Summer 7-29-2022

Butte Priority Soils Operable Unit (BPSOU) Final Insufficiently Reclaimed Sites - Field Sampling Plan (FSP) BRES No. 37 – Josephine Shaft

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July 29, 2022

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Re: Butte Priority Soils Operable Unit (BPSOU) Final Insufficiently Reclaimed Sites - Field Sampling Plan (FSP) BRES No. 37 – Josephine Shaft.

Dear Agency Representatives:

I am writing to you on behalf of Atlantic Richfield Company to submit the Butte Priority Soils Operable Unit (BPSOU) Final Insufficiently Reclaimed (IR) Sites - Field Sampling and Investigation Plan (FSP) Butte Remediation Evaluation System (BRES) No. 37 – Josephine Shaft per the Agency approval letter dated July 26, 2022. Comments provided in the approval letter are addressed within this Final FSP below.

The Agency approval letter can be accessed at the following link:

https://pioneertechnicalservices.sharepoint.com/:b:/s/submitted/EVXOxW8VNrdEkWReot1reasBo86JBQE1bstd6aIyKu5mnQ[1].

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 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

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

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 the IR Sites QAPP). The IR Sites QAPP is available at the following link:

https://pioneertechnicalservices.sharepoint.com/:f:/s/submitted/Eid2SfSSinhOsfQXY5CXGEoBe5IIf5IQO01hBO43ZROgpg[2].

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 the 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[3].

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. 37 – Josephine Shaft. Proposed soil sampling stations and areas of known deficiencies are shown on Figure 1.

The site evaluation is anticipated to be completed in 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 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] Please note the link provided is valid for one year from the date of this submittal.
[3] Please note the link provided is valid for one year from the date of this submittal.

Submittal	Site	Submittal Date	Approval Date
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. 32 – Corra 2 Dumps	6/20/2022	6/30/2022
8	BRES No. 158 – Waste Rock Dump	6/20/2022	7/11/2022
9	BRES No. 50 – Zelia	6/22/2022	6/30/2022
10	BRES No. 93 – Soudan Dump	6/23/2022	6/30/2022
11	BRES No. 96 – Washoe Dump	6/23/2022	7/11/2022
12	BRES No. 133 – Dexter Mill	7/14/2022	7/26/2022
13	BRES No. 37 – Josephine Shaft	7/20/2022	7/26/2022
14	BRES No. 34 - Eveline	7/22/2022	

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, and 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 Josephine Shaft (BRES No. 37) is approximately 4.7 acres located northeast of the Sister Dump. Reclamation work encompassed approximately 1 acre of the site. Existing slopes on the site were less than 3 horizontal:1 vertical, and no additional recontouring was required. Prior to reclamation, an average field pH of 4.4 standard units (S.U.) was measured on the site. Anaconda Quarry limestone was applied at a rate of 350 tons per acre. After the application of limestone, 18 inches of Tiger Lily cover soil was placed over the site. A 60-foot-long, 4-foot-wide riprap channel was constructed to transport storm water across the site. Alexander Street, bordering the north edge of the site, was graded to drain into the riprap channel.

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 future site evaluation, sampling, and remedial action. A preliminary review of the 2019 evaluation findings indicates 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 contain the records for previous soil samples collected near BRES No. 37 – Josephine Shaft. 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: **FSUA-10**	Sample ID: **TB-SO-10**
Arsenic	65 mg/kg	35 mg/kg	124 mg/kg
Cadmium	16 mg/kg	0 mg/kg	7 mg/kg
Copper	386 mg/kg	495 mg/kg	800 mg/kg
Lead	2,310 mg/kg	3,220 mg/kg	1,070 mg/kg
Zinc	3,050 mg/kg	1,630 mg/kg	1,900 mg/kg
pH	4.64 S.U.	3.78 S.U.	4.60 S.U.

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

Preliminary Site Evaluation

A preliminary site visit was conducted 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. Multiple areas

of erosion and bare areas were identified in addition to run-on/runoff issues associated with storm water through the middle of the site and along the southern boundary. Areas of potential mine waste were also identified along the south and east boundaries as shown on the site photographs below. Moose ditch is located east of the Reclaimed Area boundary and does not appear to be affected by the sediment transportation through the site.

Photograph 1: Erosion Rills Active on South Slope

Photograph 2: Possible Mine Dump Within Proposed Insufficiently Reclaimed Sampling Boundary

Photograph 3: Gully Developing on North Slope from Possible Storm Water Controls

Photograph 4: Gully Developing on East Side of Excavation Area

Photograph 5: Gully Developing Near Possible Mine Dump (South Boundary)

The site consists of a possible Mining Dump (Photograph 1, Photograph 2, Photograph 6, and Photograph 9) within the proposed IR sampling boundary. The dump is actively eroding and is currently transporting materials off site toward IR-38 (Sister Dump). Slopes and gullies, shown on Photograph 1 through Photograph 5, will be evaluated to mitigate erosion. The evaluations will consider regrading, vegetation, 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 can be developed with remedial erosion controls to establish vegetation or if riprap armoring provides a more suitable long-term remedy.

Photograph 6: Barren Area on Top of Possible Mine Dump

Photograph 7: Vegetated Area South of Excavation Area

A large area that appears to be a historical excavation pit is actively eroding (Photograph 7). There are two gullies forming on the west, north, and east ridges. A berm at the toe of the slope is currently capturing most of the sediment that is being transported off the slope. Slopes, shown on Photograph 6 and Photograph 7, will be evaluated to mitigate erosion. The evaluations will consider regrading, vegetation, or armoring requirements. A local biology/plant ecologist, or suitable 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 8 and Photograph 9 show barren areas consisting of possible mine dump material and a rock outcropping. Barren areas are experiencing storm water flows causing sheet erosion and gully development. Most of the sediment transported on the eastern portion of the site is being deposited within the site boundaries.

Photograph 8: Barren Rock Outcropping on East Boundary

Photograph 9: Barren Area Eroding on South Boundary

Photograph 10: Moose Ditch

Existing storm water controls include Moose ditch, a grass/riprap ditch, located on the eastern boundary of the site (Photograph 10). Moose ditch will be evaluated to determine its effectiveness and identify additional Best Management Practices or potential maintenance items.

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 to 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. The site sampling boundary has been expanded from the originally reclaimed area boundary to address potential gap areas. 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 applied to the determination of the final site declaration.

Existing site grading and drainages will be evaluated to determine storm water flow patterns and identify whether additional storm water controls are necessary to prevent sediment migration. The location and condition of existing storm water features will be field verified and recorded to implement appropriate corrective actions. Upgradient and adjacent contributing sources of storm water will also be investigated.

Items identified below will be evaluated to determine whether they are adequate and to identify additional remedial measures. The following provides the minimum 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 SME.
- Evaluate steep slopes for regrading and to determine if possible mining waste is eroding.
- Evaluate existing storm water controls designed for a 25-year, 24-hour Soil Conservation Service Type I storm event as needed.
- Evaluate the need for site storm water controls to mitigate run-on/runoff.
- Identify remedial improvements to mitigate site erosion and improve vegetative areas to meet BHRS.
- Identify maintenance items for successful long-term operation.

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-37-SS01	(1) 0-6, (2) 6-18
IR-37-SS02	(1) 0-6, (2) 6-18
IR-37-SS03	(1) 0-6, (2) 6-18
IR-37-SS04	(1) 0-6, (2) 6-18
IR-37-SS05	(1) 0-6, (2) 6-18
IR-37-SS06	(1) 0-6, (2) 6-18
IR-37-SS07	(1) 0-6, (2) 6-18
IR-37-SS08	(1) 0-6, (2) 6-18
IR-37-SS09	(1) 0-6, (2) 6-18
IR-37-SS010	(1) 0-6, (2) 6-18
IR-37-SS011	(1) 0-6, (2) 6-18
IR-37-SS012	(1) 0-6, (2) 6-18
IR-37-SS013	(1) 0-6, (2) 6-18
IR-37-SS014	(1) 0-6, (2) 6-18
IR-37-SS015	(1) 0-6, (2) 6-18

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

Sample Station	3 Depth Intervals (inches)
IR-37-SS16	(3) 0-2, (4) 2-6, and (5) 6-12
IR-37-SS17	(3) 0-2, (4) 2-6, and (5) 6-12
IR-37-SS18	(3) 0-2, (4) 2-6, and (5) 6-12
IR-37-SS19	(3) 0-2, (4) 2-6, and (5) 6-12
IR-37-SS20	(3) 0-2, (4) 2-6, and (5) 6-12
IR-37-SS21	(3) 0-2, (4) 2-6, and (5) 6-12
IR-37-SS22	(3) 0-2, (4) 2-6, and (5) 6-12
IR-37-SS23	(3) 0-2, (4) 2-6, and (5) 6-12
IR-37-SS24	(3) 0-2, (4) 2-6, and (5) 6-12
IR-37-SS25	(3) 0-2, (4) 2-6, and (5) 6-12
IR-37-SS26	(3) 0-2, (4) 2-6, and (5) 6-12
IR-37-SS27	(3) 0-2, (4) 2-6, and (5) 6-12

Fieldwork is anticipated to be performed in 2022, depending on whether access is obtained for all subject parcels.

Site Summary Report and Declaration

After the site evaluation and data collection activities are complete, 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. 37 Josephine Shaft Proposed Sample Stations
Attachment 1 - Linked Documents

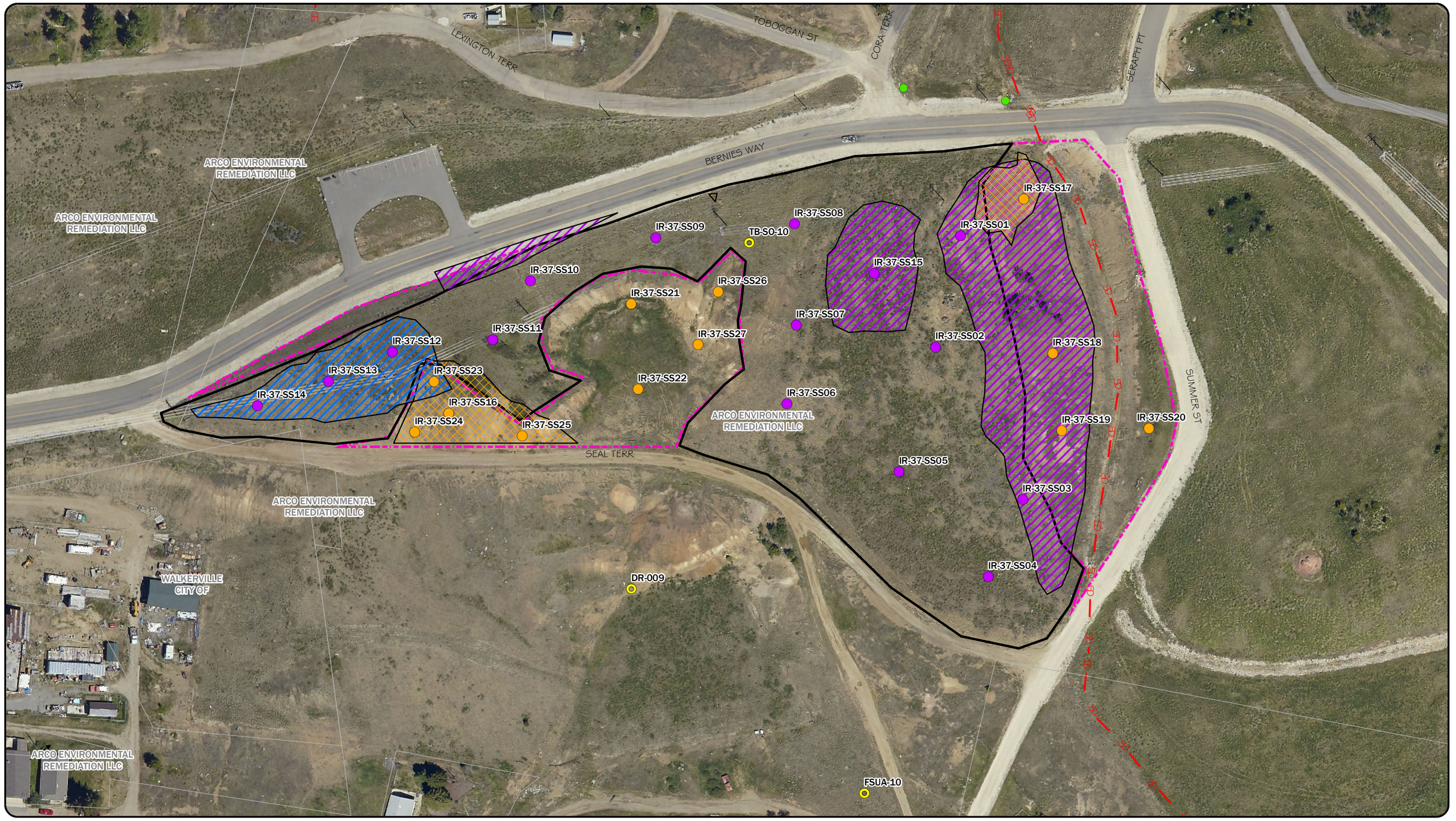
Cc: Patricia Gallery / Atlantic Richfield - email
Chris Greco / Atlantic Richfield – email
Josh Bryson / Atlantic Richfield - email
Loren Burmeister / Atlantic Richfield – email
Dave Griffis / Atlantic Richfield - email
Jean Martin / Atlantic Richfield - email
Irene Montero / Atlantic Richfield - email
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. 37 Josephine Shaft Proposed Sample Stations



LEGEND

- SAMPLE UNDER IR QAPP
- SAMPLE UNDER UR QAPP
- HISTORIC SAMPLE STATIONS
- PROPOSED IR BOUNDARY CHANGES
- INSUFFUCIENTLY RECLAIMED AREAS
- BRES EVALUATION EXPOSED WASTE
- BRES EVALUATION BARREN AREA
- BRES EVALUATION VEGETATIVE IMPROVEMENT
- SD — STORM WATER LINE
- STORM WATER OUTLET

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. 37 JOSEPHINE SHAFT PROPOSED SAMPLE STATIONS

PIONEER TECHNICAL SERVICES, INC.

DATE: 4/27/2022

Path: Z:\Shared\Active Projects\ARCO\BPSOU\LandSupport\SolidMedia\Insufficiently_Unreclaimed\IR_Sampling\IR37_Fig_001_22.mxd

Attachment 1
Linked Documents

Linked Documents

Insufficiently Reclaimed Sites QAPP:

https://pioneertechnicalservices.sharepoint.com/:f:/s/submitted/Eid2SfSSinhOsfQXY5CXGEoBe5IIf5IQO01hBO43ZROgpg[4].

Unreclaimed Sites QAPP:

https://pioneertechnicalservices.sharepoint.com/:f:/s/submitted/Ev1dhUeMuUdLjU8tnuV5RioBvJZRYc2HpgEjM9KzT-PpjQ[5].

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