Fall 9-20-2024

Butte Priority Soils Operable Unit (BPSOU) Final Insufficiently Reclaimed Sites Field Sampling Plan (FSP) BRES No. 52 – Moscow Dump

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Re: Butte Priority Soils Operable Unit (BPSOU) Final Insufficiently Reclaimed Sites Field Sampling Plan (FSP) BRES No. 52 – Moscow Dump.

Dear Agency Representatives:

I am writing to you on behalf of Atlantic Richfield Company (Atlantic Richfield) to distribute the Butte Priority Soils Operable Unit (BPSOU) Final Insufficiently Reclaimed (IR) Sites – Field Sampling and Investigation Plan (FSP) Butte Remediation Evaluation System (BRES) No. 52 – Moscow Dump per the Agency approval received September 16, 2024. A link to the Agency approval letter is provided in Attachment 1.

As described in Appendix D, Attachment C, Section 7.0 of the 2020 BPSOU Consent Decree (BPSOU CD) (available at BPSOU CD), sites within the BPSOU reclaimed prior to the establishment of the Butte Hill Revegetation Specifications (BHRS), Appendix A of the BPSOU CD, are considered IR Solid Media Sites. 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 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 *2024 Final Insufficiently Reclaimed Sites Quality Assurance Project Plan (QAPP)* (referred to herein as IR Sites QAPP). A link to the IR Sites QAPP is provided in Attachment 1. A list of approved FSPs is provided in Attachment 2.

The sampling boundary and proposed soil sampling stations and deficiencies identified during previous BRES evaluations are shown on Figure 1.

Field sampling within the existing boundary will be performed to determine whether contaminants are present, whether the existing cap and supported growth media are sufficiently protective of human health and the environment, how observed site conditions compare to the BHRS, and whether there are previously unidentified conditions contributing to site deficiencies.

The site evaluation is anticipated to be completed in 2024. 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 soil action levels for human health, soil screening criteria, and cover soil chemical suitability criteria provided in the IR Sites QAPP. Samples obtained outside of the existing reclaimed area will be evaluated following the soil action levels for human health and soil screening criteria for waste identification in the Atlantic Richfield *2024 Unreclaimed* (UR) *Sites QAPP* (referred to herein as UR Sites QAPP). A link to the UR Sites QAPP is provided in Attachment 1.

If further remediation is recommended after the evaluation and sampling is complete, a remedial action work plan (RAWP) describing actions that will be implemented at the site will be provided for Agency review and approval.

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

	Reference Location		
Element	**FSP**	**IR Sites QAPP**	**UR Sites QAPP**
Title Page and Approval Authority	Approval Letter	Page i	Page i
Site Introduction and Appropriate Agency-Approved QAPP Reference	Page 1, Page 2		
Data Quality Objectives		Section 2.5	Section 2.5
Site and Sampling Objectives	Figure 1	Section 3.0	Section 3.0
Proposed Schedule for Site Field Work	Page 2		
Site Figure	Figure 1		
Sampling Procedures and Standard Operating Procedures		Section 3.2 Appendix B	Section 3.2 Appendix B
Sample Analysis Methods		Section 3.3	Section 3.3

Background

The Moscow Dump (BRES No. 52) is approximately 4.5 acres located west of North Montana Street and is bounded by the Northeast Syndicate Dump – Oro Butte Shaft (BRES Site No. 160) on the west and the Tullamore Dumps (BRES Site No. 180) to the south. The Missoula Ball Field is directly west

of the site. As described in the BPSOU *Source Areas and Reclaimed Boundary Adjustments*[11], reclamation was completed in 1985 by Atlantic Richfield and consisted of grading the area and placing 6 inches of cover soil and a veneer of lime rock over the site. Limestone veneer (approved by EPA) consisting of 2 inches of limestone, referred to as "desert paving" was installed. The Upper Missoula Gulch Channels, also referenced as the Centerville ditches, run along the western and southern edges of the site. In 1998, 12 inches of landfill soil was added to the edge of the existing Centerville Ditch and Dillon manure was spread over the cover soil at 30 dry tons per acre. The site was fertilized on July 20, 1998. Manure and fertilizer were chisel plowed into the top 6 inches of cover soil. Straw mulch was spread at a rate of 2 tons per acre and crimped into the cover soil on July 28, 1998. The site was drill seeded on October 23, 1998, with perennial seed mix at a rate of 19 pounds per acre. The southern portion of the site (Moscow Dump area) was remediated by applying 2 inches of lime rock to the existing soil; this is known as desert paving. No additional vegetation was applied to this area.

An adjusted boundary was proposed for BRES No. 52 – Moscow Dump, to accurately represent the reclaimed area and align site boundaries with completed site remediation efforts. As described in the BPSOU *Source Areas and Reclaimed Boundary Adjustments*[1], this was completed by using a high-resolution aerial image and visual comparisons to identify the areas of apparent remediation. Note that the Agencies have not approved the proposed adjusted boundary. The site is comprised of an engineered cover and a vegetated portion. The proposed boundary for the vegetated area was revised to match apparent reclamation vegetation visible from updated aerial imagery. Residential yards within the source area boundary may be excluded only after the Residential Metals Abatement Program (RMAP) sampling and remediation (if necessary) processes have been completed. The area of the site comprised of "desert paving" will become a separate, engineered cover.

Previous Evaluation Findings

As specified in the BPSOU CD, information collected during previous site investigations has been reviewed and incorporated into the proposed sampling design. Given the date of remediation, the site should be investigated to ensure the cap is adequate for operation and maintenance.

The site was evaluated in 2017 and 2021 during the recurring 4-year cycle of field evaluations of previously reclaimed sites within the BPSOU. The results from both BRES Field Evaluation Summary and Technical Recommendation Reports indicate the grass portion of the site has a high amount of live vegetation with a low number of undesirable species. The evaluations suggest the engineered cap portion of the site suffers from barren areas, increased erosion, rills, and possible exposed waste. Sample locations are proposed in the barren areas along with a proposed sample outside of the boundary in the potential exposed waste. Active gullies run down the old maintenance road and are depositing sediment further down the site.

[1] Atlantic Richfield Company and Butte-Silver Bow, 2022. Draft Final Source Areas and Boundary Adjustments. Prepared by Pioneer Technical Services, Inc. April 4, 2022.

Previous Sampling Efforts

The BPSOU OneMap database contains the records for previous soil samples collected within the BPSOU. The approximate sample stations located on the BRES No. 52 – Moscow Dump site are included on Figure 1 with results provided in Table 1 below. Highlighted sample results exceed the BPSOU CD solid media soil screening criteria. The BPSOU soil action levels and screening criteria are listed in Table 1 and Table 2, respectively, in Section 2.5 of the IR Sites QAPP.

Table 1: Previous Sampling Results from BPSOU Soil Sampling

COCs	Sample ID: **038-WA-06**	Sample ID: **CON001-MI**
Arsenic	404 mg/kg	261 mg/kg
Cadmium	4 mg/kg	14 mg/kg
Copper	1,480 mg/kg	1,130 mg/kg
Lead	1,197 mg/kg	851 mg/kg
Zinc	2,940 mg/kg	4,480 mg/kg
pH	4.05 S.U.	NA

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

Preliminary Field Visit

A preliminary field visit occurred during the development of this sampling plan to qualify current site conditions, identify focus areas for further investigation, identify site deficiencies and soil staining, or potential sediment migration areas. Sampling locations were determined by this preliminary field visit to determine site conditions, satellite imagery, and BRES evaluations from Butte-Silver Bow (BSB). A site evaluation will be conducted immediately prior to field activities to confirm the site sample locations. Photograph 1 through Photograph 4 taken during the field visit, show an overview of the site.

Photograph 1. Overview of site from walking trail facing northeast

Photograph 2. Overview of site facing northwest.

Photograph 3. Overview of desert paved area and barren area with slight staining.

Photograph 4. Maintenance road access and rock lined channel on the east side of site.

The area will be further investigated during site sampling for potential opportunistic sample location(s). Figure 1 illustrates the proposed sample stations for BRES No. 52.

Site Characterization Plan

Per the IR Sites QAPP, the site will be sampled at two 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. 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 number and depth of samples as dictated by field conditions.

Samples collected within the approved BRES boundary will be sampled following procedures in the IR Sites QAPP using a systematic procedure to determine the extent of waste present, previous reclamation, and transient material. Note, the area comprised of desert paving will not be sampled for BHRS analysis as it is a non-vegetative cap and was not intended to grow vegetation. The grass area within the proposed boundary change will be evaluated for BHRS.

Samples collected outside of the original BRES boundary will be collected following the protocol described in the 2024 UR Sites QAPP. Samples obtained outside of the original boundary will be obtained from three depth intervals [(3) 0 to 2 inches, (4) 2 to 6 inches, and (5) 6 to 12 inches] per the UR Sites QAPP sampling protocol.

Field and laboratory analytical results will be used to prepare the site declaration and prescribe site remedial improvements.

Existing site grading and drainages will be visually evaluated per the data sheet provided in Attachment 3 to determine storm water flow patterns and identify if additional storm water controls will help prevent sediment migration. Contributing sources of storm water upgradient and adjacent to the site will also be investigated.

At minimum, items identified below, but not specifically detailed in the QAPP, may be visually evaluated to determine adequacy and to identify if additional remedial measures are necessary. Additional items also may be identified during the remedial design process.

- Evaluate relative percent vegetative cover (as needed).
    - Coordinate and confirm plant species with biology/plant ecologist or related subject matter expert (as needed).
- Evaluate the performance of existing storm water controls to mitigate run-on/runoff.
- Evaluate location and condition of existing storm water controls.
- Identify potential remedial improvements to mitigate site erosion and vegetative areas to meet the BHRS.
- Identify necessary maintenance for successful long-term operation.
- Evaluate steep slopes for erosion of possible mining waste and potential for regrading.

The 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 prior to implementation.

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 describes the quality assurance/quality control policies and procedures that will be used during sample collection and analyses.

Sample Station	Two Depth Intervals (inches)
IR-52-SS01	(1) 0-6, (2) 6-18
IR-52-SS02	(1) 0-6, (2) 6-18
IR-52-SS03	(1) 0-6, (2) 6-18
IR-52-SS04	(1) 0-6, (2) 6-18
IR-52-SS05	(1) 0-6, (2) 6-18
IR-52-SS06*	(1) 0-6, (2) 6-18
IR-52-SS07*	(1) 0-6, (2) 6-18
IR-52-SS08*	(1) 0-6, (2) 6-18
IR-52-SS09*	(1) 0-6, (2) 6-18
IR-52-SS10*	(1) 0-6, (2) 6-18
IR-52-SS11*	(1) 0-6, (2) 6-18
IR-52-SS12*	(1) 0-6, (2) 6-18
IR-52-SS13*	(1) 0-6, (2) 6-18
IR-52-SS14*	(1) 0-6, (2) 6-18
IR-52-SS15*	(1) 0-6, (2) 6-18

*Sample Station intervals [(1) 0-6 inches] will not be sent to the laboratory for non-metals analyses as they are proposed sample locations in the engineered 'desert paved' cap and therefore do not meet BRES requirements.

All soil sampling and characterization activities and procedures outside of the existing site boundary will follow the UR Sites QAPP. Samples will be obtained from the sample station listed below.

Sample Station	Three Depth Intervals (inches)
IR-52-SS16	(3) 0-2, (4) 2-6, (5) 6-12

Site Summary Report and Declaration

After the site evaluation and data collection activities are complete, a site evaluation 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 criteria as specified in the BPSOU CD.

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:

- Figures
- Attachment 1– Document Links
- Attachment 2– FSP Submittal List
- Attachment 3– Field Data Sheet

Cc: (email only)

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Loren Burmeister / Atlantic Richfield
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Emily Evans / W&C
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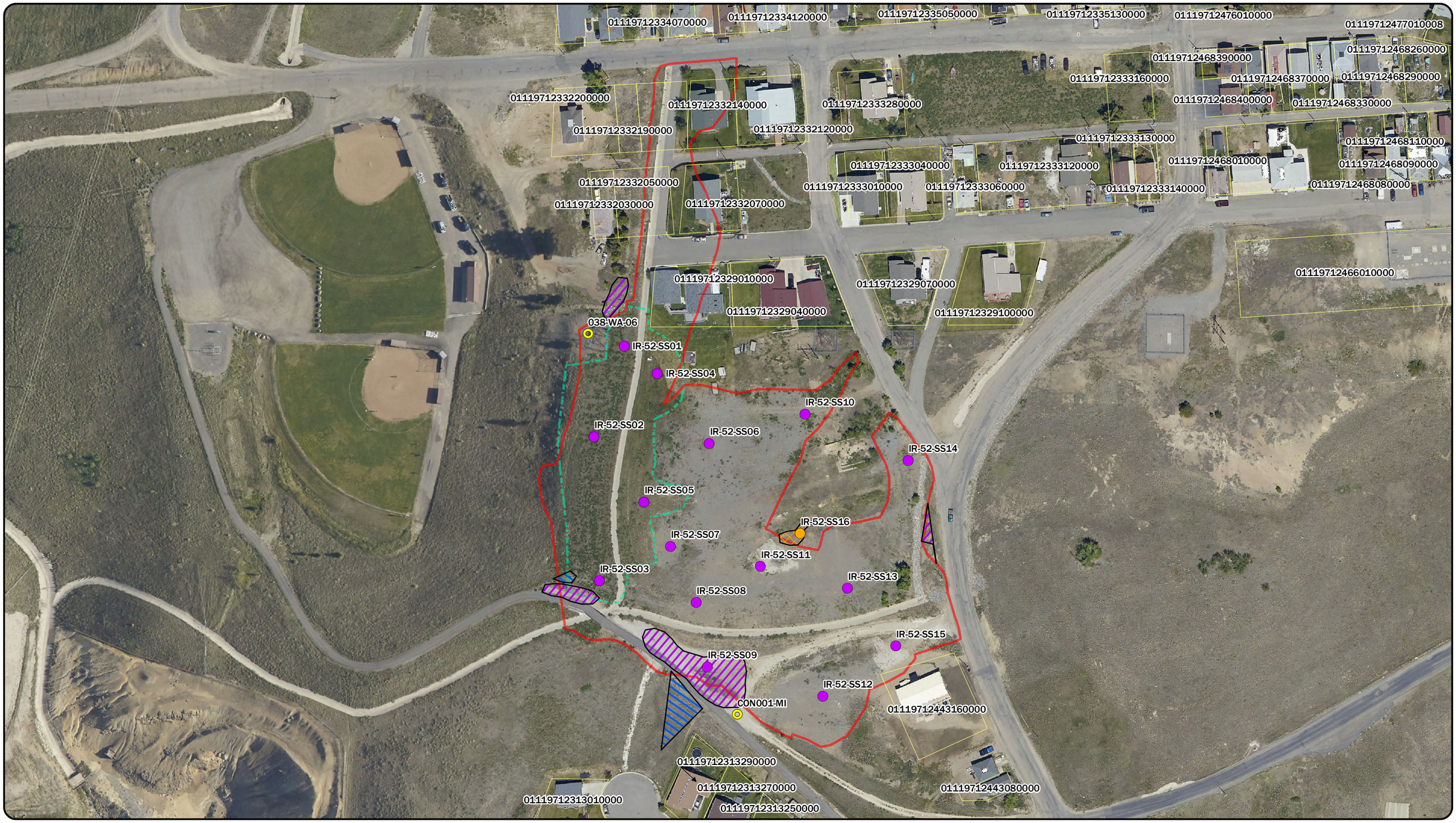
Karen Helfrich / Pioneer
Brad Hollamon / Pioneer
Randa Colling / Pioneer
Rich Keeland / Aspect
Andy White / Aspect
Ian Magruder/ CTEC
CTEC of Butte
Scott Juskiewicz / Montana Tech

File: RMO – upload
BPSOU SharePoint – upload

Figures

Figure 1 - Insufficiently Reclaimed Sites BRES No. 52 - Moscow Dump Proposed Sample Stations



LEGEND

- SAMPLE UNDER IR QAPP
- SAMPLE UNDER UR QAPP
- HISTORIC SAMPLE STATIONS
- PROPERTY OWNERSHIP
- BRES BOUNDARY (ORIGINAL)
- BRES BOUNDARY (PROPOSED ADJUSTMENT)
- BRES EVALUATION EXPOSED WASTE
- BRES EVALUATION BARREN AREA
- BRES EVALUATION VEGETATIVE IMPROVEMENT

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 60 120 240
Feet

FIGURE 1

INSUFFICIENTLY RECLAIMED SITE BRES No.52 MOSCOW

PIONEER TECHNICAL SERVICES, INC.

DATE: 3/8/2024

Path: Z:\Shared\Active Projects\ARCO\BPSOU\LandSupport\SolidMedia\Insufficiently_Unreclaimed_UR_IR_Sampling_FSP_IR_Sampling_FSP\Sampling_2024_FSP\IR52_FSP_001_24.mxd

Attachment 1
Document Links

Document Links

Insufficiently Reclaimed Sites QAPP:

Final 2024 IR Sites QAPP

Unreclaimed Sites QAPP:

Final 2024 Unreclaimed Sites QAPP

Agency Approval Letter:

Agency Approval Letter

Attachment 2
FSPs Submittal List

Site	Submittal Date	Approval Date
BRES No. 104 – Colorado Dump Shaft	9/29/2021	11/5/2021
BRES No. 104 – Colorado Dump Shaft, Final Revised	12/2/2021	12/6/2021
BRES No. 154 – Clark Mill Tailings NE	12/1/2021	12/6/2021
BRES No. 30 – Atlantic-1	1/12/2022	2/22/2022
BRES No. 16 – Curry	1/12/2022	2/22/2022
BRES No. 8 – Belle of Butte	3/11/2022	9/26/2022
BRES No. 38 – Sister Dump	6/16/2022	9/26/2022
BRES No. 32 – Corra 2 Dump	6/20/2022	6/30/2022
BRES No. 158 – Waste Rock Dump	6/20/2022	7/11/2022
BRES No. 50 Zelia	6/22/2022	6/30/2022
BRES No. 93 – Soudan Dump	6/23/2022	6/30/2022
BRES No. 96 Washoe Dump	6/23/2022	7/11/2022
BRES No. 133 – Dexter Mill	7/14/2022	7/26/2022
BRES No. 37 – Josephine Shaft	7/20/2022	7/26/2022
BRES No. 34 – Eveline Dump	7/22/2022	8/2/2022
BRES No. 17 – Paymaster	7/25/2023	8/10/2023
BRES No. 31 – Waste Dump #5	7/25/2023	8/10/2023
BRES No. 48 – Old Glory West	7/25/2023	8/10/2023
BRES No. 66 – West Ruby Dump	7/25/2023	8/10/2023
BRES No. 68 – Little Mina-2	7/25/2023	8/10/2023
BRES No. 174 – Buffalo South and Buffalo Ditch	7/25/2023	8/10/2023
BRES No. 84 – Mandan Park	7/25/2023	8/2/2023
BRES No. 125 – Child Harold – Dump	8/8/2024	6/28/2024
BRES No. 121 – Travona Dump	8/8/2024	6/28/2024
BRES No. 34E – Eveline Dump East	9/20/2024	9/16/2024
BRES No. 45 – Garfield	8/8/2024	
BRES No. 49 – Old Glory	8/8/2024	6/28/2024
BRES No. 52 – Moscow	9/20/2024	9/16/2024
BRES No. 74 – West Gagnon Dump	8/8/2024	6/28/2024
BRES No. 78 – Original Mine	9/20/2024	9/16/2024

Attachment 3
Field Data Sheet

Site: Date: Personnel:

Are rills present? If yes, describe.

Areas of flow present? Is sediment being deposited? Describe.

Describe any flow patterns from above/on to site.

Describe any flow patters below/off-site.

Identify stormwater infrastructure on/adjacent to the Site. Describe the condition (ie. new construction, heavily sedimented, etc.)

General Site Observations (Presence/type/condition of cap, Vegetation, Soil staining, Structures on Site, etc.)