Summer 6-16-2022

Butte Priority Soils Operable Unit (BPSOU) Draft Final Insufficiently Reclaimed Sites – Field Sampling Plan (FSP) BRES No. 38 – Sister Dump.

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June 16, 2022

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Re: Butte Priority Soils Operable Unit (BPSOU) Draft Final Insufficiently Reclaimed Sites – Field Sampling Plan (FSP) BRES No. 38 – Sister Dump.

Dear Agency Representatives:

I am writing to you on behalf of Atlantic Richfield Company to submit the Butte Priority Soils Operable Unit (BPSOU) Draft Final Insufficiently Reclaimed (IR) Sites - Field Sampling and Investigation Plan (FSP) Butte Remediation Evaluation System (BRES) No. 38 – Sister Dump.

As described in Appendix D, Attachment C to the 2020 BPSOU Consent Decree (CD) (available at https://www.co.silverbow.mt.us/2161/ButtePriority-Soils-Operable-Unit-Conse), sites listed as IR Solid Media Sites within BPSOU were reclaimed prior to the establishment of the Butte Hill Revegetation Specifications (BHRS), which is Appendix B of Appendix E to the U.S. Environmental Protection Agency (EPA) 2006 Record of Decision (ROD) contained in the CD. Since additional reclamation work may be required to bring the sites into compliance with the BHRS, the sites will be evaluated to assess past actions and to identify any site-specific conditions that fail to meet the BHRS.

The site evaluation will include a review of available previous BRES field evaluations and site construction completion reports along with on-site evaluation and sampling. The site evaluation will include sampling within the existing site boundary performed according to the Atlantic Richfield Company *2022 Final Insufficiently Reclaimed Sites Quality Assurance Project Plan (QAPP)* (referred to as IR Sites QAPP). The IR Sites QAPP is available at the following link:

Link will be provided upon approval of the 2022 IR QAPP, which was submitted to the Agencies on May 20, 2022.[1].

[1] Please note the link provided is valid for one year from the date of this submittal.

Field sampling within the existing boundary will be performed to determine whether contaminants are present, whether growth media is adequate, and whether there are previously unidentified sources contributing to site deficiencies.

Additional sampling performed in adjacent areas outside of the existing site boundary to characterize gap zones where site characterization may be unknown or incomplete will be conducted according to the Atlantic Richfield Company *Final Unreclaimed Sites Quality Assurance Project Plan (QAPP)* (referred to as Unreclaimed Sites QAPP) which also is a component of the BPSOU Solid Media Management Project Plan and is available at the following link:

https://pioneertechnicalservices.sharepoint.com/:f:/s/submitted/Ev1dhUeMuUdLjU8tnuV5RioBvJZRYc2HpgEjM9KzT-PpjQ.[2]

Sample results in the areas outside of the existing site boundary will be evaluated to determine if contaminants are present beyond the site boundary at concentrations exceeding action levels listed in Table 1 or Table 2 in the Unreclaimed Sites QAPP. Final sampling data will be used to assist in determining the final site declaration.

This FSP provides details related to the field evaluation of the IR Site BRES No. 38 – Sister Dump. Proposed soil sampling stations and areas of known deficiencies are shown on Figure 1.

The site evaluation is anticipated to be completed in summer 2022. A site summary and declaration will be prepared to present all available site data and describe which, if any, BHRS criteria are not met. The site will be evaluated following the Recreational Land Use Waste Identification and Action Level Criteria provided in the IR Sites and Unreclaimed Sites QAPPs. A remedial action work plan (RAWP) describing actions that will be implemented at the site will be provided for Agency review and approval.

A list of FSPs, provided below, will be updated to record the status and progress related to FSP submittals.

Submittal	Site	Submittal Date	Approval Date
1	BRES No. 104 – Colorado Dump Shaft	9/29/2021	11/5/2021
1R	BRES No. 104 – Colorado Dump Shaft, Final Revised	12/2/2021	12/6/2021
2	BRES No. 154 – Clark Mill Tailings NE	12/1/2021	12/6/2021
3	BRES No. 30 – Atlantic-1	1/12/2022	2/22/2022
4	BRES No. 16 – Curry	1/12/2022	2/22/2022
5	BRES No. 8 – Belle of Butte	3/11/2022	
6	BRES No. 38 – Sister Dump	6/16/2022	
7	BRES No. 37 – Josephine Shaft		
8	BRES No. 158 – Waste Rock Dump		

[2] Please note the link provided is valid for one year from the date of this submittal.

The crosswalk list provided below references where pertinent field sample collection and documentation elements are discussed.

	Reference Location		
Element	**FSP**	**IR Sites QAPP**	**Unreclaimed Sites QAPP**
Title page and approval authority.		Page i	Page i
Introduction and appropriate Agency-approved QAPP reference.	X		
Goals and objectives of sampling.		Section 2.4, Section 3.2	Section 2.4, Section 3.2
Proposed schedule for field work.	X		
Site figure including sampling locations, number and depth of samples to be collected, and sample field identification (ID).	X	Section 3.2.1	Section 3.2.1
Field activity methods and procedures, standard operating procedures.		Section 3.2, Table 4	Section 3.2, Table 4
Sample labeling and shipping.		Section3.2.5, Appendix C	Section3.2.5, Appendix C
Sample analysis specifying X-ray fluorescence vs. laboratory analysis and laboratory name.		Section 3.3	Section 3.3
Figure showing the site and/or area represented by a sample, sample ID, and aliquot locations for composite samples.	X		

Background

The Sister Dump (BRES No. 38) is approximately 3.13 acres located on the south side of North Main Street between O'Neill Street and the Josephine Shaft site. Reclamation by ARCO in 1990 and 1991 consisted of removing all waste to Disposal Area 2 (Moose Dump Area). The area was recontoured, capped, and revegetated. Lime rock from the Anaconda Quarry was applied at a rate of 350 tons per acre (tons/acre). Cover material from the Minnie Irvine borrow area was applied to a depth of 18 inches. A granular 11-52-0 (% nitrogen - % phosphorous - % potassium) fertilizer mix was broadcast at a rate of 300 pounds per acre (lbs/acre). Following the application of the fertilizer, the area was chisel plowed. A double disc drill seeder was used to plant the Walkerville EPA seed mixture at a rate of 20 lbs/acre. A straw spreader was used to spread straw at a rate of 2 tons/acre.

Additional site reclamation completed in 1998 included applying limestone, fertilizing, mulching, and seeding. The site was part of the ARCO 1997 *Response Action Work Plan Addendum (RAWPA) for Unreclaimed Areas*[3] but is located on a previously reclaimed source area. Reclamation work completed from April 7, 1998, to June 29, 1998, encompassed an area totaling 1.2 acres.

[3] ARCO, 1997. *Response Action Work Plan Addendum (RAWPA) for Unreclaimed Areas.* 1997.

Reclamation was performed in two separate areas to the west and east of the site. No grading to the site was required. An unnamed road on the north border was regraded to reduce storm water run-on to the site. The road was graded to direct storm water to an existing drain on the north side of the road.

Approximately 2 inches of limestone were applied at the rate of 350 tons/acre to the eastern part of the site due to low pH. After the limestone placement, 18 inches of cover soil, consisting of 12 inches of Minnie Irvine cover soil and 6 inches of Butte-Silver Bow (BSB) Landfill topsoil, were placed. Reclamation completed on the western area included 18 inches of cover soil, consisting of 12 inches of Minnie Irvine cover soil and 6 inches of BSB Landfill topsoil over the poorly vegetated area.

Manure, sourced from Dillon, Montana, was spread over the cover soil at a rate of 30 dry tons/acre. Fertilizer was applied on June 8, 1998, at a rate of 60 nitrogen (N), 80 potassium oxide (K_2O), and 150 phosphorus pentoxide (P_2O_5) lbs/acre. The manure and fertilizer were chisel plowed into the top 6 inches of cover soil. Straw mulch was spread at a rate of 2 tons/acre and crimped into the cover soil on July 27, 1998. The site was drill seeded on October 21, 1998, with 19 pounds per acre of primary seed mixture.

Previous Evaluation Findings

The site was evaluated in 2019 during the recurring BRES site evaluation process. A review of previous site evaluations will be incorporated into the current site evaluation, sampling, and future remedial action. A preliminary review of the evaluation indicates potential issues with weeds, exposed waste, sites edges, and barren areas.

Previous Sampling Efforts

Data obtained from the Geocortex web-based database at https://eis2.woodardcurran.com/Html5Viewer/index.html?viewer=BPButte.BPSOU contains the records for previous soil samples collected near BRES No. 38 – Sister Dump. The approximate sample stations are included on Figure 1 with results provided in Table 1 below. Sample results highlighted below exceed ROD Solid Media soil screening criteria. The BPSOU action levels are listed in Table 1 and Table 2 of the IR Sites QAPP, Section 2.4.

Table 1: Previous Sampling
Results from BPSOU Soil Sampling

COCs	Sample ID: **DR-009**	Sample ID: **DR-011**	Sample ID: **FSUA-10**	Sample ID: **TB-SO-10**
Arsenic	65 mg/kg	138 mg/kg	35 mg/kg	124 mg/kg
Cadmium	16 mg/kg	7 mg/kg	0 mg/kg	7 mg/kg
Copper	386 mg/kg	302 mg/kg	495 mg/kg	800 mg/kg
Lead	2,310 mg/kg	1,130 mg/kg	3,220 mg/kg	1,070 mg/kg
Zinc	3,050 mg/kg	2,370 mg/kg	1,630 mg/kg	1,900 mg/kg
pH	4.64 S.U.	4.42 S.U.	3.78 S.U.	4.6 S.U.

COC: Contaminant of concern. mg/kg: milligrams per kilogram. S.U.: standard unit.

Preliminary Site Evaluation

A preliminary site visit was conducted during development of this sampling plan to qualify current site conditions and identify areas of focus for additional evaluation. Site photographs were taken during the preliminary site evaluation to capture site conditions. The photographs are included in this section for reference. The site investigation found the site to have good vegetation establishment, large barren areas with surface staining, and an active gully with sediment deposition.

Photograph 1: Reclaimed by BSB in 2021.

Photograph 2: Left-Recent Remedial Action Effort in Proposed IR Sampling Boundary. Right-Good Vegetation within Original IR Boundary.

Remedial action was conducted by BSB within the IR proposed sampling boundary seen on Photograph 1 and Photograph 2. Multiple areas of erosion and bare areas were identified within the site boundary and proposed sampling area (Photograph 3, Photograph 4, Photograph 5, and Photograph 9). Slopes, shown on Photograph 4, will be evaluated to mitigate erosion. Evaluations will consider regrading, vegetating, or armoring requirements. A local biology/plant ecologist, or suitable Subject Matter Expert (SME), will be consulted to determine if a site-specific seed mix may be developed with remedial erosion controls to establish vegetation or if riprap armoring provides a more suitable long-term remedy.

Photograph 3: Area of Soil Deposition from Storm Water Inlet.

Photograph 3: Steep Eroding Slopes with Iron Staining.

Photograph 4: Edge of BSB Remedial Action and Large Gully.

Photograph 5: Site has Good Vegetation on the Western Portion.

Photograph 6: Large Barren Area on Northeast Corner of Site.

Photograph 7: Possible Historic Mine Exploration Pit.

Photograph 8: Barren Area Around Possible Excavation Pit.

Site Characterization Plan

Per the IR Sites QAPP, the site will be sampled at 2 depth intervals [(1) 0 to 6 inches and (2) 6 to 18 inches] to determine whether waste is present and/or confirm the depth of previous reclamation efforts. Additional samples obtained outside of the existing site boundary will be obtained from 3 depth intervals [(3) 0 to 2 inches, (4) 2 to 6 inches, and (5) 6 to 12 inches] per the Unreclaimed Sites QAPP sampling protocol. Figure 1 illustrates the proposed 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).

Results will be used to prepare the site declaration and prescribe site remedial improvements. The overall site will be sampled following procedures in the IR Sites QAPP using a systematic procedure to determine the spatial characterization of waste, parameters of previous reclamation, and extent of transient material. Sampling performed outside of the existing boundary will be used to determine if waste extends beyond the existing boundary at concentrations which exceed levels listed in Table 1 or Table 2 of the Unreclaimed Sites QAPP and will be used to assist in the determination of the final site declaration.

Existing site grading and drainages will be evaluated to determine storm water flow patterns and identify if additional storm water controls will help prevent sediment migration. The location and condition of existing storm water features will be field-verified and recorded to be used in corrective actions. Contributing sources of storm water upgradient and adjacent to the site will also be investigated.

Items identified below will be evaluated to determine whether they are adequate and to identify if additional remedial measures are necessary. The following provides the minimum potential site characterization items that will be considered. Additional items may be identified during the remedial design process.

- Evaluate plant species cover to BHRS seed mix specifications.
    - Coordinate and confirm plant species with biology/plant ecologist or related SME.
- Evaluate site storm water controls to mitigate run-on/runoff.
- Evaluate existing storm water controls designed for a 25-year, 24-hour, Soil Conservation Service Type I storm event.
- Identify remedial improvements to mitigate site erosion and vegetative areas to meet BHRS.
- Identify maintenance items for successful long-term operation.
- Evaluate steep slopes for regrading and eroding of possible mining waste.

Final remedial cap configuration (i.e., vegetative or engineered) will be coordinated with the landowner's end usage. A final RAWP will be provided for Agency review and approval.

Sampling Procedure

All soil sampling and characterization activities and procedures within the existing site boundary will follow the IR Sites QAPP. Samples will be obtained from the sample stations listed below. The IR Sites QAPP also describes the quality assurance/quality control policies and procedures that will be used during sample collection and analysis.

Sample Station	2 Depth Intervals (inches)
IR-38-SS01	(1) 0-6, (2) 6-18
IR-38-SS02	(1) 0-6, (2) 6-18
IR-38-SS03	(1) 0-6, (2) 6-18
IR-38-SS04	(1) 0-6, (2) 6-18
IR-38-SS05	(1) 0-6, (2) 6-18
IR-38-SS06	(1) 0-6, (2) 6-18
IR-38-SS07	(1) 0-6, (2) 6-18
IR-38-SS08	(1) 0-6, (2) 6-18
IR-38-SS09	(1) 0-6, (2) 6-18
IR-38-SS10	(1) 0-6, (2) 6-18
IR-38-SS11	(1) 0-6, (2) 6-18
IR-38-SS12	(1) 0-6, (2) 6-18
IR-38-SS13	(1) 0-6, (2) 6-18
IR-38-SS14	(1) 0-6, (2) 6-18
IR-38-SS15	(1) 0-6, (2) 6-18
IR-38-SS16	(1) 0-6, (2) 6-18
IR-38-SS17	(1) 0-6, (2) 6-18
IR-38-SS18	(1) 0-6, (2) 6-18
IR-38-SS19	(1) 0-6, (2) 6-18
IR-38-SS20	(1) 0-6, (2) 6-18
IR-38-SS21	(1) 0-6, (2) 6-18

All soil sampling and characterization activities beyond the existing site boundary at sample stations listed below will follow the Unreclaimed Sites QAPP.

Sample Station	3 Depth Intervals (inches)
IR-38-SS22	(3) 0-2, (4) 2-6, and (5) 6-12
IR-38-SS23	(3) 0-2, (4) 2-6, and (5) 6-12
IR-38-SS24	(3) 0-2, (4) 2-6, and (5) 6-12
IR-38-SS25	(3) 0-2, (4) 2-6, and (5) 6-12
IR-38-SS26	(3) 0-2, (4) 2-6, and (5) 6-12
IR-38-SS27	(3) 0-2, (4) 2-6, and (5) 6-12
IR-38-SS28	(3) 0-2, (4) 2-6, and (5) 6-12

This field work is anticipated to begin in summer of 2022, depending on site conditions.

Site Summary Report and Declaration

After the site evaluation and data collection activities have been completed, a summary report will be prepared and submitted to Agencies for review and approval. The report will include a summary of all available site sampling data and a site declaration specifying any deficient BHRS criteria.

If you have questions or comments, please do not hesitate to call me at (907) 355-3914.

Sincerely,

Mike McAnulty

Mike Mc Anulty
Liability Manager
Remediation Management Services Company
An affiliate of **Atlantic Richfield Company**

Attachments:

Figure 1 – Insufficiently Reclaimed Sites BRES No. 38 Sister Dump Proposed Sample Stations
Attachment 1 – Document Links

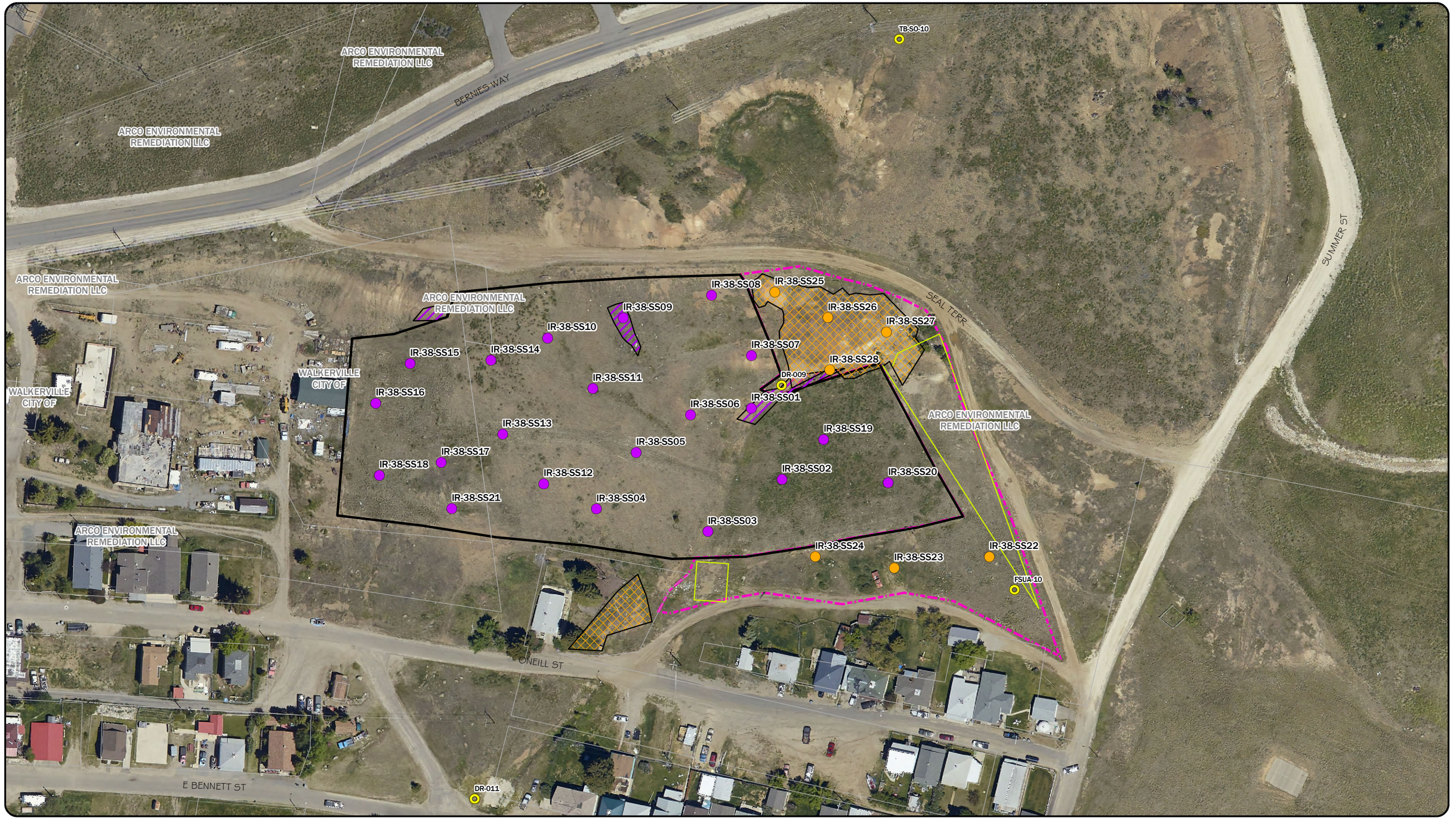
Cc: Patricia Gallery / Atlantic Richfield - email
Chris Greco / Atlantic Richfield – email
Josh Bryson / Atlantic Richfield - email
Mike Mc Anulty / Atlantic Richfield - email
Loren Burmeister / Atlantic Richfield – email
Dave Griffis / Atlantic Richfield - email
Jean Martin / Atlantic Richfield - email
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
Wil George / 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
Lauren Knickrehm / 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
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

Figures

Figure 1 – Insufficiently Reclaimed Sites BRES No. 38 Sister Dump Proposed Sample Stations



LEGEND

- SAMPLE UNDER IR QAPP
- SAMPLE UNDER UR QAPP
- HISTORIC SAMPLE STATIONS
- INSUFFUCIENTLY RECLAIMED AREAS
- PROPOSED IR BOUNDARY CHANGES
- BRES EVALUATION EXPOSED WASTE
- BRES EVALUATION BARREN AREA
- BSB REMEDIAL ACTION AREA

THE PARCEL BOUNDARIES SHOWN ARE FOR REFERENCE USE ONLY AND DO NOT REPRESENT A LEGAL SURVEY

N

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

0 50 100 200
Feet

FIGURE 1

INSUFFICIENTLY RECLAIMED SITES BRES No. 38 SISTER DUMP PROPOSED SAMPLE STATIONS

PIONEER TECHNICAL SERVICES, INC.

DATE: 5/10/2022

Path: Z:\Shared\Active Projects\ARCO\BPSOU\LandSupport\SolidMedia\Insufficiently_Unreclaimed\IR_Sampling\IR38_Fig_001_22.mxd

Attachment 1
Document Links

Document Links

Insufficiently Reclaimed Sites QAPP:

Link will be provided upon approval of the 2022 IR QAPP, which was submitted on May 20, 2022.

Unreclaimed Sites QAPP:

https://pioneertechnicalservices.sharepoint.com/:f:/s/submitted/Ev1dhUeMuUdLjU8tnuV5RioBvJZRYc2HpgEjM9KzT-PpjQ.