01SS13-110221-1	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586396002	BPSOU-UR01SS13-110221-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586396003	BPSOU-UR01SS13-110221-3	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586396004	BPSOU-UR01SS12-110221-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586396005	BPSOU-UR01SS11-110221-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586396006	BPSOU-UR01SS11-110221-3	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586396007	BPSOU-UR01SS10-110221-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586396008	BPSOU-UR01SS10-110221-3	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586396009	BPSOU-UR01SS08-110221-1	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586396010	BPSOU-UR01SS08-110221-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586396011	BPSOU-UR01SS08-110221-3	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586396012	BPSOU-UR01SS02-110321-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1
10586396013	BPSOU-UR01SS02-110321-2-FD	EPA 6010D	DM	5

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		EPA 7471B	LMW	1
		ASTM D2974	JL5	1

PASI-M = Pace Analytical Services - Minneapolis

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

Method: **EPA 6010D**
Description: 6010D MET ICP
Client: BPAR-PIONEER-MT
Date: November 17, 2021

General Information:
13 samples were analyzed for EPA 6010D by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

Method: **EPA 7471B**
Description: 7471B Mercury
Client: BPAR-PIONEER-MT
Date: November 17, 2021

General Information:
13 samples were analyzed for EPA 7471B by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 782132

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10586396001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MSD (Lab ID: 4164997)
  - Mercury

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

Sample: BPSOU-UR01SS13-110221-1 **Lab ID: 10586396001** Collected: 11/02/21 15:00 Received: 11/04/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**9.4**	mg/kg	2.0	0.31	2	11/09/21 10:03	11/15/21 14:00	7440-38-2	
Cadmium	**0.30**	mg/kg	0.30	0.069	2	11/09/21 10:03	11/15/21 14:00	7440-43-9	
Copper	**59.2**	mg/kg	1.0	0.15	2	11/09/21 10:03	11/15/21 14:00	7440-50-8	
Lead	**25.5**	mg/kg	1.0	0.21	2	11/09/21 10:03	11/15/21 14:00	7439-92-1	
Zinc	**113**	mg/kg	4.0	0.45	2	11/09/21 10:03	11/15/21 14:00	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.032**	mg/kg	0.022	0.0094	1	11/09/21 10:19	11/16/21 13:39	7439-97-6	M1
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**7.4**	%	0.10	0.10	1		11/08/21 11:40		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

Sample: BPSOU-UR01SS13-110221-2 **Lab ID: 10586396002** Collected: 11/02/21 14:55 Received: 11/04/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**4.9**	mg/kg	1.0	0.16	1	11/09/21 10:03	11/15/21 14:35	7440-38-2	
Cadmium	**0.14J**	mg/kg	0.16	0.035	1	11/09/21 10:03	11/15/21 14:35	7440-43-9	
Copper	**48.8**	mg/kg	0.52	0.076	1	11/09/21 10:03	11/15/21 14:35	7440-50-8	
Lead	**12.1**	mg/kg	1.0	0.21	2	11/09/21 10:03	11/15/21 14:12	7439-92-1	
Zinc	**78.3**	mg/kg	2.1	0.23	1	11/09/21 10:03	11/15/21 14:35	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.010J**	mg/kg	0.020	0.0087	1	11/09/21 10:19	11/16/21 13:44	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**6.2**	%	0.10	0.10	1		11/08/21 11:40		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

Sample: BPSOU-UR01SS13-110221-3 **Lab ID: 10586396003** Collected: 11/02/21 14:50 Received: 11/04/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**2.7**	mg/kg	1.0	0.16	1	11/09/21 10:03	11/15/21 14:38	7440-38-2	
Cadmium	**0.24**	mg/kg	0.15	0.035	1	11/09/21 10:03	11/15/21 14:38	7440-43-9	
Copper	**45.9**	mg/kg	0.51	0.074	1	11/09/21 10:03	11/15/21 14:38	7440-50-8	
Lead	**7.8**	mg/kg	1.0	0.21	2	11/09/21 10:03	11/15/21 14:13	7439-92-1	
Zinc	**79.3**	mg/kg	2.0	0.23	1	11/09/21 10:03	11/15/21 14:38	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.012J**	mg/kg	0.018	0.0079	1	11/09/21 10:19	11/16/21 13:46	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**6.3**	%	0.10	0.10	1		11/08/21 11:40		N2

REPORT OF LABORATORY ANALYSIS

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1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

Sample: BPSOU-UR01SS12-110221-2 **Lab ID: 10586396004** Collected: 11/02/21 15:20 Received: 11/04/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**18.0**	mg/kg	1.2	0.18	1	11/09/21 10:03	11/15/21 14:40	7440-38-2	
Cadmium	**0.30**	mg/kg	0.17	0.039	1	11/09/21 10:03	11/15/21 14:40	7440-43-9	
Copper	**35.0**	mg/kg	0.58	0.084	1	11/09/21 10:03	11/15/21 14:40	7440-50-8	
Lead	**20.6**	mg/kg	0.58	0.12	1	11/09/21 10:03	11/15/21 14:40	7439-92-1	
Zinc	**144**	mg/kg	2.3	0.26	1	11/09/21 10:03	11/15/21 14:40	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.014J**	mg/kg	0.025	0.011	1	11/09/21 10:19	11/16/21 13:47	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**19.8**	%	0.10	0.10	1		11/08/21 11:41		N2

REPORT OF LABORATORY ANALYSIS

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1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

Sample: BPSOU-UR01SS11-110221-2 **Lab ID: 10586396005** Collected: 11/02/21 15:20 Received: 11/04/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**4.7**	mg/kg	1.0	0.15	1	11/09/21 10:03	11/15/21 14:42	7440-38-2	
Cadmium	**0.26**	mg/kg	0.15	0.034	1	11/09/21 10:03	11/15/21 14:42	7440-43-9	
Copper	**44.6**	mg/kg	0.50	0.073	1	11/09/21 10:03	11/15/21 14:42	7440-50-8	
Lead	**26.7**	mg/kg	1.0	0.21	2	11/09/21 10:03	11/15/21 14:17	7439-92-1	
Zinc	**83.1**	mg/kg	2.0	0.22	1	11/09/21 10:03	11/15/21 14:42	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.020**	mg/kg	0.018	0.0079	1	11/09/21 10:19	11/16/21 13:49	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**3.5**	%	0.10	0.10	1		11/08/21 11:41		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

Sample: BPSOU-UR01SS11-110221-3 **Lab ID: 10586396006** Collected: 11/02/21 15:15 Received: 11/04/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**7.3**	mg/kg	2.0	0.30	2	11/09/21 10:03	11/15/21 14:18	7440-38-2	
Cadmium	**0.58**	mg/kg	0.30	0.068	2	11/09/21 10:03	11/15/21 14:18	7440-43-9	
Copper	**61.8**	mg/kg	0.99	0.15	2	11/09/21 10:03	11/15/21 14:18	7440-50-8	
Lead	**88.7**	mg/kg	0.99	0.20	2	11/09/21 10:03	11/15/21 14:18	7439-92-1	
Zinc	**167**	mg/kg	4.0	0.44	2	11/09/21 10:03	11/15/21 14:18	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.097**	mg/kg	0.017	0.0075	1	11/09/21 10:19	11/16/21 13:54	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**3.3**	%	0.10	0.10	1		11/08/21 11:41		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

Sample: BPSOU-UR01SS10-110221-2 **Lab ID: 10586396007** Collected: 11/02/21 15:00 Received: 11/04/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**4.9**	mg/kg	2.0	0.31	2	11/09/21 10:03	11/15/21 14:20	7440-38-2	
Cadmium	**0.33**	mg/kg	0.30	0.068	2	11/09/21 10:03	11/15/21 14:20	7440-43-9	
Copper	**47.4**	mg/kg	1.0	0.15	2	11/09/21 10:03	11/15/21 14:20	7440-50-8	
Lead	**15.0**	mg/kg	1.0	0.21	2	11/09/21 10:03	11/15/21 14:20	7439-92-1	
Zinc	**78.5**	mg/kg	4.0	0.45	2	11/09/21 10:03	11/15/21 14:20	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.23**	mg/kg	0.017	0.0075	1	11/09/21 10:19	11/16/21 13:55	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**3.8**	%	0.10	0.10	1		11/08/21 11:41		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

Sample: BPSOU-UR01SS10-110221-3 **Lab ID: 10586396008** Collected: 11/02/21 14:55 Received: 11/04/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**4.3**	mg/kg	2.4	0.36	2	11/09/21 10:03	11/15/21 14:22	7440-38-2	
Cadmium	**0.43**	mg/kg	0.35	0.080	2	11/09/21 10:03	11/15/21 14:22	7440-43-9	
Copper	**64.8**	mg/kg	1.2	0.17	2	11/09/21 10:03	11/15/21 14:22	7440-50-8	
Lead	**17.7**	mg/kg	1.2	0.24	2	11/09/21 10:03	11/15/21 14:22	7439-92-1	
Zinc	**110**	mg/kg	4.7	0.53	2	11/09/21 10:03	11/15/21 14:22	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.55**	mg/kg	0.022	0.0097	1	11/09/21 10:19	11/16/21 13:57	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**16.1**	%	0.10	0.10	1		11/08/21 11:41		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

Sample: BPSOU-UR01SS08-110221-1 **Lab ID: 10586396009** Collected: 11/02/21 14:35 Received: 11/04/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**3.5**	mg/kg	1.1	0.17	1	11/09/21 10:03	11/15/21 14:43	7440-38-2	
Cadmium	**0.12J**	mg/kg	0.16	0.037	1	11/09/21 10:03	11/15/21 14:43	7440-43-9	
Copper	**41.7**	mg/kg	0.54	0.079	1	11/09/21 10:03	11/15/21 14:43	7440-50-8	
Lead	**18.9**	mg/kg	1.1	0.22	2	11/09/21 10:03	11/15/21 14:23	7439-92-1	
Zinc	**58.9**	mg/kg	2.2	0.24	1	11/09/21 10:03	11/15/21 14:43	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.019**	mg/kg	0.019	0.0085	1	11/09/21 10:19	11/16/21 13:59	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**12.0**	%	0.10	0.10	1		11/08/21 11:42		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

Sample: BPSOU-UR01SS08-110221-2 **Lab ID: 10586396010** Collected: 11/02/21 14:30 Received: 11/04/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**4.2**	mg/kg	1.0	0.16	1	11/09/21 10:03	11/15/21 14:45	7440-38-2	
Cadmium	**0.14J**	mg/kg	0.15	0.035	1	11/09/21 10:03	11/15/21 14:45	7440-43-9	
Copper	**32.6**	mg/kg	0.51	0.075	1	11/09/21 10:03	11/15/21 14:45	7440-50-8	
Lead	**11.7**	mg/kg	1.0	0.21	2	11/09/21 10:03	11/15/21 14:29	7439-92-1	
Zinc	**51.6**	mg/kg	2.1	0.23	1	11/09/21 10:03	11/15/21 14:45	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.025**	mg/kg	0.019	0.0083	1	11/09/21 10:19	11/16/21 14:00	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**4.6**	%	0.10	0.10	1		11/08/21 11:42		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

Sample: BPSOU-UR01SS08-110221-3 **Lab ID: 10586396011** Collected: 11/02/21 14:25 Received: 11/04/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**4.1**	mg/kg	2.1	0.33	2	11/09/21 10:03	11/15/21 14:30	7440-38-2	
Cadmium	**0.40**	mg/kg	0.32	0.073	2	11/09/21 10:03	11/15/21 14:30	7440-43-9	
Copper	**40.1**	mg/kg	1.1	0.16	2	11/09/21 10:03	11/15/21 14:30	7440-50-8	
Lead	**12.1**	mg/kg	1.1	0.22	2	11/09/21 10:03	11/15/21 14:30	7439-92-1	
Zinc	**73.9**	mg/kg	4.3	0.48	2	11/09/21 10:03	11/15/21 14:30	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.012J**	mg/kg	0.020	0.0088	1	11/09/21 10:19	11/16/21 14:02	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**10.7**	%	0.10	0.10	1		11/08/21 11:42		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

Sample: BPSOU-UR01SS02-110321-2 **Lab ID: 10586396012** Collected: 11/03/21 10:25 Received: 11/04/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**2.4**	mg/kg	1.0	0.15	1	11/09/21 10:03	11/15/21 14:50	7440-38-2	
Cadmium	**0.11J**	mg/kg	0.15	0.034	1	11/09/21 10:03	11/15/21 14:50	7440-43-9	
Copper	**41.5**	mg/kg	0.50	0.073	1	11/09/21 10:03	11/15/21 14:50	7440-50-8	
Lead	**6.1**	mg/kg	1.0	0.21	2	11/09/21 10:03	11/15/21 14:32	7439-92-1	
Zinc	**46.1**	mg/kg	2.0	0.22	1	11/09/21 10:03	11/15/21 14:50	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.010J**	mg/kg	0.020	0.0088	1	11/09/21 10:19	11/16/21 14:04	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**4.6**	%	0.10	0.10	1		11/08/21 11:42		N2

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

Sample: BPSOU-UR01SS02-110321-2-FD **Lab ID: 10586396013** Collected: 11/03/21 10:20 Received: 11/04/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**2.3**	mg/kg	1.0	0.16	1	11/09/21 10:03	11/15/21 14:52	7440-38-2	
Cadmium	**0.14J**	mg/kg	0.15	0.035	1	11/09/21 10:03	11/15/21 14:52	7440-43-9	
Copper	**42.2**	mg/kg	0.51	0.075	1	11/09/21 10:03	11/15/21 14:52	7440-50-8	
Lead	**31.0**	mg/kg	1.0	0.21	2	11/09/21 10:03	11/15/21 14:34	7439-92-1	
Zinc	**53.1**	mg/kg	2.1	0.23	1	11/09/21 10:03	11/15/21 14:52	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**<0.0080**	mg/kg	0.019	0.0080	1	11/09/21 10:19	11/16/21 14:05	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**4.7**	%	0.10	0.10	1		11/08/21 11:43		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

QC Batch: 782132 — Analysis Method: EPA 7471B
QC Batch Method: EPA 7471B — Analysis Description: 7471B Mercury Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10586396001, 10586396002, 10586396003, 10586396004, 10586396005, 10586396006, 10586396007, 10586396008, 10586396009, 10586396010, 10586396011, 10586396012, 10586396013

METHOD BLANK: 4164994 — Matrix: Solid
Associated Lab Samples: 10586396001, 10586396002, 10586396003, 10586396004, 10586396005, 10586396006, 10586396007, 10586396008, 10586396009, 10586396010, 10586396011, 10586396012, 10586396013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	<0.0079	0.018	0.0079	11/16/21 13:36	

LABORATORY CONTROL SAMPLE: 4164995

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.45	0.45	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4164996 4164997

Parameter	Units	10586396001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.032	0.46	0.54	0.41	0.41	82	71	80-120	1	20	M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

QC Batch: 782085
QC Batch Method: EPA 3050B
Analysis Method: EPA 6010D
Analysis Description: 6010D Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10586396001, 10586396002, 10586396003, 10586396004, 10586396005, 10586396006, 10586396007, 10586396008, 10586396009, 10586396010, 10586396011, 10586396012, 10586396013

METHOD BLANK: 4164877 Matrix: Solid
Associated Lab Samples: 10586396001, 10586396002, 10586396003, 10586396004, 10586396005, 10586396006, 10586396007, 10586396008, 10586396009, 10586396010, 10586396011, 10586396012, 10586396013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/kg	<0.15	0.99	0.15	11/15/21 13:57	
Cadmium	mg/kg	<0.034	0.15	0.034	11/15/21 13:57	
Copper	mg/kg	<0.072	0.50	0.072	11/15/21 13:57	
Lead	mg/kg	<0.10	0.50	0.10	11/15/21 13:57	
Zinc	mg/kg	<0.22	2.0	0.22	11/15/21 13:57	

LABORATORY CONTROL SAMPLE: 4164878

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	45.9	43.8	96	80-120	
Cadmium	mg/kg	45.9	45.7	100	80-120	
Copper	mg/kg	45.9	44.4	97	80-120	
Lead	mg/kg	45.9	44.6	97	80-120	
Zinc	mg/kg	45.9	44.6	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4164879 4164880

Parameter	Units	10586396001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	9.4	50.4	49.6	51.1	53.4	83	89	75-125	4	20	
Cadmium	mg/kg	0.30	50.4	49.6	44.8	45.3	88	91	75-125	1	20	
Copper	mg/kg	59.2	50.4	49.6	98.5	98.4	78	79	75-125	0	20	
Lead	mg/kg	25.5	50.4	49.6	66.8	68.8	82	87	75-125	3	20	
Zinc	mg/kg	113	50.4	49.6	152	167	77	111	75-125	10	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

QC Batch: 782119
QC Batch Method: ASTM D2974
Analysis Method: ASTM D2974
Analysis Description: Dry Weight / %M by ASTM D2974
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10586396001, 10586396002, 10586396003, 10586396004, 10586396005, 10586396006, 10586396007, 10586396008, 10586396009, 10586396010, 10586396011, 10586396012, 10586396013

SAMPLE DUPLICATE: 4164952

Parameter	Units	10586396001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	7.4	8.1	9	30	N2

SAMPLE DUPLICATE: 4164953

Parameter	Units	10586396011 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	10.7	10.6	1	30	N2

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
N2	The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

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1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10586396

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10586396001	BPSOU-UR01SS13-110221-1	EPA 3050B	782085	EPA 6010D	782656
10586396002	BPSOU-UR01SS13-110221-2	EPA 3050B	782085	EPA 6010D	782656
10586396003	BPSOU-UR01SS13-110221-3	EPA 3050B	782085	EPA 6010D	782656
10586396004	BPSOU-UR01SS12-110221-2	EPA 3050B	782085	EPA 6010D	782656
10586396005	BPSOU-UR01SS11-110221-2	EPA 3050B	782085	EPA 6010D	782656
10586396006	BPSOU-UR01SS11-110221-3	EPA 3050B	782085	EPA 6010D	782656
10586396007	BPSOU-UR01SS10-110221-2	EPA 3050B	782085	EPA 6010D	782656
10586396008	BPSOU-UR01SS10-110221-3	EPA 3050B	782085	EPA 6010D	782656
10586396009	BPSOU-UR01SS08-110221-1	EPA 3050B	782085	EPA 6010D	782656
10586396010	BPSOU-UR01SS08-110221-2	EPA 3050B	782085	EPA 6010D	782656
10586396011	BPSOU-UR01SS08-110221-3	EPA 3050B	782085	EPA 6010D	782656
10586396012	BPSOU-UR01SS02-110321-2	EPA 3050B	782085	EPA 6010D	782656
10586396013	BPSOU-UR01SS02-110321-2-FD	EPA 3050B	782085	EPA 6010D	782656
10586396001	BPSOU-UR01SS13-110221-1	EPA 7471B	782132	EPA 7471B	782860
10586396002	BPSOU-UR01SS13-110221-2	EPA 7471B	782132	EPA 7471B	782860
10586396003	BPSOU-UR01SS13-110221-3	EPA 7471B	782132	EPA 7471B	782860
10586396004	BPSOU-UR01SS12-110221-2	EPA 7471B	782132	EPA 7471B	782860
10586396005	BPSOU-UR01SS11-110221-2	EPA 7471B	782132	EPA 7471B	782860
10586396006	BPSOU-UR01SS11-110221-3	EPA 7471B	782132	EPA 7471B	782860
10586396007	BPSOU-UR01SS10-110221-2	EPA 7471B	782132	EPA 7471B	782860
10586396008	BPSOU-UR01SS10-110221-3	EPA 7471B	782132	EPA 7471B	782860
10586396009	BPSOU-UR01SS08-110221-1	EPA 7471B	782132	EPA 7471B	782860
10586396010	BPSOU-UR01SS08-110221-2	EPA 7471B	782132	EPA 7471B	782860
10586396011	BPSOU-UR01SS08-110221-3	EPA 7471B	782132	EPA 7471B	782860
10586396012	BPSOU-UR01SS02-110321-2	EPA 7471B	782132	EPA 7471B	782860
10586396013	BPSOU-UR01SS02-110321-2-FD	EPA 7471B	782132	EPA 7471B	782860
10586396001	BPSOU-UR01SS13-110221-1	ASTM D2974	782119		
10586396002	BPSOU-UR01SS13-110221-2	ASTM D2974	782119		
10586396003	BPSOU-UR01SS13-110221-3	ASTM D2974	782119		
10586396004	BPSOU-UR01SS12-110221-2	ASTM D2974	782119		
10586396005	BPSOU-UR01SS11-110221-2	ASTM D2974	782119		
10586396006	BPSOU-UR01SS11-110221-3	ASTM D2974	782119		
10586396007	BPSOU-UR01SS10-110221-2	ASTM D2974	782119		
10586396008	BPSOU-UR01SS10-110221-3	ASTM D2974	782119		
10586396009	BPSOU-UR01SS08-110221-1	ASTM D2974	782119		
10586396010	BPSOU-UR01SS08-110221-2	ASTM D2974	782119		
10586396011	BPSOU-UR01SS08-110221-3	ASTM D2974	782119		
10586396012	BPSOU-UR01SS02-110321-2	ASTM D2974	782119		
10586396013	BPSOU-UR01SS02-110321-2-FD	ASTM D2974	782119		

WO# : 10586396

10586396

Laboratory Management Program (LaMP) Chain of Custody Rec

Soil, Sediment and Groundwater Samples

BP Site Node Path: _____ Req Due Date (mm/dd/yy): 11/17/21 Rush TAT Yes 14 day No _____

BP/RM Facility No: _____ Lab Work Order Number: _____

Lab Name: Pace Analytical	BP/ARC Facility Address:	Consultant/Contractor:	Pioneer Technical Services
Lab Address: 1700 Elm Street SE, Minneapolis, MN 55414	City, State, ZIP Code:	Consultant/Contractor Project No:	BPSOU Unreclaimed Sampling
Lab PM: Jennifer Anderson	Lead Regulatory Agency:	Address:	1101 S. Montana St.
Lab Phone: 612-607-6436	California Global ID No.:	Consultant/Contractor PM:	Scott Sampson
Lab Shipping Accnt:	Enfos Proposal No:	Phone: 406-697-0946 Email:	ssampson@pioneer-technical.com
Lab Bottle Order No:	Accounting Mode: Provision ____ OOC-BU ____ OOC-RM ____	Send/Submit EDD to:	Scott Sampson
Other Info:	Stage Activity	Invoice To:	BP-RM _____ BP-Other _____

BP/RM PM: Mike Mc Anulty

PM Phone: 406-723-1822

PM Email: mcanumc@bp.com

Requested Analyses

Report Type & QC Level

Limited (Standard) Package ___

Limited Plus Package ___

Full Package Level 2

Lab No.	Unique Sample ID, must follow format of SAMPLENAMEYYYYMMDD Examples: MW01_20190101; BH01_3-5_20190101	Time	Depth Unit	Grab (G) or Composite (C)	Total Number of Containers	Matrix	Analysis	Total Metals 6010 As, Cd, Cu, Pb, Zn	7471 Mercury	Comments
	BPSOU-UR01SS13-110221-1	15:00	in	c	1	soil		x	x	
	BPSOU-UR01SS13-110221-2	14:55	in	c	1	soil		x	x	
	BPSOU-UR01SS13-110221-3	14:50	in	c	1	soil		x	x	
	BPSOU-UR01SS12-110221-2	15:20	in	c	1	soil		x	x	
	BPSOU-UR01SS11-110221-2	15:20	in	c	1	soil		x	x	
	BPSOU-UR01SS11-110221-3	15:15	in	c	1	soil		x	x	
	BPSOU-UR01SS10-110221-2	15:00	in	c	1	soil		x	x	

Sampler's Name: Jesse Sims	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Pioneer Technical Services	Jesse Sims/PTS	11/3/2021	1600	[illegible]/PACE	11/4/21	850
Ship Method: FedEx Overnight 11/3/2021						
Shipment Tracking No: 4278 9934 6406						

Special Instructions: *Maximum 14 day TAT

THIS LINE - LAB USE ONLY: Custody Seals In Place: (Yes) / No | Temp Blank: (Yes) / No | Cooler Temp on Receipt: 2-8 °F (C) | Trip Blank: Yes / (No) | MS/MSD Sample Submitted: Yes / (No)

BP LaMP Soil/H2O COC March 2019

Laboratory Management Program (LaMP) Chain of Custody Record

Soil, Sediment and Groundwater Samples

BP Site Node Path: _____ Req Due Date (mm/dd/yy): 11/17/21 Rush TAT Yes 14 day No _____

BP/RM Facility No: _____ Lab Work Order Number: _____

Lab Name:	Pace Analytical	BP/ARC Facility Address:		Consultant/Contractor:	Pioneer Technical Services
Lab Address:	1700 Elm Street SE, Minneapolis, MN 55414	City, State, ZIP Code:		Consultant/Contractor Project No:	BPSOU Unreclaimed Sampling
Lab PM:	Jennifer Anderson	Lead Regulatory Agency:		Address:	1101 S. Montana St.
Lab Phone:	612-607-6436	California Global ID No.:		Consultant/Contractor PM:	Scott Sampson
Lab Shipping Accnt:		Enfos Proposal No:		Phone: 406-697-0946 Email:	ssampson@pioneer-technical.com
Lab Bottle Order No:		Accounting Mode: Provision ____ OOC-BU ____ OOC-RM ____		Send/Submit EDD to:	Scott Sampson
Other Info:		Stage Activity		Invoice To:	BP-RM _____ BP-Other _____

BP/RM PM:	Mike Mc Anulty
PM Phone:	406-723-1822
PM Email:	mcanumc@bp.com

Requested Analyses

Report Type & QC Level

Limited (Standard) Package ___

Limited Plus Package ___

Full Package Level 2

Lab No.	Unique Sample ID, must follow format of SAMPLENAMEYYYYMMDD Examples: MW01_20190101; BH01_3-5_20190101	Time	Depth Unit	Grab (G) or Composite (C)	Total Number of Containers	Matrix	Analysis	Total Metals 6010 As, Cd, Cu, Pb, Zn	7471 Mercury	Comments
	BPSOU-UR01SS10-110221-3	14:55	in	c	1	soil		x	x	08
	BPSOU-UR01SS08-110221-1	14:35	in	c	1	soil		x	x	09
	BPSOU-UR01SS08-110221-2	14:30	in	c	1	soil		x	x	10
	BPSOU-UR01SS08-110221-3	14:25	in	c	1	soil		x	x	11
	BPSOU-UR01SS02-110221-2	10:25	in	c	1	soil		x	x	12
	BPSOU-UR01SS02-110221-2-FD	10:20	in	c	1	soil		x	x	13
										14

MK 11-4-21

		Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Name:	Jesse Sims						
Sampler's Company:	Pioneer Technical Services	Jesse Sims/PTS	11/3/2021	1600	[illegible] BP/PACE	11/4/21	850
Ship Method:	FedEx Overnight 11/3/2021						
Shipment Tracking No:	4278 9934 6406						

Special Instructions: *Maximum 14 day TAT

THIS LINE - LAB USE ONLY: Custody Seals In Place: (Yes) / No | Temp Blank (Yes) / No | Cooler Temp on Receipt: 2.8 °F/(C) | Trip Blank: Yes / (No) | MS/MSD Sample Submitted: Yes / (No)

BP LaMP Soil/H2O COC March 2019

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - ESI**	Document Revised: 12Aug2020 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0149 Rev.01**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt – ESI Tech Specs

Client Name: BP - Pioneer Technical Services

Project #: **WO#: 10586396**

PM: JMA Due Date: 11/17/21

CLIENT: BP-PIONEER

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Pace ☐ SpeeDee ☐ Commercial

Tracking Number: 4278 9934 6406 See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☒ Yes ☐ No **Seals Intact?** ☒ Yes ☐ No **Biological Tissue Frozen?** ☐ Yes ☐ No ☒ N/A

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☒ None ☐ Other: _____ **Temp Blank?** ☒ Yes ☐ No

Thermometer: ☐ T1(0461) ☐ T2(1336) ☒ T3(0459) ☐ T4(0254) ☐ T5(0489) **Type of Ice:** ☒ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 2.8 °C **Average Corrected Temp (no temp blank only):** _____ °C ☐ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container

Correction Factor: true **Cooler Temp Corrected w/temp blank:** 2.8 °C

USDA Regulated Soil: (☐ N/A, water sample/Other: _____) **Date/Initials of Person Examining Contents:** HB 11/4/21

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☒ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☒ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☒ Yes	☐ No		1.
Chain of Custody Relinquished?	☒ Yes	☐ No		2.
Sampler Name and/or Signature on COC?	☒ Yes	☐ No	☐ N/A	3.
Samples Arrived within Hold Time?	☒ Yes	☐ No		4.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☒ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E coli ☐ BOD/cBOD ☐ Hex Chrome ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐
Rush Turn Around Time Requested?	☐ Yes	☒ No		6. 14 day
Sufficient Sample Volume?	☒ Yes	☐ No		
Triple Volume Provided for MS/MSD (if more than 10 samples)?	☐ Yes	☒ No	☐ N/A	7.
Correct Containers Used?	☒ Yes	☐ No		8.
-Pace Containers Used?	☐ Yes	☒ No		
Containers Intact?	☒ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☒ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC	☒ Yes	☐ No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ ENV-FRM-MIN4-0142
Matrix: ☐ Water ☒ Soil ☐ Oil ☐ Other _____				
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☒ N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐ Yes	☐ No	☒ N/A	☐ NaOH ☐ HNO_3 ☐ H_2SO_4 ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS *If adding preservative to a container it must be added to associated field and equipment blanks (verify with PM first)	☐ Yes	☐ No	☒ N/A	Positive for Res. Chlorine? ☐ Yes ☐ No **pH Paper Lot#** **See Exception** ☐ ENV-FRM-MIN4-0142
				Res. Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO contaners?	☐ Yes	☐ No	☒ N/A	13. **See Exception** ☐ ENV-FRM-MIN4-0140
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☐ No	☒ N/A	
3 Trip Blanks Present?	☐ Yes	☐ No	☒ N/A	14.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☒ N/A	Pace Trip Blank Lot # (if purchased): _____

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: 1350	Temp: 2.8	Corrected Temp: 2.8
Time:	put in cooler	
Time: 1410	Temp: 3.0	Corrected Temp: 3.0

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution: Received email from Jesse regarding sample ID updates.

Project Manager Review: _____ **Date:** 11/07/2021

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Labeled by: HB (3)

From: Jesse Sims
To: Jennifer Anderson
Subject: COC error
Date: Thursday, November 4, 2021 9:08:37 AM

Hello,

I just found an error on a COC we sent yesterday tracking number 427899346406 page 2, BPSOU-UR01SS02-110221-2 and BPSOU-UR01SS02-110221-2-FD need to be updated to BPSOU-UR01SS02-110321-2 and BPSOU-UR01SS02-110321-2-FD. Wanted you to be aware because the sample bags will not match the COC.

Jesse Sims
Butte Staff Engineer

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

November 22, 2021

Scott Sampson
Pioneer Technical Services
1101 S. Montana Street
Butte, MT 59701

RE: Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Dear Scott Sampson:

Enclosed are the analytical results for sample(s) received by the laboratory on November 11, 2021. The results relate only to the samples included in this report. Results contained within this report conform to the most current version of the TNI standards, BP LaMP Technical Requirements Revision 12.1, and any applicable Quality Assurance Project Plan (QAPP), or Work Plan unless otherwise narrated in the body of this report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Pace Analytical Services, LLC - Minneapolis MN
1700 Elm Street SE, Minneapolis, MN 55414
A2LA Certification #: 2926.01*
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009*
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014*
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8 Tribal Water Systems+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605*
Georgia Certification #: 959
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086*
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064*
Maryland Certification #: 322
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137*
Minnesota Dept of Ag Approval: via MN 027-053-137
Minnesota Petrofund Registration #: 1240*
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081*
New Jersey Certification #: MN002
New York Certification #: 11647*
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification (1700) #: CL101
Ohio VAP Certification (1800) #: CL110*
Oklahoma Certification #: 9507*
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001*
Pennsylvania Certification #: 68-00563*
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192*
Utah Certification #: MN00064*
Vermont Certification #: VT-027053137
Virginia Certification #: 460163*
Washington Certification #: C486*
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208
*Please Note: Applicable air certifications are denoted with an asterisk (*).

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10587272001	**BPSOU-UR01SS03-110321-1**	Solid	11/03/21 09:45	11/11/21 08:50
10587272002	**BPSOU-UR01SS03-110321-2**	Solid	11/03/21 09:40	11/11/21 08:50
10587272003	**BPSOU-UR01SS03-110321-3**	Solid	11/03/21 09:35	11/11/21 08:50
10587272004	**BPSOU-UR01SS04-110321-1**	Solid	11/03/21 09:55	11/11/21 08:50
10587272005	**BPSOU-UR01SS04-110321-2**	Solid	11/03/21 09:50	11/11/21 08:50
10587272006	**BPSOU-UR01SS04-110321-3**	Solid	11/03/21 09:45	11/11/21 08:50
10587272007	**BPSOU-UR01SS05-110321-1**	Solid	11/03/21 11:05	11/11/21 08:50
10587272008	**BPSOU-UR01SS05-110321-2**	Solid	11/03/21 11:00	11/11/21 08:50
10587272009	**BPSOU-UR01SS05-110321-3**	Solid	11/03/21 10:55	11/11/21 08:50
10587272010	**BPSOU-UR01SS06-110321-1**	Solid	11/03/21 10:55	11/11/21 08:50
10587272011	**BPSOU-UR01SS06-110321-1-FD**	Solid	11/03/21 11:00	11/11/21 08:50
10587272012	**BPSOU-UR01SS06-110321-2**	Solid	11/03/21 10:50	11/11/21 08:50
10587272013	**BPSOU-UR01SS07-110321-1**	Solid	11/03/21 10:50	11/11/21 08:50
10587272014	**BPSOU-UR01SS07-110321-2**	Solid	11/03/21 10:40	11/11/21 08:50

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10587272001	BPSOU-UR01SS03-110321-1	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587272002	BPSOU-UR01SS03-110321-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587272003	BPSOU-UR01SS03-110321-3	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587272004	BPSOU-UR01SS04-110321-1	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587272005	BPSOU-UR01SS04-110321-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587272006	BPSOU-UR01SS04-110321-3	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587272007	BPSOU-UR01SS05-110321-1	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587272008	BPSOU-UR01SS05-110321-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587272009	BPSOU-UR01SS05-110321-3	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587272010	BPSOU-UR01SS06-110321-1	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587272011	BPSOU-UR01SS06-110321-1-FD	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587272012	BPSOU-UR01SS06-110321-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587272013	BPSOU-UR01SS07-110321-1	EPA 6010D	DM	5

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587272014	**BPSOU-UR01SS07-110321-2**	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1

PASI-M = Pace Analytical Services - Minneapolis

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Method: **EPA 6010D**
Description: 6010D MET ICP
Client: BPAR-PIONEER-MT
Date: November 22, 2021

General Information:
14 samples were analyzed for EPA 6010D by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 783304

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10587272001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MSD (Lab ID: 4170175)
  - Zinc

Additional Comments:

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Method: **EPA 7471B**
Description: 7471B Mercury
Client: BPAR-PIONEER-MT
Date: November 22, 2021

General Information:
14 samples were analyzed for EPA 7471B by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 783306

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10587272001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 4170182)
  - Mercury
- MSD (Lab ID: 4170183)
  - Mercury

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Sample: BPSOU-UR01SS03-110321-1 **Lab ID: 10587272001** Collected: 11/03/21 09:45 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**3.7**	mg/kg	1.3	0.20	1	11/12/21 14:18	11/17/21 13:24	7440-38-2	
Cadmium	**0.23**	mg/kg	0.19	0.044	1	11/12/21 14:18	11/17/21 13:24	7440-43-9	
Copper	**68.6**	mg/kg	0.64	0.093	1	11/12/21 14:18	11/17/21 13:24	7440-50-8	
Lead	**13.8**	mg/kg	1.3	0.26	2	11/12/21 14:18	11/17/21 12:37	7439-92-1	
Zinc	**71.7**	mg/kg	2.6	0.29	1	11/12/21 14:18	11/17/21 13:24	7440-66-6	M1
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**<0.010**	mg/kg	0.023	0.010	1	11/12/21 15:07	11/21/21 11:23	7439-97-6	M1
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**26.2**	%	0.10	0.10	1		11/12/21 13:03		N2

REPORT OF LABORATORY ANALYSIS

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Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Sample: BPSOU-UR01SS03-110321-2 **Lab ID: 10587272002** Collected: 11/03/21 09:40 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**9.2**	mg/kg	1.1	0.17	1	11/12/21 14:18	11/17/21 13:38	7440-38-2	
Cadmium	**0.24**	mg/kg	0.16	0.037	1	11/12/21 14:18	11/17/21 13:38	7440-43-9	
Copper	**63.1**	mg/kg	0.55	0.080	1	11/12/21 14:18	11/17/21 13:38	7440-50-8	
Lead	**10.7**	mg/kg	1.1	0.23	2	11/12/21 14:18	11/17/21 12:49	7439-92-1	
Zinc	**92.0**	mg/kg	2.2	0.24	1	11/12/21 14:18	11/17/21 13:38	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**<0.0088**	mg/kg	0.020	0.0088	1	11/12/21 15:07	11/21/21 11:28	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**15.4**	%	0.10	0.10	1		11/12/21 13:03		N2

REPORT OF LABORATORY ANALYSIS

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Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Sample: BPSOU-UR01SS03-110321-3 **Lab ID: 10587272003** Collected: 11/03/21 09:35 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**2.3**	mg/kg	1.1	0.17	1	11/12/21 14:18	11/17/21 13:39	7440-38-2	
Cadmium	**0.18**	mg/kg	0.17	0.038	1	11/12/21 14:18	11/17/21 13:39	7440-43-9	
Copper	**39.5**	mg/kg	0.56	0.082	1	11/12/21 14:18	11/17/21 13:39	7440-50-8	
Lead	**8.3**	mg/kg	1.1	0.23	2	11/12/21 14:18	11/17/21 12:50	7439-92-1	
Zinc	**65.7**	mg/kg	2.2	0.25	1	11/12/21 14:18	11/17/21 13:39	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**<0.0088**	mg/kg	0.020	0.0088	1	11/12/21 15:07	11/21/21 11:30	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**15.2**	%	0.10	0.10	1		11/12/21 13:03		N2

REPORT OF LABORATORY ANALYSIS

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Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Sample: BPSOU-UR01SS04-110321-1 **Lab ID: 10587272004** Collected: 11/03/21 09:55 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**2.8**	mg/kg	1.0	0.16	1	11/12/21 14:18	11/17/21 13:41	7440-38-2	
Cadmium	**0.18**	mg/kg	0.15	0.035	1	11/12/21 14:18	11/17/21 13:41	7440-43-9	
Copper	**49.7**	mg/kg	0.51	0.075	1	11/12/21 14:18	11/17/21 13:41	7440-50-8	
Lead	**16.9**	mg/kg	1.0	0.21	2	11/12/21 14:18	11/17/21 12:52	7439-92-1	
Zinc	**73.6**	mg/kg	2.0	0.23	1	11/12/21 14:18	11/17/21 13:41	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**<0.0088**	mg/kg	0.020	0.0088	1	11/12/21 10:58	11/18/21 12:35	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**7.9**	%	0.10	0.10	1		11/12/21 13:04		N2

REPORT OF LABORATORY ANALYSIS

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(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Sample: BPSOU-UR01SS04-110321-2 **Lab ID: 10587272005** Collected: 11/03/21 09:50 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**3.0**	mg/kg	1.0	0.16	1	11/12/21 14:18	11/17/21 13:43	7440-38-2	
Cadmium	**0.13J**	mg/kg	0.16	0.035	1	11/12/21 14:18	11/17/21 13:43	7440-43-9	
Copper	**61.4**	mg/kg	0.52	0.076	1	11/12/21 14:18	11/17/21 13:43	7440-50-8	
Lead	**13.5**	mg/kg	1.0	0.21	2	11/12/21 14:18	11/17/21 12:54	7439-92-1	
Zinc	**59.0**	mg/kg	2.1	0.23	1	11/12/21 14:18	11/17/21 13:43	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**<0.0084**	mg/kg	0.019	0.0084	1	11/12/21 10:58	11/18/21 12:36	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**6.5**	%	0.10	0.10	1		11/12/21 13:04		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Sample: BPSOU-UR01SS04-110321-3 **Lab ID: 10587272006** Collected: 11/03/21 09:45 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**1.7**	mg/kg	1.0	0.15	1	11/12/21 14:18	11/17/21 13:44	7440-38-2	
Cadmium	**0.065J**	mg/kg	0.15	0.035	1	11/12/21 14:18	11/17/21 13:44	7440-43-9	
Copper	**35.9**	mg/kg	0.51	0.074	1	11/12/21 14:18	11/17/21 13:44	7440-50-8	
Lead	**3.9**	mg/kg	1.0	0.21	2	11/12/21 14:18	11/17/21 12:55	7439-92-1	
Zinc	**42.8**	mg/kg	2.0	0.23	1	11/12/21 14:18	11/17/21 13:44	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**<0.0090**	mg/kg	0.021	0.0090	1	11/12/21 15:07	11/21/21 11:31	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**6.9**	%	0.10	0.10	1		11/12/21 13:04		N2

REPORT OF LABORATORY ANALYSIS

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(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Sample: BPSOU-UR01SS05-110321-1 **Lab ID: 10587272007** Collected: 11/03/21 11:05 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**5.2**	mg/kg	1.1	0.16	1	11/12/21 14:18	11/17/21 13:46	7440-38-2	
Cadmium	**0.56**	mg/kg	0.16	0.037	1	11/12/21 14:18	11/17/21 13:46	7440-43-9	
Copper	**41.8**	mg/kg	0.54	0.079	1	11/12/21 14:18	11/17/21 13:46	7440-50-8	
Lead	**56.2**	mg/kg	1.1	0.22	2	11/12/21 14:18	11/17/21 12:57	7439-92-1	
Zinc	**158**	mg/kg	2.2	0.24	1	11/12/21 14:18	11/17/21 13:46	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.24**	mg/kg	0.019	0.0084	1	11/12/21 15:07	11/21/21 11:36	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**8.8**	%	0.10	0.10	1		11/12/21 13:04		N2

REPORT OF LABORATORY ANALYSIS

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(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Sample: BPSOU-UR01SS05-110321-2 **Lab ID: 10587272008** Collected: 11/03/21 11:00 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**4.3**	mg/kg	0.99	0.15	1	11/12/21 14:18	11/17/21 13:48	7440-38-2	
Cadmium	**0.40**	mg/kg	0.15	0.034	1	11/12/21 14:18	11/17/21 13:48	7440-43-9	
Copper	**42.1**	mg/kg	0.50	0.073	1	11/12/21 14:18	11/17/21 13:48	7440-50-8	
Lead	**58.7**	mg/kg	0.99	0.20	2	11/12/21 14:18	11/17/21 12:59	7439-92-1	
Zinc	**152**	mg/kg	2.0	0.22	1	11/12/21 14:18	11/17/21 13:48	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.35**	mg/kg	0.019	0.0081	1	11/12/21 15:07	11/21/21 11:38	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**5.1**	%	0.10	0.10	1		11/12/21 13:04		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Sample: BPSOU-UR01SS05-110321-3 **Lab ID: 10587272009** Collected: 11/03/21 10:55 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**4.4**	mg/kg	1.2	0.18	1	11/12/21 14:18	11/17/21 13:49	7440-38-2	
Cadmium	**0.52**	mg/kg	0.18	0.040	1	11/12/21 14:18	11/17/21 13:49	7440-43-9	
Copper	**37.8**	mg/kg	0.59	0.086	1	11/12/21 14:18	11/17/21 13:49	7440-50-8	
Lead	**40.6**	mg/kg	1.2	0.24	2	11/12/21 14:18	11/17/21 13:00	7439-92-1	
Zinc	**141**	mg/kg	2.4	0.26	1	11/12/21 14:18	11/17/21 13:49	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.84**	mg/kg	0.022	0.0094	1	11/12/21 15:07	11/21/21 11:39	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**18.4**	%	0.10	0.10	1		11/12/21 13:05		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Sample: BPSOU-UR01SS06-110321-1 **Lab ID: 10587272010** Collected: 11/03/21 10:55 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**3.2**	mg/kg	1.0	0.16	1	11/12/21 14:18	11/17/21 13:51	7440-38-2	
Cadmium	**0.14J**	mg/kg	0.16	0.035	1	11/12/21 14:18	11/17/21 13:51	7440-43-9	
Copper	**40.0**	mg/kg	0.52	0.076	1	11/12/21 14:18	11/17/21 13:51	7440-50-8	
Lead	**22.4**	mg/kg	1.0	0.21	2	11/12/21 14:18	11/17/21 13:02	7439-92-1	
Zinc	**53.5**	mg/kg	2.1	0.23	1	11/12/21 14:18	11/17/21 13:51	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.016J**	mg/kg	0.018	0.0080	1	11/12/21 15:07	11/21/21 11:41	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**7.1**	%	0.10	0.10	1		11/12/21 13:05		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Sample: BPSOU-UR01SS06-110321-1-FD **Lab ID: 10587272011** Collected: 11/03/21 11:00 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**3.2**	mg/kg	1.0	0.15	1	11/12/21 14:18	11/17/21 13:53	7440-38-2	
Cadmium	**0.13J**	mg/kg	0.15	0.035	1	11/12/21 14:18	11/17/21 13:53	7440-43-9	
Copper	**42.8**	mg/kg	0.51	0.074	1	11/12/21 14:18	11/17/21 13:53	7440-50-8	
Lead	**18.6**	mg/kg	1.0	0.21	2	11/12/21 14:18	11/17/21 13:04	7439-92-1	
Zinc	**55.5**	mg/kg	2.0	0.23	1	11/12/21 14:18	11/17/21 13:53	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.017J**	mg/kg	0.018	0.0080	1	11/12/21 15:07	11/21/21 11:42	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**6.8**	%	0.10	0.10	1		11/12/21 13:05		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Sample: BPSOU-UR01SS06-110321-2 **Lab ID: 10587272012** Collected: 11/03/21 10:50 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**3.4**	mg/kg	1.0	0.16	1	11/12/21 14:18	11/17/21 13:58	7440-38-2	
Cadmium	**0.18**	mg/kg	0.15	0.035	1	11/12/21 14:18	11/17/21 13:58	7440-43-9	
Copper	**38.2**	mg/kg	0.51	0.075	1	11/12/21 14:18	11/17/21 13:58	7440-50-8	
Lead	**9.1**	mg/kg	1.0	0.21	2	11/12/21 14:18	11/17/21 13:09	7439-92-1	
Zinc	**49.9**	mg/kg	2.1	0.23	1	11/12/21 14:18	11/17/21 13:58	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.022**	mg/kg	0.018	0.0079	1	11/12/21 15:07	11/21/21 11:44	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**5.4**	%	0.10	0.10	1		11/12/21 13:05		N2

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1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Sample: BPSOU-UR01SS07-110321-1 **Lab ID: 10587272013** Collected: 11/03/21 10:50 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**2.0**	mg/kg	1.0	0.16	1	11/12/21 14:18	11/17/21 13:59	7440-38-2	
Cadmium	**0.17**	mg/kg	0.15	0.035	1	11/12/21 14:18	11/17/21 13:59	7440-43-9	
Copper	**31.2**	mg/kg	0.51	0.074	1	11/12/21 14:18	11/17/21 13:59	7440-50-8	
Lead	**9.2**	mg/kg	1.0	0.21	2	11/12/21 14:18	11/17/21 13:11	7439-92-1	
Zinc	**55.5**	mg/kg	2.0	0.23	1	11/12/21 14:18	11/17/21 13:59	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.013J**	mg/kg	0.020	0.0086	1	11/12/21 15:07	11/21/21 11:46	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**5.1**	%	0.10	0.10	1		11/12/21 13:05		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Sample: BPSOU-UR01SS07-110321-2 **Lab ID: 10587272014** Collected: 11/03/21 10:40 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**1.5**	mg/kg	1.0	0.16	1	11/12/21 14:18	11/17/21 14:01	7440-38-2	
Cadmium	**0.18**	mg/kg	0.15	0.035	1	11/12/21 14:18	11/17/21 14:01	7440-43-9	
Copper	**29.5**	mg/kg	0.51	0.075	1	11/12/21 14:18	11/17/21 14:01	7440-50-8	
Lead	**5.8**	mg/kg	1.0	0.21	2	11/12/21 14:18	11/17/21 13:14	7439-92-1	
Zinc	**46.6**	mg/kg	2.1	0.23	1	11/12/21 14:18	11/17/21 14:01	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**<0.0084**	mg/kg	0.019	0.0084	1	11/12/21 15:07	11/21/21 11:49	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**3.7**	%	0.10	0.10	1		11/12/21 13:06		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

QC Batch: 783302
QC Batch Method: EPA 7471B
Analysis Method: EPA 7471B
Analysis Description: 7471B Mercury Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10587272004, 10587272005

METHOD BLANK: 4170164 Matrix: Solid
Associated Lab Samples: 10587272004, 10587272005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	<0.0079	0.018	0.0079	11/18/21 11:57	

LABORATORY CONTROL SAMPLE: 4170165

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.47	0.46	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4170166 4170167

Parameter	Units	10587279001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	ND	0.51	0.49	0.52	0.49	100	97	80-120	6	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

QC Batch: 783306 Analysis Method: EPA 7471B
QC Batch Method: EPA 7471B Analysis Description: 7471B Mercury Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10587272001, 10587272002, 10587272003, 10587272006, 10587272007, 10587272008, 10587272009, 10587272010, 10587272011, 10587272012, 10587272013, 10587272014

METHOD BLANK: 4170180 Matrix: Solid
Associated Lab Samples: 10587272001, 10587272002, 10587272003, 10587272006, 10587272007, 10587272008, 10587272009, 10587272010, 10587272011, 10587272012, 10587272013, 10587272014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	<0.0079	0.018	0.0079	11/21/21 11:20	

LABORATORY CONTROL SAMPLE: 4170181

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.47	0.48	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4170182 4170183

Parameter	Units	10587272001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	<0.010	0.61	0.58	0.49	0.45	78	76	80-120	8	20	M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

QC Batch: 783304
QC Batch Method: EPA 3050B
Analysis Method: EPA 6010D
Analysis Description: 6010D Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10587272001, 10587272002, 10587272003, 10587272004, 10587272005, 10587272006, 10587272007, 10587272008, 10587272009, 10587272010, 10587272011, 10587272012, 10587272013, 10587272014

METHOD BLANK: 4170172 Matrix: Solid
Associated Lab Samples: 10587272001, 10587272002, 10587272003, 10587272004, 10587272005, 10587272006, 10587272007, 10587272008, 10587272009, 10587272010, 10587272011, 10587272012, 10587272013, 10587272014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/kg	<0.15	0.97	0.15	11/17/21 12:34	
Cadmium	mg/kg	<0.033	0.15	0.033	11/17/21 12:34	
Copper	mg/kg	<0.071	0.49	0.071	11/17/21 12:34	
Lead	mg/kg	<0.10	0.49	0.10	11/17/21 12:34	
Zinc	mg/kg	<0.22	1.9	0.22	11/17/21 12:34	

LABORATORY CONTROL SAMPLE: 4170173

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	46.7	42.8	92	80-120	
Cadmium	mg/kg	46.7	46.4	99	80-120	
Copper	mg/kg	46.7	45.2	97	80-120	
Lead	mg/kg	46.7	45.1	97	80-120	
Zinc	mg/kg	46.7	45.4	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4170174 4170175

Parameter	Units	10587272001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	3.7	65.2	64	54.5	53.2	78	77	75-125	2	20	
Cadmium	mg/kg	0.23	65.2	64	53.5	52.4	82	82	75-125	2	20	
Copper	mg/kg	68.6	65.2	64	123	122	84	83	75-125	1	20	
Lead	mg/kg	13.8	65.2	64	71.8	74.0	89	94	75-125	3	20	
Zinc	mg/kg	71.7	65.2	64	123	116	79	69	75-125	6	20	M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

QC Batch: 783390
QC Batch Method: ASTM D2974
Analysis Method: ASTM D2974
Analysis Description: Dry Weight / %M by ASTM D2974
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10587272001, 10587272002, 10587272003, 10587272004, 10587272005, 10587272006, 10587272007, 10587272008, 10587272009, 10587272010, 10587272011, 10587272012, 10587272013, 10587272014

SAMPLE DUPLICATE: 4170570

Parameter	Units	10587272001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	26.2	24.5	7	30	N2

SAMPLE DUPLICATE: 4170674

Parameter	Units	10586923013 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	17.1	17.2	0	30	N2

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

WORKORDER QUALIFIERS

WO: 10587272

[1]	The samples were received outside of required temperature range. Analysis was completed upon client approval.

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
N2	The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587272

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10587272001	**BPSOU-UR01SS03-110321-1**	EPA 3050B	783304	EPA 6010D	783590
10587272002	**BPSOU-UR01SS03-110321-2**	EPA 3050B	783304	EPA 6010D	783590
10587272003	**BPSOU-UR01SS03-110321-3**	EPA 3050B	783304	EPA 6010D	783590
10587272004	**BPSOU-UR01SS04-110321-1**	EPA 3050B	783304	EPA 6010D	783590
10587272005	**BPSOU-UR01SS04-110321-2**	EPA 3050B	783304	EPA 6010D	783590
10587272006	**BPSOU-UR01SS04-110321-3**	EPA 3050B	783304	EPA 6010D	783590
10587272007	**BPSOU-UR01SS05-110321-1**	EPA 3050B	783304	EPA 6010D	783590
10587272008	**BPSOU-UR01SS05-110321-2**	EPA 3050B	783304	EPA 6010D	783590
10587272009	**BPSOU-UR01SS05-110321-3**	EPA 3050B	783304	EPA 6010D	783590
10587272010	**BPSOU-UR01SS06-110321-1**	EPA 3050B	783304	EPA 6010D	783590
10587272011	**BPSOU-UR01SS06-110321-1-FD**	EPA 3050B	783304	EPA 6010D	783590
10587272012	**BPSOU-UR01SS06-110321-2**	EPA 3050B	783304	EPA 6010D	783590
10587272013	**BPSOU-UR01SS07-110321-1**	EPA 3050B	783304	EPA 6010D	783590
10587272014	**BPSOU-UR01SS07-110321-2**	EPA 3050B	783304	EPA 6010D	783590
10587272001	**BPSOU-UR01SS03-110321-1**	EPA 7471B	783306	EPA 7471B	783726
10587272002	**BPSOU-UR01SS03-110321-2**	EPA 7471B	783306	EPA 7471B	783726
10587272003	**BPSOU-UR01SS03-110321-3**	EPA 7471B	783306	EPA 7471B	783726
10587272004	**BPSOU-UR01SS04-110321-1**	EPA 7471B	783302	EPA 7471B	783727
10587272005	**BPSOU-UR01SS04-110321-2**	EPA 7471B	783302	EPA 7471B	783727
10587272006	**BPSOU-UR01SS04-110321-3**	EPA 7471B	783306	EPA 7471B	783726
10587272007	**BPSOU-UR01SS05-110321-1**	EPA 7471B	783306	EPA 7471B	783726
10587272008	**BPSOU-UR01SS05-110321-2**	EPA 7471B	783306	EPA 7471B	783726
10587272009	**BPSOU-UR01SS05-110321-3**	EPA 7471B	783306	EPA 7471B	783726
10587272010	**BPSOU-UR01SS06-110321-1**	EPA 7471B	783306	EPA 7471B	783726
10587272011	**BPSOU-UR01SS06-110321-1-FD**	EPA 7471B	783306	EPA 7471B	783726
10587272012	**BPSOU-UR01SS06-110321-2**	EPA 7471B	783306	EPA 7471B	783726
10587272013	**BPSOU-UR01SS07-110321-1**	EPA 7471B	783306	EPA 7471B	783726
10587272014	**BPSOU-UR01SS07-110321-2**	EPA 7471B	783306	EPA 7471B	783726
10587272001	**BPSOU-UR01SS03-110321-1**	ASTM D2974	783390		
10587272002	**BPSOU-UR01SS03-110321-2**	ASTM D2974	783390		
10587272003	**BPSOU-UR01SS03-110321-3**	ASTM D2974	783390		
10587272004	**BPSOU-UR01SS04-110321-1**	ASTM D2974	783390		
10587272005	**BPSOU-UR01SS04-110321-2**	ASTM D2974	783390		
10587272006	**BPSOU-UR01SS04-110321-3**	ASTM D2974	783390		
10587272007	**BPSOU-UR01SS05-110321-1**	ASTM D2974	783390		
10587272008	**BPSOU-UR01SS05-110321-2**	ASTM D2974	783390		
10587272009	**BPSOU-UR01SS05-110321-3**	ASTM D2974	783390		
10587272010	**BPSOU-UR01SS06-110321-1**	ASTM D2974	783390		
10587272011	**BPSOU-UR01SS06-110321-1-FD**	ASTM D2974	783390		
10587272012	**BPSOU-UR01SS06-110321-2**	ASTM D2974	783390		
10587272013	**BPSOU-UR01SS07-110321-1**	ASTM D2974	783390		
10587272014	**BPSOU-UR01SS07-110321-2**	ASTM D2974	783390		

REPORT OF LABORATORY ANALYSIS

Laboratory Management Program (LaMP) Chain of Custody Record
Soil, Sediment and Groundwater Samples

BP Site Node Path: _____ Req Due Date (mm/dd/yy): 11/22/21 Rush TAT Yes 14 day No _____

BP/RM Facility No: _____ Lab Work Order Number: _____

Lab Name: Pace Analytical	BP/ARC Facility Address:	Consultant/Contractor:	Pioneer Technical Services
Lab Address: 1700 Elm Street SE, Minneapolis, MN 55414	City, State, ZIP Code:	Consultant/Contractor Project No:	BPSOU Unreclaimed Sampling
Lab PM: Jennifer Anderson	Lead Regulatory Agency:	Address:	1101 S. Montana St.
Lab Phone: 612-607-6436	California Global ID No.:	Consultant/Contractor PM:	Scott Sampson
Lab Shipping Accnt:	Enfos Proposal No:	Phone: 406-697-0946 Email:	ssampson@pioneer-technical.com
Lab Bottle Order No:	Accounting Mode: Provision ____ OOC-BU ____ OOC-RM ____	Send/Submit EDD to:	Scott Sampson
Other Info:	Stage Activity	Invoice To:	BP-RM _____ BP-Other _____

BP/RM PM: Mike Mc Anulty

PM Phone: 406-723-1822

PM Email: mcanumc@bp.com

Report Type & QC Level

Limited (Standard) Package _

Limited Plus Package _

Full Package Level 2

WO# : 10587272

10587272

Lab No.	Unique Sample ID, must follow format of SAMPLENAMEYYYYMMDD Examples: MW01_20190101; BH01_3-5_20190101	Time	Depth Unit	Grab (G) or Composite (C)	Total Number of Containers	Matrix	Analysis	Total Metals 6010 As, Cd, Cu, Pb, Zn	7471 Mercury	
			Filtered (Y/N)							
			Preservation							
	BPSOU-UR01SS03-110321-1	9:45	in	c	1	soil		x	x	001
	BPSOU-UR01SS03-110321-2	9:40	in	c	1	soil		x	x	002
	BPSOU-UR01SS03-110321-3	9:35	in	c	1	soil		x	x	003
	BPSOU-UR01SS04-110321-1	9:55	in	c	1	soil		x	x	004
	BPSOU-UR01SS04-110321-2	9:50	in	c	1	soil		x	x	005
	BPSOU-UR01SS04-110321-3	9:45	in	c	1	soil		x	x	006
	BPSOU-UR01SS05-110321-1	11:05	in	c	1	soil		x	x	007

Sampler's Name: Jesse Sims	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Pioneer Technical Services	Jesse Sims/PTS	11/8/2021	1600	[signature] PACE	11/11/21	0850
Ship Method: FedEx Overnight Ship Date: 11/8/21						
Shipment Tracking No: 4378 9934 6428						

Special Instructions: *Maximum 14 day TAT

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: _____ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

BP LaMP Soil/H2O COC March 2019

Laboratory Management Program (LaMP) Chain of Custody Record
Soil, Sediment and Groundwater Samples

BP Site Node Path: _____ Req Due Date (mm/dd/yy): 11/22/21 Rush TAT Yes 14 day No _____

BP/RM Facility No: _____ Lab Work Order Number: _____

Lab Name: Pace Analytical	BP/ARC Facility Address:	Consultant/Contractor:	Pioneer Technical Services
Lab Address: 1700 Elm Street SE, Minneapolis, MN 55414	City, State, ZIP Code:	Consultant/Contractor Project No:	BPSOU Unreclaimed Sampling
Lab PM: Jennifer Anderson	Lead Regulatory Agency:	Address:	1101 S. Montana St.
Lab Phone: 612-607-6436	Califomia Global ID No.:	Consultant/Contractor PM:	Scott Sampson
Lab Shipping Accnt:	Enfos Proposal No:	Phone: 406-697-0946 Email:	ssampson@pioneer-technical.com
Lab Bottle Order No:	Accounting Mode: Provision ____ OOC-BU ____ OOC-RM ____	Send/Submit EDD to:	Scott Sampson
Other Info:	Stage Activity	Invoice To:	BP-RM _____ BP-Other _____

BP/RM PM: Mike Mc Anulty

PM Phone: 406-723-1822

PM Email: mcanumc@bp.com

Requested Analyses

Report Type & QC Level

Limited (Standard) Package —

Limited Plus Package —

Full Package Level 2

Lab No.	Unique Sample ID, must follow format of SAMPLENAMEYYYYMMDD Examples: MW01_20190101; BH01_3-5_20190101	Time	Depth Unit	Grab (G) or Composite (C)	Total Number of Containers	Matrix	Analysis: Total Metals 6010 As, Cd, Cu, Pb, Zn	Analysis: 7471 Mercury	Comments
	BPSOU-UR01SS05-110321-2	11:00	in	c	1	soil	x	x	008
	BPSOU-UR01SS05-110321-3	10:55	in	c	1	soil	x	x	009
	BPSOU-UR01SS06-110321-1	10:55	in	c	1	soil	x	x	010
	BPSOU-UR01SS06-110321-1-FD	11:00	in	c	1	soil	x	x	011
	BPSOU-UR01SS06-110321-2	10:50	in	c	1	soil	x	x	012
	BPSOU-UR01SS07-110321-1	10:50	in	c	1	soil	x	x	013
	BPSOU-UR01SS07-110321-2	10:40	in	c	1	soil	x	x	014

Sampler's Name: Jesse Sims	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Pioneer Technical Services	Jesse Sims/PTS	11/8/2021	1600	[illegible] PACE	11/11/21	0850
Ship Method: FedEx Overnight Ship Date: 11/8/21						
Shipment Tracking No: 4278 9934 6428						

Special Instructions: *Maximum 14 day TAT

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: _____ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

BP LaMP Soil/H2O COC March 2019

Pace Analytical	Document Name: **Sample Condition Upon Receipt (SCUR) - ESI**	Document Revised: 12Aug2020 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0149 Rev.01**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt – ESI Tech Specs

Client Name: bp rm (Lamp)

Project #: **WO#: 10587272**

PM: JMA Due Date: 11/24/21

CLIENT: BP-PIONEER

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Pace ☐ SpeeDee ☐ Commercial

Tracking Number: 427899340428 See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☑ Yes ☐ No **Seals Intact?** ☑ Yes ☐ No **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Packing Material: ☑ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other: _____ **Temp Blank?** ☑ Yes ☐ No

Thermometer: ☐ T1(0461) ☐ T2(1336) ☑ T3(0459) ☐ T4(0254) ☐ T5(0489) **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 8.5 °C **Average Corrected Temp (no temp blank only):** _____ °C ☐ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container

Correction Factor: -0.1 **Cooler Temp Corrected w/temp blank:** 8.4 °C

USDA Regulated Soil: (☐ N/A, water sample/Other: _____) **Date/Initials of Person Examining Contents:** JA 11-11-21

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present and Filled Out?	☑ Yes ☐ No	1.
Chain of Custody Relinquished?	☑ Yes ☐ No	2.
Sampler Name and/or Signature on COC?	☑ Yes ☐ No ☐ N/A	3.
Samples Arrived within Hold Time?	☑ Yes ☐ No	4.
Short Hold Time Analysis (<72 hr)?	☐ Yes ☑ No	5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E coli ☐ BOD/cBOD ☐ Hex Chrome ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐
Rush Turn Around Time Requested?	☑ Yes ☐ No	6.
Sufficient Sample Volume?	☑ Yes ☐ No	
Triple Volume Provided for MS/MSD (if more than 10 samples)?	☐ Yes ☑ No ☐ N/A	7.
Correct Containers Used?	☑ Yes ☐ No	8.
-Pace Containers Used?	☐ Yes ☑ No	
Containers Intact?	☑ Yes ☐ No	9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes ☐ No ☑ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC	☑ Yes ☐ No	11. **If no, write ID/ Date/Time on Container Below:** See Exception ☐ ENV-FRM-MIN4-0142
Matrix: ☐ Water ☑ Soil ☐ Oil ☐ Other _____		
All containers needing acid/base preservation have been checked?	☐ Yes ☐ No ☑ N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐ Yes ☐ No ☑ N/A	☐ NaOH ☐ HNO_3 ☐ H_2SO_4 ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS *If adding preservative to a container it must be added to associated field and equipment blanks (verify with PM first)	☐ Yes ☐ No ☑ N/A	Positive for Res. Chlorine? ☐ Yes ☐ No **pH Paper Lot#** See Exception ☐ ENV-FRM-MIN4-0142
		Res. Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO contaners?	☐ Yes ☐ No ☑ N/A	13. See Exception ☐ ENV-FRM-MIN4-0140
Headspace in VOA Vials (greater than 6mm)?	☐ Yes ☐ No ☑ N/A	
3 Trip Blanks Present?	☐ Yes ☐ No ☑ N/A	14.
Trip Blank Custody Seals Present?	☐ Yes ☐ No ☑ N/A	Pace Trip Blank Lot # (if purchased): _____

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins			**CLIENT NOTIFICATION/RESOLUTION**	**Field Data Required?** ☐ Yes ☐ No
Opened Time: 850	Temp: 8.3	Corrected Temp: 8.4	Person Contacted:	Date/Time:
Time:	put in cooler		Comments/Resolution: Notified of temperature.	
Time: 910	Temp: 8.3	Corrected Temp: 8.4		

Project Manager Review: _____ **Date:** 11/15/2021

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Labeled by: _____

From: Jennifer Anderson
To: Scott Sampson
Cc: Laura Moon
Subject: RE: Temperature - BPSOU Unreclaimed Sampling Pace Projects 10587272 / 10587273
Date: Friday, November 12, 2021 4:14:00 PM
Attachments: image001.png
image002.png

Sounds good, thank you Scott! We will proceed with the analyses.

Jennifer Anderson, PMP
Project Manager | Pace Environmental Sciences
Direct 612.607.6436 | Main 612.607.6400

Pace Analytical Services will be closed Thursday, November 25th and Friday, November 26th for the Thanksgiving Holiday. Please coordinate with your project manager to schedule any rush or short hold analyses around these dates.

From: Scott Sampson <ssampson@Pioneer-technical.com>
Sent: Friday, November 12, 2021 11:18 AM
To: Jennifer Anderson <Jennifer.Anderson@pacelabs.com>
Cc: Laura Moon <lmoon@pioneer-technical.com>
Subject: RE: Temperature - BPSOU Unreclaimed Sampling Pace Projects 10587272 / 10587273

Jennifer,

Thank you for the notification. FedEx is making things challenging...

Please proceed with analysis of samples on both COCs.

Thanks,
Scott

From: Jennifer Anderson <Jennifer.Anderson@pacelabs.com>
Sent: Friday, November 12, 2021 6:41 AM
To: Scott Sampson <ssampson@Pioneer-technical.com>
Subject: Temperature - BPSOU Unreclaimed Sampling Pace Projects 10587272 / 10587273

Good Morning Scott,

We received the samples for the attached COCs yesterday and it was noted that the samples were over 6 degrees Celsius. The temperature was noted to be 8.4 degrees Celsius. The 6010 metals are not temperature sensitive, but mercury in soils is temperature sensitive.

We can plan to proceed and qualify accordingly, please let me know if it would be preferred to not

proceed with either of these.

Thank you,
Jennifer

Jennifer Anderson, PMP
Project Manager | Pace Environmental Sciences
1700 Elm Street SE Suite 200, Minneapolis, MN 55414
Direct 612.607.6436 | Main 612.607.6400

Pace Analytical Services will be closed Thursday, November 25th and Friday, November 26th for the Thanksgiving Holiday. Please coordinate with your project manager to schedule any rush or short hold analyses around these dates.

Please let your Project Manager know if your project is related to a permit or if your permit has recently been updated.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

November 22, 2021

Scott Sampson
Pioneer Technical Services
1101 S. Montana Street
Butte, MT 59701

RE: Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Dear Scott Sampson:

Enclosed are the analytical results for sample(s) received by the laboratory on November 11, 2021. The results relate only to the samples included in this report. Results contained within this report conform to the most current version of the TNI standards, BP LaMP Technical Requirements Revision 12.1, and any applicable Quality Assurance Project Plan (QAPP), or Work Plan unless otherwise narrated in the body of this report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Pace Analytical Services, LLC - Minneapolis MN
1700 Elm Street SE, Minneapolis, MN 55414
A2LA Certification #: 2926.01*
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009*
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014*
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8 Tribal Water Systems+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605*
Georgia Certification #: 959
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086*
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064*
Maryland Certification #: 322
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137*
Minnesota Dept of Ag Approval: via MN 027-053-137
Minnesota Petrofund Registration #: 1240*
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081*
New Jersey Certification #: MN002
New York Certification #: 11647*
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification (1700) #: CL101
Ohio VAP Certification (1800) #: CL110*
Oklahoma Certification #: 9507*
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001*
Pennsylvania Certification #: 68-00563*
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192*
Utah Certification #: MN00064*
Vermont Certification #: VT-027053137
Virginia Certification #: 460163*
Washington Certification #: C486*
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208
*Please Note: Applicable air certifications are denoted with an asterisk (*).

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(612)607-1700

SAMPLE SUMMARY

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10587273001	**BPSOU-UR05SS02-110421-1**	Solid	11/04/21 09:20	11/11/21 08:50
10587273002	**BPSOU-UR05SS02-110421-1-FD**	Solid	11/04/21 09:25	11/11/21 08:50
10587273003	**BPSOU-UR05SS02-110421-2**	Solid	11/04/21 09:15	11/11/21 08:50
10587273004	**BPSOU-UR05SS02-110421-3**	Solid	11/04/21 09:10	11/11/21 08:50
10587273005	**BPSOU-UR05SS03-110421-1**	Solid	11/04/21 09:45	11/11/21 08:50
10587273006	**BPSOU-UR05SS03-110421-2**	Solid	11/04/21 09:40	11/11/21 08:50
10587273007	**BPSOU-UR05SS03-110421-3**	Solid	11/04/21 09:35	11/11/21 08:50
10587273008	**BPSOU-UR05SS04-110421-1**	Solid	11/04/21 09:10	11/11/21 08:50
10587273009	**BPSOU-UR05SS04-110421-2**	Solid	11/04/21 09:05	11/11/21 08:50
10587273010	**BPSOU-UR05SS04-110421-3**	Solid	11/04/21 09:00	11/11/21 08:50
10587273011	**BPSOU-UR05SS05-110421-1**	Solid	11/04/21 10:10	11/11/21 08:50
10587273012	**BPSOU-UR05SS05-110421-2**	Solid	11/04/21 10:05	11/11/21 08:50
10587273013	**BPSOU-UR05SS05-110421-3**	Solid	11/04/21 10:00	11/11/21 08:50
10587273014	**BPSOU-UR01SS07-110321-3**	Solid	11/03/21 10:35	11/11/21 08:50

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1700 Elm Street
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(612)607-1700

SAMPLE ANALYTE COUNT

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10587273001	BPSOU-UR05SS02-110421-1	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587273002	BPSOU-UR05SS02-110421-1-FD	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587273003	BPSOU-UR05SS02-110421-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587273004	BPSOU-UR05SS02-110421-3	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587273005	BPSOU-UR05SS03-110421-1	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587273006	BPSOU-UR05SS03-110421-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587273007	BPSOU-UR05SS03-110421-3	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587273008	BPSOU-UR05SS04-110421-1	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587273009	BPSOU-UR05SS04-110421-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587273010	BPSOU-UR05SS04-110421-3	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587273011	BPSOU-UR05SS05-110421-1	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587273012	BPSOU-UR05SS05-110421-2	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587273013	BPSOU-UR05SS05-110421-3	EPA 6010D	DM	5

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1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1
10587273014	**BPSOU-UR01SS07-110321-3**	EPA 6010D	DM	5
		EPA 7471B	LMW	1
		ASTM D2974	JDL	1

PASI-M = Pace Analytical Services - Minneapolis

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1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Method: **EPA 6010D**
Description: 6010D MET ICP
Client: BPAR-PIONEER-MT
Date: November 22, 2021

General Information:
14 samples were analyzed for EPA 6010D by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 783304

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10587272001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MSD (Lab ID: 4170175)
  - Zinc

QC Batch: 783305

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10587273002

P6: Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

- MS (Lab ID: 4170178)
  - Arsenic
  - Copper
  - Lead
  - Zinc
- MSD (Lab ID: 4170179)
  - Arsenic
  - Copper
  - Lead

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Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Method: **EPA 6010D**
Description: 6010D MET ICP
Client: BPAR-PIONEER-MT
Date: November 22, 2021

QC Batch: 783305

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10587273002

P6: Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

- Zinc

Additional Comments:

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(612)607-1700

PROJECT NARRATIVE

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Method: **EPA 7471B**
Description: 7471B Mercury
Client: BPAR-PIONEER-MT
Date: November 22, 2021

General Information:
14 samples were analyzed for EPA 7471B by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 783306

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10587272001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 4170182)
  - Mercury
- MSD (Lab ID: 4170183)
  - Mercury

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Sample: BPSOU-UR05SS02-110421-1 **Lab ID: 10587273001** Collected: 11/04/21 09:20 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**161**	mg/kg	2.2	0.34	2	11/12/21 14:18	11/17/21 13:12	7440-38-2	
Cadmium	**4.7**	mg/kg	0.34	0.076	2	11/12/21 14:18	11/17/21 13:12	7440-43-9	
Copper	**359**	mg/kg	1.1	0.16	2	11/12/21 14:18	11/17/21 13:12	7440-50-8	
Lead	**636**	mg/kg	1.1	0.23	2	11/12/21 14:18	11/17/21 13:12	7439-92-1	
Zinc	**1520**	mg/kg	4.5	0.50	2	11/12/21 14:18	11/17/21 13:12	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.25**	mg/kg	0.021	0.0091	1	11/12/21 15:07	11/21/21 11:47	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**13.4**	%	0.10	0.10	1		11/16/21 13:36		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Sample: BPSOU-UR05SS02-110421-1-FD **Lab ID: 10587273002** Collected: 11/04/21 09:25 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**203**	mg/kg	2.0	0.31	2	11/12/21 14:18	11/18/21 12:57	7440-38-2	P6
Cadmium	**4.6**	mg/kg	0.30	0.069	2	11/12/21 14:18	11/18/21 12:57	7440-43-9	
Copper	**519**	mg/kg	1.0	0.15	2	11/12/21 14:18	11/18/21 12:57	7440-50-8	P6
Lead	**630**	mg/kg	1.0	0.21	2	11/12/21 14:18	11/18/21 12:57	7439-92-1	P6
Zinc	**1720**	mg/kg	4.1	0.45	2	11/12/21 14:18	11/18/21 12:57	7440-66-6	P6
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.20**	mg/kg	0.019	0.0081	1	11/12/21 15:07	11/21/21 10:47	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**5.1**	%	0.10	0.10	1		11/16/21 13:37		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Sample: BPSOU-UR05SS02-110421-2 **Lab ID: 10587273003** Collected: 11/04/21 09:15 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**145**	mg/kg	2.0	0.30	2	11/12/21 14:18	11/18/21 13:09	7440-38-2	
Cadmium	**3.6**	mg/kg	0.30	0.068	2	11/12/21 14:18	11/18/21 13:09	7440-43-9	
Copper	**658**	mg/kg	0.99	0.14	2	11/12/21 14:18	11/18/21 13:09	7440-50-8	
Lead	**639**	mg/kg	0.99	0.20	2	11/12/21 14:18	11/18/21 13:09	7439-92-1	
Zinc	**1380**	mg/kg	4.0	0.44	2	11/12/21 14:18	11/18/21 13:09	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.31**	mg/kg	0.020	0.0086	1	11/12/21 15:07	11/21/21 10:52	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**5.7**	%	0.10	0.10	1		11/16/21 13:37		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Sample: BPSOU-UR05SS02-110421-3 **Lab ID: 10587273004** Collected: 11/04/21 09:10 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**62.3**	mg/kg	2.7	0.41	2	11/12/21 14:18	11/18/21 13:10	7440-38-2	
Cadmium	**3.8**	mg/kg	0.40	0.090	2	11/12/21 14:18	11/18/21 13:10	7440-43-9	
Copper	**235**	mg/kg	1.3	0.19	2	11/12/21 14:18	11/18/21 13:10	7440-50-8	
Lead	**756**	mg/kg	1.3	0.27	2	11/12/21 14:18	11/18/21 13:10	7439-92-1	
Zinc	**1500**	mg/kg	5.3	0.59	2	11/12/21 14:18	11/18/21 13:10	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.26**	mg/kg	0.026	0.011	1	11/12/21 15:07	11/21/21 10:54	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**26.8**	%	0.10	0.10	1		11/16/21 13:37		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Sample: BPSOU-UR05SS03-110421-1 **Lab ID: 10587273005** Collected: 11/04/21 09:45 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**234**	mg/kg	2.5	0.38	2	11/12/21 14:18	11/18/21 13:12	7440-38-2	
Cadmium	**8.7**	mg/kg	0.37	0.084	2	11/12/21 14:18	11/18/21 13:12	7440-43-9	
Copper	**1120**	mg/kg	1.2	0.18	2	11/12/21 14:18	11/18/21 13:12	7440-50-8	
Lead	**1980**	mg/kg	1.2	0.25	2	11/12/21 14:18	11/18/21 13:12	7439-92-1	
Zinc	**2450**	mg/kg	4.9	0.55	2	11/12/21 14:18	11/18/21 13:12	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.80**	mg/kg	0.024	0.010	1	11/12/21 15:07	11/21/21 10:55	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**23.0**	%	0.10	0.10	1		11/16/21 13:37		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Sample: BPSOU-UR05SS03-110421-2 **Lab ID: 10587273006** Collected: 11/04/21 09:40 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**145**	mg/kg	2.1	0.32	2	11/12/21 14:18	11/18/21 13:14	7440-38-2	
Cadmium	**5.3**	mg/kg	0.31	0.070	2	11/12/21 14:18	11/18/21 13:14	7440-43-9	
Copper	**49500**	mg/kg	25.8	3.8	50	11/12/21 14:18	11/18/21 13:45	7440-50-8	
Lead	**1190**	mg/kg	1.0	0.21	2	11/12/21 14:18	11/18/21 13:14	7439-92-1	
Zinc	**1840**	mg/kg	4.1	0.46	2	11/12/21 14:18	11/18/21 13:14	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.45**	mg/kg	0.020	0.0088	1	11/12/21 15:07	11/21/21 10:57	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**7.8**	%	0.10	0.10	1		11/16/21 13:37		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Sample: BPSOU-UR05SS03-110421-3 **Lab ID: 10587273007** Collected: 11/04/21 09:35 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**117**	mg/kg	2.3	0.34	2	11/12/21 14:18	11/18/21 13:15	7440-38-2	
Cadmium	**4.0**	mg/kg	0.34	0.077	2	11/12/21 14:18	11/18/21 13:15	7440-43-9	
Copper	**426**	mg/kg	1.1	0.16	2	11/12/21 14:18	11/18/21 13:15	7440-50-8	
Lead	**944**	mg/kg	1.1	0.23	2	11/12/21 14:18	11/18/21 13:15	7439-92-1	
Zinc	**1630**	mg/kg	4.5	0.50	2	11/12/21 14:18	11/18/21 13:15	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.65**	mg/kg	0.023	0.010	1	11/12/21 15:07	11/21/21 11:02	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**17.0**	%	0.10	0.10	1		11/16/21 13:38		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Sample: BPSOU-UR05SS04-110421-1 **Lab ID: 10587273008** Collected: 11/04/21 09:10 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**37.9**	mg/kg	2.0	0.31	2	11/12/21 14:18	11/18/21 13:17	7440-38-2	
Cadmium	**1.6**	mg/kg	0.30	0.069	2	11/12/21 14:18	11/18/21 13:17	7440-43-9	
Copper	**248**	mg/kg	1.0	0.15	2	11/12/21 14:18	11/18/21 13:17	7440-50-8	
Lead	**216**	mg/kg	1.0	0.21	2	11/12/21 14:18	11/18/21 13:17	7439-92-1	
Zinc	**506**	mg/kg	4.0	0.45	2	11/12/21 14:18	11/18/21 13:17	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.15**	mg/kg	0.019	0.0082	1	11/12/21 15:07	11/21/21 11:04	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**4.0**	%	0.10	0.10	1		11/16/21 13:38		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Sample: BPSOU-UR05SS04-110421-2 **Lab ID: 10587273009** Collected: 11/04/21 09:05 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**35.5**	mg/kg	2.3	0.35	2	11/12/21 14:18	11/18/21 13:19	7440-38-2	
Cadmium	**1.6**	mg/kg	0.34	0.078	2	11/12/21 14:18	11/18/21 13:19	7440-43-9	
Copper	**250**	mg/kg	1.1	0.17	2	11/12/21 14:18	11/18/21 13:19	7440-50-8	
Lead	**571**	mg/kg	1.1	0.24	2	11/12/21 14:18	11/18/21 13:19	7439-92-1	
Zinc	**646**	mg/kg	4.6	0.51	2	11/12/21 14:18	11/18/21 13:19	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.16**	mg/kg	0.022	0.0097	1	11/12/21 15:07	11/21/21 11:05	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**15.9**	%	0.10	0.10	1		11/16/21 13:38		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Sample: BPSOU-UR05SS04-110421-3 **Lab ID: 10587273010** Collected: 11/04/21 09:00 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**47.3**	mg/kg	2.2	0.33	2	11/12/21 14:18	11/18/21 13:20	7440-38-2	
Cadmium	**3.3**	mg/kg	0.32	0.074	2	11/12/21 14:18	11/18/21 13:20	7440-43-9	
Copper	**238**	mg/kg	1.1	0.16	2	11/12/21 14:18	11/18/21 13:20	7440-50-8	
Lead	**812**	mg/kg	1.1	0.22	2	11/12/21 14:18	11/18/21 13:20	7439-92-1	
Zinc	**1180**	mg/kg	4.3	0.48	2	11/12/21 14:18	11/18/21 13:20	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.26**	mg/kg	0.020	0.0088	1	11/12/21 15:07	11/21/21 11:07	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**10**	%	0.10	0.10	1		11/16/21 13:38		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Sample: BPSOU-UR05SS05-110421-1 **Lab ID: 10587273011** Collected: 11/04/21 10:10 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**12.2**	mg/kg	2.0	0.31	2	11/12/21 14:18	11/18/21 13:22	7440-38-2	
Cadmium	**0.68**	mg/kg	0.30	0.069	2	11/12/21 14:18	11/18/21 13:22	7440-43-9	
Copper	**214**	mg/kg	1.0	0.15	2	11/12/21 14:18	11/18/21 13:22	7440-50-8	
Lead	**43.2**	mg/kg	1.0	0.21	2	11/12/21 14:18	11/18/21 13:22	7439-92-1	
Zinc	**206**	mg/kg	4.0	0.45	2	11/12/21 14:18	11/18/21 13:22	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.029**	mg/kg	0.019	0.0081	1	11/12/21 15:07	11/21/21 11:08	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**5.9**	%	0.10	0.10	1		11/16/21 13:38		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Sample: BPSOU-UR05SS05-110421-2 **Lab ID: 10587273012** Collected: 11/04/21 10:05 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**9.3**	mg/kg	0.99	0.15	1	11/12/21 14:18	11/18/21 13:41	7440-38-2	
Cadmium	**0.27**	mg/kg	0.15	0.034	1	11/12/21 14:18	11/18/21 13:41	7440-43-9	
Copper	**151**	mg/kg	0.50	0.072	1	11/12/21 14:18	11/18/21 13:41	7440-50-8	
Lead	**26.6**	mg/kg	0.99	0.20	2	11/12/21 14:18	11/18/21 13:27	7439-92-1	
Zinc	**58.3**	mg/kg	2.0	0.22	1	11/12/21 14:18	11/18/21 13:41	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.038**	mg/kg	0.019	0.0082	1	11/12/21 15:07	11/21/21 11:10	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**3.9**	%	0.10	0.10	1		11/16/21 13:39		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Sample: BPSOU-UR05SS05-110421-3 **Lab ID: 10587273013** Collected: 11/04/21 10:00 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**19.9**	mg/kg	2.0	0.30	2	11/12/21 14:18	11/18/21 13:29	7440-38-2	
Cadmium	**0.32**	mg/kg	0.30	0.067	2	11/12/21 14:18	11/18/21 13:29	7440-43-9	
Copper	**146**	mg/kg	0.99	0.14	2	11/12/21 14:18	11/18/21 13:29	7440-50-8	
Lead	**28.3**	mg/kg	0.99	0.20	2	11/12/21 14:18	11/18/21 13:29	7439-92-1	
Zinc	**85.0**	mg/kg	3.9	0.44	2	11/12/21 14:18	11/18/21 13:29	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.068**	mg/kg	0.019	0.0084	1	11/12/21 15:07	11/21/21 11:12	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**3.5**	%	0.10	0.10	1		11/16/21 13:39		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Sample: BPSOU-UR01SS07-110321-3 **Lab ID: 10587273014** Collected: 11/03/21 10:35 Received: 11/11/21 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**2.3**	mg/kg	1.0	0.15	1	11/12/21 14:18	11/18/21 13:43	7440-38-2	
Cadmium	**0.093J**	mg/kg	0.15	0.034	1	11/12/21 14:18	11/18/21 13:43	7440-43-9	
Copper	**25.9**	mg/kg	0.51	0.074	1	11/12/21 14:18	11/18/21 13:43	7440-50-8	
Lead	**4.3**	mg/kg	1.0	0.21	2	11/12/21 14:18	11/18/21 13:33	7439-92-1	
Zinc	**38.6**	mg/kg	2.0	0.23	1	11/12/21 14:18	11/18/21 13:43	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**<0.0083**	mg/kg	0.019	0.0083	1	11/12/21 15:07	11/21/21 11:13	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**7.6**	%	0.10	0.10	1		11/16/21 13:39		N2

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

QC Batch: 783306
QC Batch Method: EPA 7471B
Analysis Method: EPA 7471B
Analysis Description: 7471B Mercury Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10587273001

METHOD BLANK: 4170180 Matrix: Solid
Associated Lab Samples: 10587273001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	<0.0079	0.018	0.0079	11/21/21 11:20	

LABORATORY CONTROL SAMPLE: 4170181

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.47	0.48	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4170182 4170183

Parameter	Units	10587272001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	<0.010	0.61	0.58	0.49	0.45	78	76	80-120	8	20	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

QC Batch: 783307 — Analysis Method: EPA 7471B
QC Batch Method: EPA 7471B — Analysis Description: 7471B Mercury Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10587273002, 10587273003, 10587273004, 10587273005, 10587273006, 10587273007, 10587273008, 10587273009, 10587273010, 10587273011, 10587273012, 10587273013, 10587273014

METHOD BLANK: 4170184 — Matrix: Solid
Associated Lab Samples: 10587273002, 10587273003, 10587273004, 10587273005, 10587273006, 10587273007, 10587273008, 10587273009, 10587273010, 10587273011, 10587273012, 10587273013, 10587273014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	<0.0081	0.019	0.0081	11/21/21 10:44	

LABORATORY CONTROL SAMPLE: 4170185

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.47	0.48	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4170186 4170187

Parameter	Units	10587273002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.20	0.51	0.5	0.70	0.70	99	101	80-120	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

QC Batch: 783304
QC Batch Method: EPA 3050B
Analysis Method: EPA 6010D
Analysis Description: 6010D Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10587273001

METHOD BLANK: 4170172 Matrix: Solid
Associated Lab Samples: 10587273001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/kg	<0.15	0.97	0.15	11/17/21 12:34	
Cadmium	mg/kg	<0.033	0.15	0.033	11/17/21 12:34	
Copper	mg/kg	<0.071	0.49	0.071	11/17/21 12:34	
Lead	mg/kg	<0.10	0.49	0.10	11/17/21 12:34	
Zinc	mg/kg	<0.22	1.9	0.22	11/17/21 12:34	

LABORATORY CONTROL SAMPLE: 4170173

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	46.7	42.8	92	80-120	
Cadmium	mg/kg	46.7	46.4	99	80-120	
Copper	mg/kg	46.7	45.2	97	80-120	
Lead	mg/kg	46.7	45.1	97	80-120	
Zinc	mg/kg	46.7	45.4	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4170174 4170175

Parameter	Units	10587272001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	3.7	65.2	64	54.5	53.2	78	77	75-125	2	20	
Cadmium	mg/kg	0.23	65.2	64	53.5	52.4	82	82	75-125	2	20	
Copper	mg/kg	68.6	65.2	64	123	122	84	83	75-125	1	20	
Lead	mg/kg	13.8	65.2	64	71.8	74.0	89	94	75-125	3	20	
Zinc	mg/kg	71.7	65.2	64	123	116	79	69	75-125	6	20	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

QC Batch: 783305
QC Batch Method: EPA 3050B
Analysis Method: EPA 6010D
Analysis Description: 6010D Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10587273002, 10587273003, 10587273004, 10587273005, 10587273006, 10587273007, 10587273008, 10587273009, 10587273010, 10587273011, 10587273012, 10587273013, 10587273014

METHOD BLANK: 4170176 Matrix: Solid
Associated Lab Samples: 10587273002, 10587273003, 10587273004, 10587273005, 10587273006, 10587273007, 10587273008, 10587273009, 10587273010, 10587273011, 10587273012, 10587273013, 10587273014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/kg	<0.15	0.96	0.15	11/18/21 12:53	
Cadmium	mg/kg	<0.033	0.14	0.033	11/18/21 12:53	
Copper	mg/kg	<0.070	0.48	0.070	11/18/21 12:53	
Lead	mg/kg	<0.099	0.48	0.099	11/18/21 12:53	
Zinc	mg/kg	<0.21	1.9	0.21	11/18/21 12:53	

LABORATORY CONTROL SAMPLE: 4170177

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	48.5	46.5	96	80-120	
Cadmium	mg/kg	48.5	49.5	102	80-120	
Copper	mg/kg	48.5	48.0	99	80-120	
Lead	mg/kg	48.5	48.5	100	80-120	
Zinc	mg/kg	48.5	49.0	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4170178 4170179

Parameter	Units	10587273002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	203	49.7	50.7	227	237	49	67	75-125	4	20	P6
Cadmium	mg/kg	4.6	49.7	50.7	50.7	50.5	93	91	75-125	0	20	
Copper	mg/kg	519	49.7	50.7	483	461	-72	-115	75-125	5	20	P6
Lead	mg/kg	630	49.7	50.7	732	694	204	126	75-125	5	20	P6
Zinc	mg/kg	1720	49.7	50.7	2110	1880	776	318	75-125	11	20	P6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

QC Batch: 783613
QC Batch Method: ASTM D2974
Analysis Method: ASTM D2974
Analysis Description: Dry Weight / %M by ASTM D2974
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10587273001, 10587273002, 10587273003, 10587273004, 10587273005, 10587273006, 10587273007, 10587273008, 10587273009, 10587273010, 10587273011, 10587273012, 10587273013, 10587273014

SAMPLE DUPLICATE: 4172321

Parameter	Units	10587273001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	13.4	13.7	2	30	N2

SAMPLE DUPLICATE: 4172322

Parameter	Units	10587273011 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	5.9	5.7	4	30	N2

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

WORKORDER QUALIFIERS

WO: 10587273

[1]	The samples were received outside of required temperature range. Analysis was completed upon client approval.

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
N2	The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BPSOU Unreclaimed Sampling
Pace Project No.: 10587273

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10587273001	**BPSOU-UR05SS02-110421-1**	EPA 3050B	783304	EPA 6010D	783590
10587273002	**BPSOU-UR05SS02-110421-1-FD**	EPA 3050B	783305	EPA 6010D	783589
10587273003	**BPSOU-UR05SS02-110421-2**	EPA 3050B	783305	EPA 6010D	783589
10587273004	**BPSOU-UR05SS02-110421-3**	EPA 3050B	783305	EPA 6010D	783589
10587273005	**BPSOU-UR05SS03-110421-1**	EPA 3050B	783305	EPA 6010D	783589
10587273006	**BPSOU-UR05SS03-110421-2**	EPA 3050B	783305	EPA 6010D	783589
10587273007	**BPSOU-UR05SS03-110421-3**	EPA 3050B	783305	EPA 6010D	783589
10587273008	**BPSOU-UR05SS04-110421-1**	EPA 3050B	783305	EPA 6010D	783589
10587273009	**BPSOU-UR05SS04-110421-2**	EPA 3050B	783305	EPA 6010D	783589
10587273010	**BPSOU-UR05SS04-110421-3**	EPA 3050B	783305	EPA 6010D	783589
10587273011	**BPSOU-UR05SS05-110421-1**	EPA 3050B	783305	EPA 6010D	783589
10587273012	**BPSOU-UR05SS05-110421-2**	EPA 3050B	783305	EPA 6010D	783589
10587273013	**BPSOU-UR05SS05-110421-3**	EPA 3050B	783305	EPA 6010D	783589
10587273014	**BPSOU-UR01SS07-110321-3**	EPA 3050B	783305	EPA 6010D	783589
10587273001	**BPSOU-UR05SS02-110421-1**	EPA 7471B	783306	EPA 7471B	783726
10587273002	**BPSOU-UR05SS02-110421-1-FD**	EPA 7471B	783307	EPA 7471B	783729
10587273003	**BPSOU-UR05SS02-110421-2**	EPA 7471B	783307	EPA 7471B	783729
10587273004	**BPSOU-UR05SS02-110421-3**	EPA 7471B	783307	EPA 7471B	783729
10587273005	**BPSOU-UR05SS03-110421-1**	EPA 7471B	783307	EPA 7471B	783729
10587273006	**BPSOU-UR05SS03-110421-2**	EPA 7471B	783307	EPA 7471B	783729
10587273007	**BPSOU-UR05SS03-110421-3**	EPA 7471B	783307	EPA 7471B	783729
10587273008	**BPSOU-UR05SS04-110421-1**	EPA 7471B	783307	EPA 7471B	783729
10587273009	**BPSOU-UR05SS04-110421-2**	EPA 7471B	783307	EPA 7471B	783729
10587273010	**BPSOU-UR05SS04-110421-3**	EPA 7471B	783307	EPA 7471B	783729
10587273011	**BPSOU-UR05SS05-110421-1**	EPA 7471B	783307	EPA 7471B	783729
10587273012	**BPSOU-UR05SS05-110421-2**	EPA 7471B	783307	EPA 7471B	783729
10587273013	**BPSOU-UR05SS05-110421-3**	EPA 7471B	783307	EPA 7471B	783729
10587273014	**BPSOU-UR01SS07-110321-3**	EPA 7471B	783307	EPA 7471B	783729
10587273001	**BPSOU-UR05SS02-110421-1**	ASTM D2974	783613		
10587273002	**BPSOU-UR05SS02-110421-1-FD**	ASTM D2974	783613		
10587273003	**BPSOU-UR05SS02-110421-2**	ASTM D2974	783613		
10587273004	**BPSOU-UR05SS02-110421-3**	ASTM D2974	783613		
10587273005	**BPSOU-UR05SS03-110421-1**	ASTM D2974	783613		
10587273006	**BPSOU-UR05SS03-110421-2**	ASTM D2974	783613		
10587273007	**BPSOU-UR05SS03-110421-3**	ASTM D2974	783613		
10587273008	**BPSOU-UR05SS04-110421-1**	ASTM D2974	783613		
10587273009	**BPSOU-UR05SS04-110421-2**	ASTM D2974	783613		
10587273010	**BPSOU-UR05SS04-110421-3**	ASTM D2974	783613		
10587273011	**BPSOU-UR05SS05-110421-1**	ASTM D2974	783613		
10587273012	**BPSOU-UR05SS05-110421-2**	ASTM D2974	783613		
10587273013	**BPSOU-UR05SS05-110421-3**	ASTM D2974	783613		
10587273014	**BPSOU-UR01SS07-110321-3**	ASTM D2974	783613		

Laboratory Management Program (LaMP) Chain of Custody Record
Soil, Sediment and Groundwater Samples

BP Site Node Path: _____ Req Due Date (mm/dd/yy): 11/22/21 Rush TAT Yes 14 day No _____

BP/RM Facility No: _____ Lab Work Order Number: _____

Lab Name: Pace Analytical	BP/ARC Facility Address:	Consultant/Contractor:	Pioneer Technical Services
Lab Address: 1700 Elm Street SE, Minneapolis, MN 55414	City, State, ZIP Code:	Consultant/Contractor Project No:	BPSOU Unreclaimed Sampling
Lab PM: Jennifer Anderson	Lead Regulatory Agency:	Address:	1101 S. Montana St.
Lab Phone: 612-607-6436	California Global ID No.:	Consultant/Contractor PM:	Scott Sampson
Lab Shipping Accnt:	Enfos Proposal No:	Phone: 406-697-0946 Email:	ssampson@pioneer-technical.com
Lab Bottle Order No:	Accounting Mode: Provision ____ OOC-BU ____ OOC-RM ____	Send/Submit EDD to:	Scott Sampson
Other Info:	Stage Activity	Invoice To:	BP-RM _____ BP-Other _____
BP/RM PM: Mike Mc Anulty			
PM Phone: 406-723-1822			
PM Email: mcanumc@bp.com			

Requested Analyses

Report Type & QC Level

Limited (Standard) Package _

Limited Plus Package _

Full Package Level 2

WO#: 10587273

10587273

Lab No.	Unique Sample ID, must follow format of SAMPLENAMEYYYYMMDD Examples: MW01_20190101; BH01_3-5_20190101	Time	Depth Unit	Grab (G) or Composite (C)	Total Number of Containers	Matrix	Analysis: Total Metals 6010 As, Cd, Cu, Pb, Zn	Analysis: 7471 Mercury	
	BPSOU-UR05SS02-110421-1	9:20	in	c	1	soil	x	x	001
	BPSOU-UR05SS02-110421-1-FD	9:25	in	c	1	soil	x	x	002
	BPSOU-UR05SS02-110421-2	9:15	in	c	1	soil	x	x	003
	BPSOU-UR05SS02-110421-3	9:10	in	c	1	soil	x	x	004
	BPSOU-UR05SS03-110421-1	9:45	in	c	1	soil	x	x	005
	BPSOU-UR05SS03-110421-2	9:40	in	c	1	soil	x	x	006
	BPSOU-UR05SS03-110421-3	9:35	in	c	1	soil	x	x	007

		Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Name:	Jesse Sims						
Sampler's Company:	Pioneer Technical Services	Jesse Sims/PTS	11/8/2021	1600	JD Pace	11/11/21	850
Ship Method: FedEx Overnight	Ship Date: 11/8/21						
Shipment Tracking No:	4278 9934 6428						

Special Instructions: *Maximum 14 day TAT

THIS LINE - LAB USE ONLY: Custody Seals In Place (Yes) / No | Temp Blank (Yes) / No | Cooler Temp on Receipt: 3.4 °F (C) | Trip Blank: Yes / (No) | MS/MSD Sample Submitted: Yes / (No)

BP LaMP Soil/H2O COC March 2019

Laboratory Management Program (LaMP) Chain of Custody Record
Soil, Sediment and Groundwater Samples

BP Site Node Path: _____ Req Due Date (mm/dd/yy): 11/22/21 Rush TAT Yes 14 day No _____

BP/RM Facility No: _____ Lab Work Order Number: _____

Lab Name: Pace Analytical	BP/ARC Facility Address:	Consultant/Contractor:	Pioneer Technical Services
Lab Address: 1700 Elm Street SE, Minneapolis, MN 55414	City, State, ZIP Code:	Consultant/Contractor Project No:	BPSOU Unreclaimed Sampling
Lab PM: Jennifer Anderson	Lead Regulatory Agency:	Address:	1101 S. Montana St.
Lab Phone: 612-607-6436	California Global ID No.:	Consultant/Contractor PM:	Scott Sampson
Lab Shipping Accnt:	Enfos Proposal No:	Phone: 406-697-0946 Email:	ssampson@pioneer-technical.com
Lab Bottle Order No:	Accounting Mode: Provision ____ OOC-BU ____ OOC-RM ____	Send/Submit EDD to:	Scott Sampson
Other Info:	Stage Activity	Invoice To:	BP-RM ____ BP-Other ____

BP/RM PM: Mike Mc Anulty

PM Phone: 406-723-1822

PM Email: mcanumc@bp.com

Requested Analyses

Report Type & QC Level

Limited (Standard) Package –

Limited Plus Package –

Full Package Level 2

Lab No.	Unique Sample ID, must follow format of SAMPLENAMEYYYYMMDD Examples: MW01_20190101; BH01_3-5_20190101	Time	Depth Unit	Grab (G) or Composite (C)	Total Number of Containers	Matrix	Analysis	Total Metals 6010 As, Cd, Cu, Pb, Zn	7471 Mercury	Filtered (Y/N)	Preservation	Comments
	BPSOU-UR05SS04-110421-1	9:10	in	c	1	soil		x	x			008
	BPSOU-UR05SS04-110421-2	9:05	in	c	1	soil		x	x			009
	BPSOU-UR05SS04-110421-3	9:00	in	c	1	soil		x	x			010
	BPSOU-UR05SS05-110421-1	10:10	in	c	1	soil		x	x			011
	BPSOU-UR05SS05-110421-2	10:05	in	c	1	soil		x	x			012
	BPSOU-UR05SS05-110421-3	10:00	in	c	1	soil		x	x			013
	BPSOU-UR01SS07-110321-3	10:35	in	c	1	soil		x	x			014

Sampler's Name: Jesse Sims	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Pioneer Technical Services	Jesse Sims/PTS	11/8/2021	1600	JD Pace	11/11/21	850
Ship Method: FedEx Overnight Ship Date: 11/8/21						
Shipment Tracking No: 4278 9934 6428						

Special Instructions: *Maximum 14 day TAT

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: 8.4 °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

BP LaMP Soil/H2O COC March 2019

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - ESI**	Document Revised: 12Aug2020 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0149 Rev.01**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt – ESI Tech Specs

Client Name: bp rm (Lamp)

Project #: **WO#: 10587273**

PM: JMA Due Date: 11/24/21

CLIENT: BP-PIONEER

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Pace ☐ SpeeDee ☐ Commercial

Tracking Number: 427899346128 **See Exceptions** ☐ **ENV-FRM-MIN4-0142**

Custody Seal on Cooler/Box Present? ☑ Yes ☐ No **Seals Intact?** ☑ Yes ☐ No **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Packing Material: ☑ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other: _____ **Temp Blank?** ☑ Yes ☐ No

Thermometer: ☐ T1(0461) ☐ T2(1336) ☑ T3(0459) ☐ T4(0254) ☐ T5(0489) **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 8.5 °C

Correction Factor: -0.1 **Cooler Temp Corrected w/temp blank:** 8.4 °C

Average Corrected Temp (no temp blank only): _____ °C ☐ **See Exceptions ENV-FRM-MIN4-0142** ☐ **1 Container**

USDA Regulated Soil: (☐ N/A, water sample/Other: _____)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

Date/Initials of Person Examining Contents: JA 11-11-21

				COMMENTS:
Chain of Custody Present and Filled Out?	☑ Yes	☐ No		1.
Chain of Custody Relinquished?	☑ Yes	☐ No		2.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	3.
Samples Arrived within Hold Time?	☑ Yes	☐ No		4.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E coli ☐ BOD/cBOD ☐ Hex Chrome ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐
Rush Turn Around Time Requested?	☑ Yes	☐ No		6.
Sufficient Sample Volume?	☑ Yes	☐ No		
Triple Volume Provided for MS/MSD (if more than 10 samples)?	☐ Yes	☑ No	☐ N/A	7.
Correct Containers Used?	☑ Yes	☐ No		8.
-Pace Containers Used?	☐ Yes	☑ No		
Containers Intact?	☑ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC	☑ Yes	☐ No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ **ENV-FRM-MIN4-0142**
Matrix: ☐ Water ☑ Soil ☐ Oil ☐ Other _____				
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☑ N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐ Yes	☐ No	☑ N/A	☐ NaOH ☐ HNO_3 ☐ H_2SO_4 ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS *If adding preservative to a container it must be added to associated field and equipment blanks (verify with PM first)	☐ Yes	☐ No	☑ N/A	Positive for Res. Chlorine? ☐ Yes ☐ No **pH Paper Lot#** **See Exception** ☐ **ENV-FRM-MIN4-0142**
				Res. Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO contaners?	☐ Yes	☐ No	☑ N/A	13. **See Exception** ☐ **ENV-FRM-MIN4-0140**
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☐ No	☑ N/A	
3 Trip Blanks Present?	☐ Yes	☐ No	☑ N/A	14.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	Pace Trip Blank Lot # (if purchased): _____

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins 1500

Opened Time: 0850 Temp: 8.3	Corrected Temp: 8.4	
Time: KHL 11.11.21 Put in cooler		
Time: 910-1515 Temp: 8.3	Corrected Temp: 8.4	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution: Notified of temperature.

Project Manager Review: _____ **Date:** 11/15/2021

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Labeled by: SDD

From: Jennifer Anderson
To: Scott Sampson
Cc: Laura Moon
Subject: RE: Temperature - BPSOU Unreclaimed Sampling Pace Projects 10587272 / 10587273
Date: Friday, November 12, 2021 4:14:00 PM
Attachments: image001.png
image002.png

Sounds good, thank you Scott! We will proceed with the analyses.

Jennifer Anderson, PMP
Project Manager | Pace Environmental Sciences
Direct 612.607.6436 | Main 612.607.6400

Pace Analytical Services will be closed Thursday, November 25th and Friday, November 26th for the Thanksgiving Holiday. Please coordinate with your project manager to schedule any rush or short hold analyses around these dates.

From: Scott Sampson <ssampson@Pioneer-technical.com>
Sent: Friday, November 12, 2021 11:18 AM
To: Jennifer Anderson <Jennifer.Anderson@pacelabs.com>
Cc: Laura Moon <lmoon@pioneer-technical.com>
Subject: RE: Temperature - BPSOU Unreclaimed Sampling Pace Projects 10587272 / 10587273

Jennifer,

Thank you for the notification. FedEx is making things challenging...

Please proceed with analysis of samples on both COCs.

Thanks,
Scott

From: Jennifer Anderson <Jennifer.Anderson@pacelabs.com>
Sent: Friday, November 12, 2021 6:41 AM
To: Scott Sampson <ssampson@Pioneer-technical.com>
Subject: Temperature - BPSOU Unreclaimed Sampling Pace Projects 10587272 / 10587273

Good Morning Scott,

We received the samples for the attached COCs yesterday and it was noted that the samples were over 6 degrees Celsius. The temperature was noted to be 8.4 degrees Celsius. The 6010 metals are not temperature sensitive, but mercury in soils is temperature sensitive.

We can plan to proceed and qualify accordingly, please let me know if it would be preferred to not

proceed with either of these.

Thank you,
Jennifer

Jennifer Anderson, PMP
Project Manager | Pace Environmental Sciences
1700 Elm Street SE Suite 200, Minneapolis, MN 55414
Direct 612.607.6436 | Main 612.607.6400

Pace Analytical Services will be closed Thursday, November 25th and Friday, November 26th for the Thanksgiving Holiday. Please coordinate with your project manager to schedule any rush or short hold analyses around these dates.

Please let your Project Manager know if your project is related to a permit or if your permit has recently been updated.

Attachment D
Electronic Data Deliverable File

Included separately

Appendix B
Site Photographs

Atlantic Richfield Company

PhotoNumber: UR01-1	Photographer:
Date: 11/02/2021 09:00	Photo Direction: South East
Description: Master utilities locate ok	
Project: BPSOU Unreclaimed and Insufficiently Reclaimed Sites 2021	

Atlantic Richfield Company

PhotoNumber: UR01-2	Photographer:
Date: 11/02/2021	Photo Direction: South East
Description: General facing west	
Project: BPSOU Unreclaimed and Insufficiently Reclaimed Sites 2021	

Atlantic Richfield Company

PhotoNumber: UR01-4	Photographer:
Date: 11/02/2021	Photo Direction: North West
Description: Gravel and manure dumps.	
Project: BPSOU Unreclaimed and Insufficiently Reclaimed Sites 2021	

Atlantic Richfield Company

PhotoNumber: UR01-5	Photographer:
Date: 11/02/2021	Photo Direction: North West
Description: General	
Project: BPSOU Unreclaimed and Insufficiently Reclaimed Sites 2021	

Atlantic Richfield Company

PhotoNumber: UR01-6	Photographer:
Date: 11/02/2021	Photo Direction: North East
Description: Large dump, looks of borrow or cover soil.	
Project: BPSOU Unreclaimed and Insufficiently Reclaimed Sites 2021	

Atlantic Richfield Company

PhotoNumber: UR01-7	Photographer:
Date: 11/02/2021	Photo Direction: South West
Description: General, SW end of site.	
Project: BPSOU Unreclaimed and Insufficiently Reclaimed Sites 2021	

Atlantic Richfield Company

PhotoNumber: UR01-8	Photographer:
Date: 11/02/2021	Photo Direction: South West
Description: General northwest	
Project: BPSOU Unreclaimed and Insufficiently Reclaimed Sites 2021	

Atlantic Richfield Company

PhotoNumber: UR01-8	Photographer: OP01, dump is light in color. Different material than surrounding dumps.
Date: 11/03/2021	Photo Direction: South West
Description:	
Project: BPSOU Unreclaimed and Insufficiently Reclaimed Sites 2021	