Summer 8-1-2022

Revised Draft Final Solid Media Management Program Plan

Pioneer Technical Services, Inc.

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RE: Butte Priority Soils Operable Unit (BPSOU) Draft Final Solid Media Management Program Plan

Agency Representatives:

On behalf of Atlantic Richfield Company and Butte-Silver Bow, the revised Butte Priority Soils Operable Unit (BPSOU) Draft Final Solid Media Management Program Plan is being submitted. Response to Agency comments, provided on December 15, 2021, are provided below and have been incorporated into the revised document.

General Comments

- *Executive Summary: Each program does not seem to contain a specific QAPP, M&M plan, and work plan. Not sure this is necessary, but EPA found the Executive Summary confusing and led one to believe that each of the non-residential reclaimed, non-residential unreclaimed, and RMAP sites needed these three plans to manage each. Due to this confusion, EPA suggests that the Executive Summary be deleted or significantly revised to provide a more complete picture of the purpose of the solid media plan.*

Settling Defendants' Response: The Executive Summary has been deleted as recommended.

Specific Comments

- *List of Appendices, Appendix G Non-Residential Metals Abatement Program Quality AssuranceProject Plan: To be consistent with the document submitted to Agencies it is recommended to change the title to Residential Metals Abatement Program Quality Assurance Project Plan (Non-Residential Parcels). Check globally throughout and*

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abbreviate to "RMAP QAPP (Non- Residential Parcels)". Additionally, this Appendix is not referenced in this report. Please describe within the document the purpose of this plan and how it fits into the program within the text (i.e., in this case, the RMAP sampling and analyses of non-residential properties [i.e., schools, parks, and non-residential daycares] is anticipated to be a one-time event and to describe the QA/quality control [QA/QC] policies and procedures to be used during these efforts). Please add another section heading "2.3.1" to discuss RMAP (Non-Residential Parcels) since sampling would be conducted under a separate QAPP, and please differentiate between the interior dust sampling and soils QAPPs.

Settling Defendants' Response: Section 2.3.1 has been added to the revised Plan as requested. Section 5.1 provides additional differentiation between the various QAPPs implemented by RMAP.

- *Section 1, Page 1-2, Appendix G Text: Revise title to "RMAP QAPP (Non-Residential Parcels)".*

Settling Defendants' Response: The text has been revised as requested to address Non-Residential Parcels. All QAPPs related to RMAP are listed in Appendix E.

- *Section 1.3.1, Page 1-6, Appendix G Text: It is not clear for which sections are referring to "Section 2.0", The first sentence states "…are described in Section 12 of the ROD…), following text discusses Section 2.0, 3.0, and 2.5 in subsequent sentences and paragraphs. Recommend adding "in this plan" or similar language to make clear that additional section references are referring to the SMMPP and check throughout document.*

Settling Defendants' Response: The text has been revised as requested.

- *Section 1.4, Page 1-6: There are more elements than monitoring, inspections, reclamation, and maintenance tasks associated with these programs and schedule (i.e., outreach, database upkeep,etc.). Revise the text to reflect that there are these additional elements and to note that the SDs will perform activities as described within each specific program. Also include reference to the 2020 UAO Amendment SOW and that those requirements will be performed as well.*

Settling Defendants' Response: The text has been revised.

- *Section 1.4, Page 1-7, first paragraph: Revise text to make this more of a programmatic schedule statement, such as "...is anticipated to begin in the spring of 2021 and continue as weather permits, with a reoccurring schedule each year as applicable." or similar language.*

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Settling Defendants' Response: The text has been revised.

- *Section 2.3, Page 2-2, first paragraph: Please move where "(Figure 2)" is referenced within the sentence and move to the end. Figure 2 shows the extents of the various RMAP perimeters.*

Settling Defendants' Response: The text has been revised.

- *Section 2.5: In the near future, railroad BRES sites need to be added to BSB BRES database to protect sites from disturbances through zoning and permit protections. For example, a few years ago BSB graded in a road and snow storage area in a railroad vegetative cap that was in good shape. This affirms the need for a master BPSOU SMMPP figure and table list that includes BSB/AR and railroad sites. Please add text stating that a universal database and map of BRES sites will be prepared in the future for management purposes. In addition, does the Rarus railroad monitoring and maintenance need to be describe within this plan?*

Settling Defendants' Response: Section 2.5 has been revised to describe the future development of a universal database. Section 2.8 RARUS Railway Properties has been added to include maintenance and monitoring responsibilities associated with the RARUS railroad.

Section 6.1, page 6-1: Not all railroad BRES sites are shown on the figure. Please revise and update figure to include all railroad BRES sites in future revisions.

Settling Defendants' Response: Railroad properties outside the scope of Settling Defendants' O&M responsibilities have been added to the revised figure. Additional details regarding railroad Butte Remediation Evaluation System (BRES) sites may be added in coordination with development of the universal database.

End of Comments.

The revised plan and appendices may be downloaded at the following link:

https://pioneertechnicalservices.sharepoint.com/:f:/s/submitted/EnhKIEW6UqlPlyl5YSZaNmoBh3Ech2nbAeHTfAQzm68Vww.

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If you have any questions or comments, please call me at (907) 355-3914, or Eric Hassler at (406) 497-5042.

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

Revised Draft Final

Solid Media Management Program Plan

Atlantic Richfield Company

2022

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

Revised Draft Final

Solid Media Management Program Plan

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2022

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LIST OF APPENDICES

DOCUMENT REVISION

Revision No.	Author	Version	Description	Date

Acronyms

Acronym	Definition
BHRS	Butte Hill Revegetation Specifications
BMP	Best Management Practices
BPSOU	Butte Priority Soils Operable Unit
BRES	Butte Reclamation Evaluation System
BSB	Butte-Silver Bow
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminants of Concern
CTEC	Citizens Technical Environmental Committee
DEQ	Department of Environmental Quality
EPA	(U.S.) Environmental Protection Agency
ERA	Expedited Response Action
FSPRA	Field Survey of Previously Reclaimed Areas
FSUA	Field Survey of Unreclaimed Areas
IC	Institutional Control
ICIAP	Institutional Controls Implementation and Assurance Plan
LAO	Lower Area One
M&M	Maintenance and Monitoring
mg/kg	milligrams per kilogram
NPL	National Priorities List
NTCRA	Non-Time Critical Removal Action
OU	Operable Unit
PLS	Pure Live Seed
PRP	Primary Responsible Party
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objectives
RAWP	Remedial Action Work Plan
RI/FS	Remedial Investigation/Feasibility Study
RMAP	Residential Metals Abatement Program
ROD	Record of Decision
RODA	Record of Decision Amendment
RRU	Reclamation Research Unit
SD	Settling Defendants
SOW	Statement of Work
TCRA	Time Critical Removal Action
UAO	Unilateral Administrative Order
WSSOU	West Side Soils Operable Unit

1.0 INTRODUCTION

The BPSOU is one of three remedial operable units (OUs) identified by the U.S. Environmental Protection Agency (EPA) within the Butte Area portion of the Silver Bow Creek/Butte Area National Priorities List (NPL) site within and near Butte, Montana. The BPSOU consists of historical mining sites situated entirely within an urban setting, encompassing much of the cities of Butte and Walkerville, Montana. Accumulations of mine waste and mill tailings from over 100 years of mining are dispersed throughout the OU, posing health risks to human and ecological receptors. As stated in the 2020 BPSOU Consent Decree (CD) (EPA, 2020a) (referred to herein as BPSOU CD), remedial action selected in the 2006 BPSOU Record of Decision (ROD), as amended in the 2011 BPSOU Explanation of Significant Differences (ESD) and the further amended response actions described in the 2020 ROD Amendment (RODA), are necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment at the BPSOU. All three documents are included as Appendix A of the BPSOU CD.

Within BPSOU, solid media is considered contaminated soil, indoor dust, waste rock, and tailings. Solid media with concentrations of contaminants of concern (COCs) above action levels described in the ROD, ESD, and RODA (Appendix A of the BPSOU CD) and Appendix D Statement of Work (SOW) of the BPSOU CD require response actions to meet established criteria.

This BPSOU Solid Media Management Program Plan encompasses the various programs in place to appropriately address residential remediation and land reclamation and provide the means to sustain reclamation efforts in BPSOU through perpetuity. Stream sediments are addressed under the *BPSOU Interim Site-Wide Surface Water Monitoring Quality Assurance Project Plan (QAPP) 2020 and 2021 Monitoring Period* (Atlantic Richfield Company, 2020a[1]). Sediment remnants will be evaluated using protocol provided in the Surface Water QAPP to determine whether COCs exist at concentrations above human health standards or if the site is impacted by historical mine waste and contributes to the degradation of surface water quality. Sediment remnants from snow storage sites and storm water structures will be evaluated using protocol provided in the Reclaimed Areas Maintenance and Monitoring (M&M) QAPP included as Appendix A.

Land reclamation has been, and will continue to be, a vital component of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) response actions implemented in and around the BPSOU. Land reclamation is ongoing and has been implemented on historical mining source areas, storm water conveyance systems, and/or residential areas.

This plan references the following associated documents as appendices:

Appendix A Reclaimed Areas M&M QAPP.
Appendix B Reclaimed Areas M&M Plan in Accordance with Butte Reclamation Evaluation System (BRES) (referred to herein as the Reclaimed Areas M&M Plan).

[1] Or the most current approved version. The Quality Assurance Project Plan is updated annually.

Appendix C BRES Field Manual.
Appendix D Unreclaimed Sites QAPP.
Appendix E Residential Metals Abatement Program (RMAP) QAPPs.
Appendix F Multi-Pathway RMAP Plan.
Appendix G Butte-Silver Bow (BSB) Snow Management Plan.
Appendix H RARUS Railway BPSOU Superfund Operations and Maintenance (O&M) Plan

1.1 Purpose

The purpose of this BPSOU Solid Media Management Program Plan is to describe and differentiate between programs and protocols established to identify, reclaim, monitor, and maintain areas associated with solid media contamination linked to historical mine waste within the BPSOU. This plan describes programs related to reclaimed upland areas, unreclaimed sites, residential programs, and riparian areas. Each individual program contains QAPPs, M&M plans, and work plans.

1.2 Background

As described in the EPA ROD (BPSOU CD), the BPSOU covers an area of approximately 5 square miles and is located several miles west of the continental divide at an elevation range of approximately 5,400 to 6,400 feet above mean sea level. The BPSOU encompasses the northwestern portion of the Summit Valley, which is characterized by gently sloping terrain, generally sloping toward the north in the southern portion of the valley and toward the west in the northern portion of the valley. The two primary streams in the valley are Blacktail Creek, which begins in the Highland Mountains to the south, and Silver Bow Creek below its confluence with Blacktail Creek. Silver Bow Creek flows west along the base of the Butte Hill and, prior to mining, originated in the mountains northeast of the BPSOU. With the advent of mining, Silver Bow Creek was rerouted, and the original channel and floodplain were consumed by the Berkeley Pit and the Yankee Doodle Tailings Pond. A storm drain and subdrain were constructed by realigning and filling the original channel of Silver Bow Creek above its confluence with Blacktail Creek, a low-lying swampy area, with numerous mine waste impoundments. Consequently, the surface channel of Silver Bow Creek above its confluence with Blacktail Creek (formerly known as the Metro Storm Drain[2]) is generally dry, except during

[2] A State of Montana District Court decision known as *Silver Bow Creek Headwaters Coalition v. State of Montana, DV-10-431 (*August 17, 2015) declared that the surface area between Texas Avenue in Butte to the confluence of Blacktail Creek with Silver Bow Creek was named "Silver Bow Creek." This area is now known and referred to here, geographically, as Silver Bow Creek above its confluence with Blacktail Creek. EPA called the surface area from Texas Avenue to the confluence with Blacktail Creek the "Metro Storm Drain" in prior Superfund removal and remedial documents and publications, including the 2006 BPSOU ROD and 2011 BPSOU ESD. Due to the Montana Department of Environmental Quality (DEQ) involvement in this document's issuance, and where reference to this specific section of Silver Bow Creek is necessary, further geographic descriptions, such as Silver Bow Creek "east" or "above" its confluence with Blacktail Creek is used in order for DEQ to comply with the Court's order. Reference to the area as "Silver Bow Creek" or "Silver Bow Creek east of its confluence with Blacktail Creek" is not and should not be construed as an admission or determination by any party on any procedural or substantive issue involving the area named Silver Bow Creek.

storm water runoff or snowmelt episodes. The primary source of flow into Silver Bow Creek is from Blacktail Creek.

Soon after Butte (Butte Area) was added to the Silver Bow Creek NPL and named a Superfund site, EPA recognized that arsenic- and lead-contaminated wastes within the populated urban area of Butte presented health risks. As a result, numerous response actions (Non-Time-Critical Removal Actions [NTCRAs] and Time-Critical Removal Actions [TCRAs]) were implemented beginning in 1988 and continuing through the Remedial Investigation / Feasibility Study (RI/FS) process leading up to the ROD, prior to the 2020 RODA (Appendix A of the BPSOU CD). Over 400 acres of land within the BPSOU were addressed through response actions prior to the ROD, and additional reclamation is ongoing. The RI/FS process determined that, in most cases, source controls, capping, and land reclamation techniques used during response actions to address contaminated solid media were consistent with the long-term remedial goals for the site and adopted most of the response actions as a portion of the remedy for contaminated solid media at the BPSOU. Areas reclaimed prior to establishment of the Butte Hill Revegetation Specifications (BHRS) (included in the ROD [BPSOU CD] as an appendix to the BRES) may be considered insufficiently reclaimed and eligible for reevaluation for reclamation enhancements using decision logic developed for solid media reclamation evaluation.

Reclamation in Butte evolved over time as factors controlling reclamation success were better understood and implementation practices improved. Response actions completed on mine-impacted lands within the BPSOU involved a variety of engineering applications, including storm water controls, caps over mine waste, and removals. The remedial investigation report identified 182 mining-related sites that have been impacted by or represent potential sources of arsenic and metal contaminants within the BPSOU (PRP Group, 2002). Most of these sites were addressed under EPA-authorized response actions prior to the ROD (BPSOU CD), and cap integrity and vegetation response within the BPSOU were inconsistent due in part to the variations in the procedures and practices implemented to reclaim these sites.

Recognizing the need to evaluate the stability, integrity, and degree of protection attained by reclamation, in 1992 EPA began formally evaluating these lands. Since then, EPA has conducted land reclamation assessments throughout the Clark Fork River Basin of Montana. The assessments brought about the need for a formalized tool that would allow evaluation personnel to determine whether sites were meeting the remedial goals and identify if additional corrective actions were necessary. The EPA-established requirements for such an assessment tool included the following:

- Establish soil and vegetation parameters critical to maintaining site stability, integrity, and overall protectiveness.
- Be easily and quickly applied in the field due to the large number of sites that need to be evaluated.
- Use a minimum amount of equipment.
- Be easily learned by new evaluators.
- Provide precise (i.e., reproducible) results when applied by different evaluators.

The BRES methodology was developed by EPA with input from the stakeholder technical group. In 2001, elements of the Draft BRES were calibrated and were later validated for implementation once the ROD (BPSOU CD) was issued. This process involved evaluating a select number of sites, identifying the level of training required for field personnel to obtain precise (i.e., reproducible) results, refining methods and procedures, and identifying relevant reclamation performance standards. The Calibration and Validation Report for BRES (CDM, 2003) describes that process in detail.

The resulting tool, the BRES, became the formalized assessment tool to evaluate compliance with reclamation performance standards within the urban upland environment in Butte. First proposed in a draft BRES document (CDM/RRU, 2000), the method was discussed at a public meeting of interested stakeholders in September 2000. EPA received written comments on the BRES from several entities including the Montana Department of Environmental Quality (DEQ), Atlantic Richfield Company (Atlantic Richfield), Big Butte Biologic Compost, Bighorn Environmental, BSB, the Citizens Technical Environmental Committee (CTEC), and the Natural Resource Conservation Service. EPA formally responded to those comments (CDM, 2001) and further refined the BRES for use within the BPSOU.

To accommodate the diverse land types and end land use within the BPSOU, the BRES is designed to address recreational/open space and commercial/industrial land uses within upland urban settings. Residential yards and playgrounds were specifically excluded from BRES and are addressed through the RMAP (BPSOU CD). Changes to the RMAP described under the 2020 RODA (Appendix A of the BPSOU CD) include geographic expansion of the Program boundary, schedule adjustment for residential properties outside of BPSOU, and consideration of contaminants and pathways at schools, playgrounds and play areas, and residential properties within commercial / industrial areas.

1.3 Regulatory, Removal, and Reclamation History

In 1991, EPA developed the Statement of Work for the BPSOU RI/FS (CDM, 1991), which contained two phases to be implemented concurrently. Phase I tasks focused on mine waste and contaminated soil within residential areas and in adjacent and upgradient contaminant source areas within the BPSOU where the potential for human health impacts from exposure to contaminants was greatest. Phase II focused on an evaluation of the characteristics and impacts of metals and arsenic contamination on Silver Bow Creek and on other source materials located outside of residential areas.

In 1994, the Montana Natural Resource Information System produced Map 94ARCO68. The map showed all the facilities and source areas that had been identified within the BPSOU by EPA, State Agencies, BSB, and other entities comprising the Primary Responsible Parties (PRP) Group. Map 94ARCO68 showed the reclamation status of the BPSOU (unreclaimed areas and areas where reclamation/removal activities had been completed) through 1993. This map served as the basis for further site characterization and reclamation work during the Phase II work.

In 1996, EPA approved the Final Phase II RI/FS Work Plan and Addendum for the BPSOU (PRP Group, 1996a), which included a plan to build on the soil/waste characterization and

removal reclamation work compiled for Map 94ARCO68. The goal was to fully characterize the BPSOU with respect to contaminated soil and waste material. To accomplish this goal, EPA, together with the State and the PRP Group, conducted a field survey of unreclaimed areas (FSUA) and a field survey of previously reclaimed areas (FSPRA).

The FSUA resulted in a site characterization of unreclaimed land within the BPSOU (outside of residential areas) and identified those source areas that exceeded arsenic and/or lead removal action levels for removal/reclamation. The FSUA integrated previously collected analytical data with new analytical data and observations to identify source areas that exceeded action-level lead and/or arsenic concentrations and areas that could potentially impact surface water quality through erosion and off-site sediment transport.

The FSPRA included reviewing previously reclaimed sites to evaluate all the facilities/source areas identified as reclaimed on Map 94ARCO68 to determine whether those sites were adequately reclaimed according to the Phase II work plan, which specified the following:

- Those facilities/source areas that are *adequately reclaimed* require only continued short-term operation and maintenance.
- Those facilities/source areas that are *inadequately reclaimed* require additional reclamation prior to reverting to long-term monitoring and corrective action as appropriate.

The FSPRA evaluated previously reclaimed sites according to protocol described in the *Field Survey of Previously Reclaimed Areas Site Inspection Protocol* (PRP Group, 1996b), but did not include final remedial action determinations for any site. The final remedial decisions regarding these areas were outlined in the ROD (BPSOU CD). Final summary documents for the FSUA and FSPRA were published in 1997 *Final Field Survey of Unreclaimed Areas Summary Report* (CDM, 1997) and *Technical Memorandum: Field Survey of Previously Reclaimed Areas* (PRP Group, 1997a).

The FSUA identified 27 unreclaimed sites with lead concentrations greater than the 2,300 milligrams per kilogram (mg/kg) non-residential action level and 32 sites with arsenic concentrations that exceeded the 500 mg/kg commercial action level for arsenic. Three of the sites that exceeded the commercial arsenic action level also exceeded the non-residential lead action level. The FSPRA evaluated the condition of 95 reclaimed areas in 1996 and 1997. Of those areas, 29 sites were identified as being inadequate with respect to the reclamation protocol and required further reclamation.

With the exception of 7 sites that were to be addressed under the Montana Economic Revitalization and Development Institute Program, the PRP Group reclaimed all the sites that were identified in the FSUA with lead concentrations above 2,300 mg/kg and the previously reclaimed sites identified for additional reclamation during the FSPRA. This work was conducted under two Response Action Work Plan Addenda projects: Previously Reclaimed Areas Operation and Maintenance (PRP Group, 1997b) and Previously Unreclaimed Areas (PRP Group, 1997c). Reclamation was completed according to the BHRS (BPSOU CD). The BPSOU

CD describes the Further Remedial Elements Scope of Work that defines additional remedial action required for the ROD implementation.

1.3.1 Solid Media Remedial Action Objectives

Solid media remedial action objectives (RAOs) were outlined in Section 8 of the ROD (BPSOU CD). The RAOs for solid media are to:

- *"Prevent the ingestion of, direct contact with, and the inhalation of, contaminated soils, indoor dust, waste rock, and/or tailings or other process waste that would result in an unacceptable risk to human health assuming current or reasonably anticipated future land uses.*
- *Prevent releases of contaminated solid media to the extent that they will not result in an unacceptable risk to aquatic environmental receptors.*
- *Prevent releases of contaminated water from solid media that would result in exceedances of the Montana State Water Quality Standards for surface water.*
- *Prevent releases of contaminated water from solid media that would result in exceedances of the Montana State Water Quality Standards for groundwater, except where ARAR* [applicable or relevant and appropriate requirements] *waivers are appropriate and other means to protect from associated risks are available.*
- *Remediate contaminated solid media to the extent that it will not result in an unacceptable risk to human health and/or aquatic environmental receptors.*
- *Prevent release of contaminated water from solid media that would result in degradation of surface water."*

Selected remedies for solid media are described in Section 12 of the ROD (BPSOU CD). The action levels and end use of these areas led to the establishment of various programs to achieve the remedy requirements. Section 2.0 (above) summarizes the different programs while Sections 3.0 through 6.0 (within this plan) describe the programs and data management in greater detail.

Specific programs were established to ensure solid media contamination is appropriately addressed and maintained to remain protective. Institutional controls (ICs), such as BSB ordinances and covenants, have also been established to ensure reclamation completed on residential properties remains protective and properly maintained (Section 2.5 within this plan). Reclamation completed on non-residential areas is maintained as described under Reclaimed Areas in Section 3.2 within this plan (and the Reclaimed Areas M&M QAPP in Appendix B), and routinely monitored as described under the BRES in Section 3.3 below (and BRES Field Manual in Appendix C). Non-residential suspected source areas will be evaluated as described in the Unreclaimed Areas in Section 4.0 in this plan (and in the Unreclaimed Sites QAPP in Appendix D) to determine the appropriate action required. Residential contamination is addressed under the RMAP in Section 5.0 in this plan (and in the RMAP QAPP [Residential Parcels] in Appendix E). Non-residential contamination including schools, day cares, parks, and play areas is addressed under the RMAP in Section 5.0 in this plan (and in the RMAP QAPP [Non-Residential Parcels] in Appendix E).

1.4 Program Schedule

The Settling Defendants (SDs) (Atlantic Richfield and BSB) will perform ongoing community outreach and engagement as described in the BPSOU Community Involvement Plan (EPA, 2021). Each program will perform program management activities ancillary to field activities, described below including but not limited to outreach, data management, database maintenance, and record keeping. SDs will perform such activities described within each specific program.

SDs are responsible to perform all reclamation and other associated response actions described in the BPSOU CD and further described in the specific solid media program presented in this plan. Annually, the SDs will perform monitoring, inspection, reclamation, and maintenance tasks as described within each specific program and provide appropriate reporting to the Agencies for review/comment or approval.

Field sampling and investigation of unreclaimed and insufficiently reclaimed sites began in 2021 and continues as weather permits, with a recurring schedule each year as applicable. Data summary reports and site declarations will be provided following field evaluations. As necessary, remedial design work plans will then be prepared and submitted for Agency review and approval.

Reclaimed areas will be monitored and maintained in perpetuity, or until reclamation monitoring is determined to no longer be necessary as concurred by SDs and the Agencies. Sites will be evaluated on a recurring four-year schedule. Monitoring and maintenance activities and schedules are further described in the appropriate program plans such as the Reclaimed Areas M&M Plan (Appendix B).

Residential contamination and abatement will be performed by the SDs as described in the RMAP 2020 UAO Amendment SOW. For residential properties within the BPSOU, BSB will make up to three attempts to perform assessments of all residential properties (including residential quarters within commercial/industrial properties) within the BPSOU within 10 years. All contaminated properties within the BPSOU are to be remediated in 20 years, except for those properties for which access cannot be obtained. In November of 2020, the 10- and 20-year timeframes began as goals for completion of these activities in the BPSOU. A change in property ownership will restart attempts to gain access until permission to sample the property is attained. Remediation may be conducted later, when and if access is obtained to that property for RMAP purposes in the future.

A fixed schedule or deadline has not been established for residential properties outside of the BPSOU but within the 2020 RMAP Area, properties used for outdoor residential or recreational purposes, and properties used as a school or dormitory. A target of 20 years is established for assessing these properties to coincide with completion of residential remediation within the BPSOU.

SDs will perform additional requirements described in the 2020 UAO Amendment SOW related to non-residential contamination including schools, day cares, parks, and play areas.

2.0 PROGRAM SUMMARIES

Remedial action and M&M plans maintained under the BPSOU Solid Media Management Program Plan are separated into multiple programs as described in the ROD (BPSOU CD). This section summarizes the programs. Sections 3.0 through 6.0 describe the programs and data management in greater detail.

Reclaimed and unreclaimed non-residential areas will be addressed as described in the BPSOU SOW and its Attachments B.1 and C and administered under the BPSOU CD.

The residential solid media contamination component of the ROD is not addressed in the BPSOU SOW or the BPSOU CD. Residential solid media contamination will be addressed under the RMAP (Residential Parcels) as described in the SOW (BPSOU CD) and implemented as described in the 2020 Amendment to Unilateral Administrative Order (UAO) Docket No. CERCLA-08-2011-0011 (EPA, 2020b).

2.1 Reclaimed Areas

Areas that have undergone reclamation activities to meet BHRS (BPSOU CD) are considered reclaimed areas (Figure 1). Reclaimed areas can be segregated into *reclaimed upland areas* and *reclaimed riparian areas*[3]. These areas must be periodically evaluated using the BRES to ensure remedial activities remain protective of the environment and human health.

Reclaimed upland areas are typically commercial/industrial or open space areas within the BPSOU that were reclaimed to meet BHRS (BPSOU CD). Reclaimed areas along the Silver Bow Creek above its confluence with Blacktail Creek and Lower Area One (LAO) floodplain or riparian areas along Silver Bow Creek above its confluence with Blacktail Creek and Silver Bow Creek below its confluence with Blacktail Creek may include a reclamation cap over waste in place. These reclaimed riparian areas that have been engineered for soil stabilization require routine monitoring, evaluation, and maintenance to ensure the cap remains protective. An evaluation system similar to the BRES will be developed specifically for vegetation along riparian and floodplain areas.

2.2 Unreclaimed Areas

The primary source areas containing historical mine waste have been reclaimed under previous response actions. However, additional unreclaimed source areas have been identified that may require remedial action. If necessary, reclamation of these areas will be completed under this Solid Media Management Program Plan to ensure long-term protectiveness of human health and the environment throughout the BPSOU.

Remaining unreclaimed sites on the Butte Hill (Figure 1) will be evaluated according to Appendix D, Attachment C to the BPSOU CD, Further Remedial Elements Scope of Work.

[3] Riparian area evaluation methodology will be included in the Solid Media Program upon completion of remedial action and establishment of the evaluation system.

Evaluations will follow the logic diagram (Unreclaimed Area Decision Logic) provided in the Unreclaimed Sites QAPP (Appendix D). Site-specific field sampling plans will be developed by the SDs and approved by the Agencies and will describe sampling activities and protocols according to the Unreclaimed Sites QAPP (Appendix D). Site declarations will be prepared, as appropriate, based on analytical results. Sites declared to exceed solid media action levels will be reclaimed as described in remedial action work plans (RAWPs) prepared by SDs and approved by Agencies prior to implementation.

Action levels for human health contaminants and contaminant criteria for impacts to surface water are provided as Tables 1 and 2, respectively, in the Unreclaimed Sites QAPP (Appendix D). Areas determined to be impacted by historical mine waste presenting a risk to human health or surface water will be reclaimed in accordance with BHRS. Reclamation may include revegetation, capping (engineered or vegetative), or implementation of storm water controls at the unreclaimed site. Following reclamation, vegetative or engineered caps will be evaluated according to the BRES Field Manual (Appendix C) and be managed according to the Reclaimed Areas M&M Plan (Appendix B). Additional storm water structures will be incorporated into the Interim O&M Plan for Superfund Storm Water System within BPSOU (Atlantic Richfield Company, 2018) as appropriate. Storm water structures not associated with Superfund will be incorporated into the BSB municipal storm water program.

2.3 Residential Metals Abatement Program

The first programmatic iteration initiated in 2006 as prescribed in the ROD (BPSOU CD), the BSB Lead Intervention and Abatement Program (now the RMAP), administered by the BSB Health Department, was initially tasked with addressing targeted homes and residential properties. The RMAP, was administered by the BSB Superfund Division until 2020 and is now administered by the Department of Reclamation and Environmental Services, Human Health/RMAP Division. The RMAP was designed to mitigate residential exposure to potentially harmful sources of lead, arsenic, and mercury contamination in the BPSOU and certain adjacent areas (Figure 2). The RMAP initially required sampling residential yard soil, interior living space dust, attic dust, and lead-based paint within the BPSOU.

The 2006 ROD (BPSOU CD) required residential areas with concentration levels above the soil, dust, or vapor action levels listed in Table 12-1 (of the 2006 ROD) be remediated if a pathway exists for human exposure in yards or indoor dust in living spaces. The program was expanded in 2011 to include certain areas adjacent to the BPSOU and ensure all residential properties within the BPSOU be sampled, assessed, and abated if referenced action levels are exceeded. The 2020 RODA (Appendix A of the BPSOU CD), executed under the 2020 UAO Amendment to UAO Docket No. CERCLA-08-2011-0011 (EPA, 2020b), again modified the program to include a geographic expansion of the program boundary and include schools, parks and play areas, and development of modified sampling protocols to ensure sources of contamination are identified and addressed accordingly. The program continues to mitigate exposure to potentially harmful sources of lead and arsenic contamination. Additional modifications to the program are under consideration at the time of this document submittal.

2.3.1 RMAP (Non-Residential Parcels)

RMAP sampling and analyses of non-residential properties (i.e., schools, parks, and non-residential daycares) are anticipated to be a one-time event lead by Atlantic Richfield. The RMAP QAPP (Non-Residential Parcels) describes the quality assurance/quality control (QA/QC) policies and procedures to be used during these efforts. Specific QAPPs described in Section 5.1 will be prepared to describe the specific requirements of non-residential interior dust and soil sampling.

2.4 Reclaimed Riparian Areas

A reclaimed riparian area assessment plan has yet to be developed for the BPSOU. Development of this plan and associated protocols is expected to be completed during the remedial design phase of the further remedial elements. This Solid Media Management Program Plan will be amended as necessary to reflect changes associated with riparian areas.

2.5 Institutional Controls

The BPSOU ICs are described in the BPSOU *Institutional Controls Implementation and Assurance Plan* (ICIAP) (Atlantic Richfield Company/BSB, 2019). The ICs include non-engineered controls, such as government controls (BSB ordinances and access controls), proprietary controls (access agreements and restrictive covenants), and informational devices. Institutional controls help to minimize the potential for exposure to contamination and/or protect the integrity of a response action. BSB zoning and permit requirements have been implemented to ensure reclaimed areas and their reclamation caps are not disturbed, mismanaged, or inappropriately developed. Permits are also established to ensure any disturbed mine waste or mine waste permanently removed is transported to the Mine Waste Repository and disposed appropriately.

Deed notices and covenants are required for all areas owned/controlled by non-PRP entities where contamination was left in place and capped. These notices will inform current and subsequent landowners of site conditions and associated land use restrictions. Site access agreements will also be secured to ensure appropriate M&M tasks can be performed on privately owned reclaimed areas. Access agreements will allow routine BRES evaluations to identify issues and complete corrective actions to address identified deficiencies.

A universal database and map of all reclaimed/BRES sites, including active railroads, will be prepared in the future by the SDs for management purposes. Responsible parties will be identified within the database.

2.6 Street Maintenance and Snow Management Plan

For specific primary and secondary routes within the BPSOU, BSB is responsible for conducting street and snow maintenance activities. Typical street and snow management activities include the following:

- Street Sweeping and Flushing.
- Sand Application.
- Deicer Application.
- Sand Source Sampling.
- Snow Storage.
- Snow Removal.

The BSB Street/Snow Maintenance Plan (Appendix G) was developed by BSB pursuant to a requirement by EPA as part of a 2011 UAO (BPSOU CD). Implemented by BSB, the plan focuses on activities that could result in potentially contaminated sediment being delivered to BPSOU surface waters. The plan helps to ensure that environmental impacts from street and snow maintenance activities are minimized and appropriate administrative and structural Best Management Practices (BMPs) are applied. Snow storage areas, shown on Figure 3, are used to stockpile snow removed from streets.

Annual site inspections will be conducted each spring (post-snowmelt) to monitor the effectiveness of site BMPs and discharge points (if any). Additional BMPs will be developed and implemented, if necessary, to prevent sediment from entering the storm water system.

All roadway sand must meet acceptance criteria consistent with the BHRS and BPSOU reclaimed areas. Testing protocol described in the Reclaimed Areas M&M QAPP (Appendix A) will be used to determine acceptability of all roadway sand to ensure waste-impacted materials are not used on roadways. During the annual inspection, BSB will obtain samples from the snow pile remnants following the protocol described in the Unreclaimed Sites QAPP (Appendix D) within the BPSOU and submit them for analysis to determine the metal results and verify acceptability prior to disposing of the snow pile remnant sediment. Sediment remnants sample results will be used to determine whether COCs exist at concentrations above human health standards or if the site condition contributes to the degradation of surface water quality. Materials above action levels will be transported to the Mine Waste Repository.

2.7 Properties with Incompatible Uses

Within the BPSOU, there are instances of usage or activities on properties that are incompatible with an RMAP remedy or the BRES reclaimed caps over mine waste or soil with elevated metals. Known examples include pasturing of animals on or near reclaimed areas and/or industrial activities that compromise cap integrity. These cases will be referred to EPA/DEQ and handled on a case-by-case basis as each situation is unique.

Follow-on actions by EPA/DEQ include additional phone contacts, certified mailings, setting up a private meeting with the landowner, and, if necessary, legal action to obtain access and/or improve site conditions consistent with maintaining the remedy. BSB will monitor future changes in ownership annually; if ownership changes, EPA/DEQ will be notified and will renew steps, as necessary, to address the incompatible activities.

2.8 RARUS Railway Properties

Within BPSOU, historical railroad beds were commonly constructed using mining-related waste and/or contaminated by spillage during transport of ore or ore concentrates. The RARUS active rail lines and yards within BPSOU were formerly owned and operated by Atlantic Richfield[4]. The SDs identified in the CD are responsible for implementing the monitoring and maintenance described in Attachment B.1 of Appendix D, at section 2.4 of the 2020 RODA (EPA, 2020). Human health and environmental risks associated with elevated metals in and around railroad beds within the BPSOU were addressed under TCRAs (Atlantic Richfield Company, 2003). These actions also included significant storm water drainage improvements. Analytical soil testing of soil bed material indicated certain areas exhibited lead and arsenic concentrations that exceeded action levels for non-residential areas described in Table 12-2 of the 2006 ROD (EPA, 2006). Past, current, and future RAs have removed and/or stabilized the mining-related materials that were or may be located on RARUS property. The RARUS Main Line railroad extends westward from Middle Yard at Wyoming Street to the western boundary of the BPSOU. As part of the remedial action (RA), some materials containing elevated COCs remain in place under the final remedy. The RARUS Railway BPSOU Superfund Operations and Maintenance (O&M) Plan (Atlantic Richfield Company, 2020b) was prepared to inspect and maintain specific RA sites (covers, surface water conveyance structures, and other superfund components that reduce COC migration) on lands and railroad lines owned by RARUS Railway, LLC within the BPSOU.

[4] The railroad was initially constructed in the 1890s as the Butte, Anaconda and Pacific (BA&P) Railway financed by the interests behind the Anaconda Copper Mining Company and operated primarily to carry copper ore from the mines in Butte to the smelters in Anaconda, Montana. On January 12, 1977, Atlantic Richfield Company purchased Anaconda Copper Mining Company. The BA&P operated from 1893 to 1985.

The BA&P property was transferred to the State of Montana in 1985. RARUS Railway took over the BA&P on May 1, 1985, and it was subsequently purchased by RARUS from the State in 1990. Patriot Rail acquired RARUS Railway in 2006. In May 2007, Patriot Rail purchased the RARUS Railway. In July 2007, its name was changed back to Butte, Anaconda & Pacific Railway.

3.0 RECLAIMED AREAS

Areas that have undergone reclamation activities to meet BHRS (BPSOU CD) are considered reclaimed areas. These areas must be periodically evaluated to ensure remedial activities remain protective of the environment and human health. The BRES is recognized as the tool that establishes detailed methodology used to evaluate the stability, integrity, and degree of protectiveness of all reclaimed land, soil cover caps, or other forms of engineered caps covering mine-waste material left in place at the BPSOU.

3.1 Reclaimed Areas Maintenance and Monitoring Quality Assurance Project Plan

The Reclaimed Areas M&M QAPP (Appendix A) provides guidance for M&M activities and limited sampling and analyses and describes the QA/QC policies and procedures that will be implemented during routine data collection and analyses specific to evaluations and maintenance of reclaimed areas. The QAPP includes the following key elements:

- Program management and objectives.
- Measurement and data acquisition.
- Assessment and oversight.
- Data review and usability.

3.2 Reclaimed Areas Maintenance and Monitoring Plan

Reclaimed areas must be monitored, evaluated, and maintained to achieve BRES performance standards (BPSOU CD). The Reclaimed Areas M&M Plan (Appendix B) describes periodic, routine inspection and maintenance activities required to ensure remedial performance standards are achieved and waste remains capped in place.

3.3 Butte Reclamation Evaluation System

The BRES (BPSOU CD) is a formalized assessment tool to evaluate the stability, integrity, and protectiveness of reclamation over the long term to protect human health and the environment. The BRES Field Manual (Appendix C) provides the means to determine if reclaimed lands are achieving the performance standards consistent with remedial objectives. As specified in the ROD (BPSOU CD), the BRES sets the performance standard that all reclaimed areas in the BPSOU must achieve and sets forth the methodology for evaluating these reclaimed areas. The Reclaimed Areas M&M Plan (Appendix B) provides guidelines for completing corrective actions and reporting.

Within the BPSOU, constructing vegetative or engineered caps over impacted areas is the primary response action to eliminate exposure to contaminated mine waste. Vegetative caps may include stabilization media, cover soil, specific growth, and vegetation media. Engineered caps may include concrete, asphalt, or xeriscaping. The caps must be monitored and maintained to ensure the cap does not erode, which could lead to COCs being transported off a site either by water or wind.

The BRES is specifically designed for use in the upland environment in Butte, Montana. The methodology accommodates the diverse land types and end land uses within the BPSOU and is designed for evaluation of open space/recreational and commercial/industrial reclaimed areas within an urban setting.

The BRES was successfully applied on remediated sites in the BPSOU between 2007 and 2012 based on the validation and calibration effort; in 2014, the BRES was further optimized to simplify the pre-assessment preparation process and enhance data quality objectives. Tools were developed to allow more precise collection and storage of spatial and quantitative data in the field. A language database (using SQL) was developed to facilitate collection and storage of evaluation data from the field and allow quality checks from a computer in an office. At the same time, Esri ArcGIS Online was deployed to make historical spatial data available to evaluators via hand-held digital tablets. The Esri Collector for ArcGIS and Esri Survey 123 tablet applications provide the functionality of Esri ArcMap in the field and provide a mechanism for evaluators to identify and map BRES site features with precision.

3.3.1 Butte Hill Revegetation Specifications

The 1997 primary seed mixture was proposed by BSB based on their monitoring results for successful revegetation within the Butte area. The BHRS, included in the BRES, set the vegetative specifications for reclaimed areas on the Butte Hill. The BHRS includes limestone stabilization, cover soil acceptance specifications, amendment, fertilizer, and seeding application rates. Revegetation seed mixtures have changed from the inception of the BHRS to better suit native vegetation within the BPSOU. The original BHRS included a primary seed mixture and application rates suitable to establish vegetation in general reclaimed areas. Alternative seed mixes and application rates were established as revegetation mixes for specific types of vegetative areas, including gently sloped areas and grass-lined ditches. Additional alterations were made to the BHRS seed mixture at the recommendation of a reclamation vegetative specialist and were approved by the Agencies. Availability of seed will be evaluated annually. Alterations to the seed mixture will be provided to the Agencies for review and approval.

Seed Application Areas/Rates – Approved Butte Hill Primary General Seed Revegetation mixtures include the following:

Pal Mixture, 2020		
Common Name	**Species**	**lbs PLS/Acre**
Bluebunch wheatgrass	*Pseudoroegneria spicata*	11.1
Idaho fescue	*Festuca idahoensis*	3.6
Western wheatgrass	*Pascopyrum smithii*	3.6
Prairie junegrass	*Koeleria macrantha*	0.2
Sandberg bluegrass	*Poa sandbergii*	0.5
Quick guard (sterile triticale)	*Triticale*	5.8
Blue flax	*Linum lewisii*	0.2
Rubber rabbitbrush	*Ericameria nauseosa*	0.1
	Total	**24.9**

lbs: pound. PLS: pure live seed.

Pal Mixture, 2017		
Common Name	**Species**	**lbs PLS/Acre**
Bluebunch wheatgrass	*Pseudoroegneria spicata*	11.12
Idaho fescue	*Festuca idahoensis*	2.7
Prairie junegrass	*Koeleria macrantha*	0.08
Sandberg bluegrass	*Poa sandbergii*	0.28
Western wheatgrass	*Pascopyrum smithii*	3.96
Perennial Lupine	*Lupinus perennis*	5.33
Rocky Mountain Beeplant	*Cleome serrulata*	0.66
Canada Milkvetch	*Astragalus canadensis*	0.48
Common Sunflower	*Helianthus annuus*	0.73
Blanketflower	*Gaillardia aristata*	0.2
Blue flax	*Linum lewisii*	0.19
Mountain Big Sage	*Artemesia tridentata*	0.03
Rubber rabbitbrush	*Ericameria nauseosa*	0.13
	Total	**25.9**

lbs: pound. PLS: pure live seed.

Pal Mixture, 2015		
Seed Mixture	**Rate**	
Bluebunch Wheatgrass	11.12	PLS/acre
Idaho Fescue	3.58	PLS/acre
Rouch Fescue	1.96	PLS/acre
Prairie Junegrass	0.17	PLS/acre
Sandberg Bluegrass	0.47	PLS/acre
Quick Guard (Sterile Triticale)	5.76	PLS/acre
Blue Flax	0.19	PLS/acre
Rubber Rabbitbrush	0.06	PLS/acre
Total	23.3	PLS/acre

PLS: pure live seed.

Alternate Seed Mixture No. 1 - Gentle Sloped Areas (Less than 10:1)
Revegetation Mix

Seed Mixture	Rate, #PLS/Acre	Planting
Bozoisky Russian Wildrye	5.0	Initial seeding, drill seeded on 15-to-18-inch centers.
Ladak Alfalfa	2.0	Inter-seeded during following years as determined by vegetation monitoring.
Total	**7.0**	PLS/acre.

PLS: pure live seed.

Alternate Seed Mixture No. 2 B Grass-lined Ditches

Seed Mixture	Rate, #PLS/Acre
Smooth Broughm	5.0
Birdsfoot Trefoil	1.0
Red Clover	0.5

PLS: pure live seed.

Alternate Seed Mixture No. 3 – General Seed Mixture

Common Seed Name	Rate	
Bluebunch wheatgrass	11.12	PLS/acre
Idaho fescue	2.71	PLS/acre
Rough fescue	0.87	PLS/acre
Prairie junegrass	0.08	PLS/acre
Sandberg bluegrass	0.28	PLS/acre
Western wheatgrass	3.96	PLS/acre
Quick guard (sterile triticale)	5.76	PLS/acre
Silky lupine	5.33	PLS/acre
Canada milkvetch	0.48	PLS/acre
Rocky Mountain Beeplant	0.66	PLS/acre
Common sunflower	0.73	PLS/acre
Blanket flower	0.20	PLS/acre
Fuzzy-tongue Penstemon*	0.12	PLS/acre
Blue flax	0.19	PLS/acre
Big sage brush	0.03	PLS/acre
Rubber rabbitbrush	0.13	PLS/acre
Grand Totals	**32.6**	PLS/acre

*Fuzzy-tongue Penstemon only used in fall (after October 15) seeding applications.
PLS: pure live seed.

Pure live seed application rates will be as specified in the tables.

The 2015 primary seed mixture was proposed by BSB in collaboration with a Montana Tech native species vegetation specialist. The mixture is based on monitoring results for successful revegetation within the Butte area and has been reviewed and approved by BSB, EPA, and the State for use in upland areas of the BPSOU. Alterations to the 2015 seed mixture were made primarily due to availability of certain seed species and suitable replacements made in consultation with subject matter experts and the Agencies.

The Alternate Seed Mixture No. 1 will only be used in areas with slopes of less than 10 horizontal:1vertical that are particularly susceptible to weed infestation. Additional optimal conditions for using the alternative seed mix include locations with high moisture holding capacity and shelter from strong wind conditions. The Alternate Seed Mixture No. 2 proposed by BSB is an option for hand seeding grass-lined ditches and detention basins.

Calculations of pure live seed may be made based on either a germination test or a tetrazolium test in addition to the purity analysis. Seed will be applied on a pure “live seed” basis. The quantity of pure “live seed” in a 100-pound container will be determined by the formula 100 multiplied by germination percentage, and this product multiplied by the purity percentage. For example, if the seed is 85 percent pure and tests 90 percent germination, then a 100-pound container would contain 76.5 pounds of pure “live seed.”

3.4 Reclaimed Riparian Areas[5]

Between 1992 and 1997, EPA conducted an Expedited Response Action (ERA) at LAO (a reclaimed riparian area) that included removing mill tailings and manganese stockpiles and importing backfill material and revegetation. A groundwater collection and treatment system was also constructed as part of the LAO response action.

The approach to reclamation at LAO differed significantly from that applied to the uplands in Butte. In LAO, waste material was excavated in and around Silver Bow Creek to a specified design contour interval and cover soil was brought in to replace the contaminated soil. The only waste remaining in LAO is located under the slag walls and water treatment plant, or at significant depth (greater than 8 to 10 feet). In contrast, upland BPSOU response action areas have waste left in place. For LAO, the concerns are managing and treating contaminated groundwater, maintaining the integrity of the reconstructed stream channel, and preventing potential downcutting of the channel in flood events that may expose deeply buried mine waste material.

[5] The BRES Field Manual and reclaimed area documents will be updated or appended following construction, completion of the Key Remedial Elements Construction Completion Report or KRECCR, and entry from remedial action to the Compliance Determination Period.

4.0 UNRECLAIMED AREAS

Unreclaimed areas on Butte Hill that are known to be impacted by historical mining will be sampled and evaluated to determine whether COCs exist at concentrations above human health standards, or if the site condition contributes to the degradation of surface water quality. If a site is determined to meet these criteria, reclamation will be performed, which may include revegetation, capping, or implementation of storm water controls at the unreclaimed site. Means and methods used to characterize unreclaimed sites and make remediation recommendations are described in the Unreclaimed Sites QAPP (Appendix D). Sites where reclamation took place prior to the establishment of the BHRS (BPSOU CD) are identified as insufficiently reclaimed sites. These sites may require additional sampling/inspection to determine if further reclamation is required. Specific actions to be implemented will be determined during remedial design to ensure the final reclamation is completed to meet BHRS. Site-specific field sampling plans developed by the SDs and approved by the Agencies will describe sampling activities and protocols according to the appropriate approved QAPP (Appendix D). Results from site sampling/inspection activities will drive remedial action requirements to be completed by the SDs. The RAWPs will be prepared by SDs and approved by Agencies prior to implementation.

Source areas within the BPSOU may include upland soil and mine waste, railroad beds, and floodplain soil and waste. These source areas have the potential to act as indirect pathways for human exposure, metals inputs to alluvial and bedrock aquifers, and metals sources to Blacktail Creek and Silver Bow Creek via storm water runoff. Although many source areas have been previously remediated, areas where soil has not yet been well characterized still exist. Areas classified as unreclaimed will undergo further characterization to determine if future remediation efforts are warranted. 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 BHRS (BPSOU CD).

Upon completion of reclamation to BHRS requirements, a reclaimed area boundary will be established, and the area will be transferred to long-term maintenance and evaluation under the BRES and managed according to the Reclaimed Areas M&M Plan (Appendix B).

4.1 Unreclaimed Sites Quality Assurance Project Plan

The Unreclaimed Sites QAPP (Appendix D) describes the activities necessary to conduct soil sampling activities at the unreclaimed non-residential sites. It also describes the QA/QC policies and procedures to be used during sample collection and analysis. The QAPP standardizes the sampling process to provide accurate and defensible testing results to characterize individual sites and provide declarations if future remediation is warranted.

4.2 Unreclaimed Sites Field Sampling Plans

Site-specific field sampling plans will be prepared for unreclaimed non-residential sites identified for further evaluation as previously described. Site-specific plans will reference means and methods provided in the Unreclaimed Sites QAPP (Appendix D), and the plans will include

specific site maps, proposed sample locations and frequencies, and work schedules. A revision summary will be added to the Unreclaimed Sites QAPP as an appendix on an annual basis.

4.3 Solid Media Reclamation Action Levels

Solid media reclamation action levels and screening levels for unreclaimed sites provide threshold values for possible remediation or additional investigation. EPA previously selected action levels for arsenic and lead for open space/industrial areas listed in Table D-1 of the 2006 ROD (EPA, 2006) and these levels are listed in the Field Screening Criteria and Procedures for Streamside Tailings OU (Pioneer, 2011), which apply to the unreclaimed sites. The screening levels for cadmium, copper, and zinc will be referenced for possible future remediation efforts.

4.4 Solid Media Logic Diagrams

Solid media logic diagrams were developed with the implementation of the BRES to help determine trigger items. An unreclaimed site evaluation logic diagram was also developed to assist with decisions regarding whether further evaluation of sites is warranted and if soil samples should be collected. The diagram (Unreclaimed Area Decision Logic) is included in the Unreclaimed Sites QAPP (Appendix D).

5.0 RESIDENTIAL METALS ABATEMENT PROGRAM

The RMAP is designed to mitigate exposure to potentially harmful sources of lead, arsenic, and mercury contamination within the BPSOU and the expanded area described in the 2020 RODA (Appendix A of the BPSOU CD) and implemented under the 2020 RMAP Amendment to UAO Docket No. CERCLA-08-2011-0011 (EPA, 2020b). The geographic extent of the RMAP was expanded. The Expanded Area encompasses the urban corridor of BSB and includes the 2006 ROD Adjacent Area and the 2011 ESD (BPSOU CD) attic expansion area. The 2020 RMAP boundary was expanded per the 2020 RODA to encompass the BPSOU; areas within the West Side Soils OU (WSSOU)[6]; and the urban corridor of the City and County of BSB.

Contamination may originate from both mining-related (waste rock, tailings, or aerial emissions) and non-mining-related sources (lead-based paint and lead solder) of lead. The potential sources of lead, arsenic, and/or mercury exposure addressed by RMAP include yard soil, interior living space dust, and attic dust when exposure pathways are identified. Although the areas outside of the BPSOU are not historically associated with mining or smelting waste dumps, exposure pathways associated with attic dust may exist. In addition to removing/abating the contaminant source, the RMAP uses community awareness and education in conjunction with medical monitoring to supplement and ensure its effectiveness.

A multi-pathway approach is implemented to address both mining and non-mining-related lead, arsenic, and mercury contamination at all residential properties that exceed action levels within the 2020 RMAP boundary, which includes the BPSOU site and the Adjacent Area. BSB staff use a prioritized approach to address effected and sensitive populations expeditiously. The 2011 ESD (BPSOU CD) modified the time allotted for assessment and abatement of all residential properties within the BPSOU. The 2011 ESD required 3 attempts to perform assessments of all residential yards within the BPSOU to occur in 10 years and all contaminated residential yards within the BPSOU to be remediated in 20 years, except for those properties for which access cannot be obtained. On November 16, 2020, the 10- and 20-year timeframes began as goals for completion of these activities in the BPSOU. The assessment and remediation of properties outside of the BPSOU and within the 2020 RMAP boundary are not subject to these 10- and 20-year timeframes. Properties outside the BPSOU boundary but within the RMAP expansion area will be sampled by request only.

The RMAP (Residential Parcels)-supported sampling is conducted on residential yard soil, interior living space dust, attic dust, and lead-based painted items within the BPSOU. Such properties with yard soil or interior living space dust with concentrations exceeding solid media action levels or indoor air with levels exceeding the mercury vapor action level will be remediated. Mercury vapor monitoring may be performed if any soil, interior dust, or attic dust exceeds residential action levels for mercury. If attic dust samples exceed the action level and an

[6] The boundary of the West Side Soils Operable Unit (WSSOU) is currently undefined. Remedial investigation of areas outside of the BPSOU has been initiated by EPA and by the Potentially Responsible Party, Atlantic Richfield, in accordance with the Unilateral Administrative Order for Remedial Investigation Data Collection for the West Side Soils Operable Unit (OU 13) of the Silver Bow Creek / Butte Area Superfund Site (EPA, 2019). These remedial investigation activities are expected to inform future definition of the WSSOU boundary.

exposure pathway exists between the attic and living space, the attic will be remediated. If both living space and attic dust samples exceed the action levels, a pathway will be assumed, and the attic will be remediated.

The RMAP also includes a process to determine when water samples should be collected and analyzed to determine the presence of lead in drinking water if a home has lead pipes and/or lead solder that may be contributing to an unacceptable exposure. Details on sampling and analysis procedures and requirements are provided in the RMAP QAPP (Residential Parcels) (Appendix E.1).

The ROD, as modified by the ESD (BPSOU CD), also requires that the RMAP address operation and maintenance issues and administer the attic dust component. Since the RMAP does not clean the attic dust unless there is an established pathway of exposure, there is another requirement to track these properties over the long term to assess and remove attic dust when a pathway emerges or to assess and abate attic dust problems when a potential exposure arises.

The RMAP was again expanded in accordance with the 2020 RODA (Appendix A to the BPSOU CD) and the 2020 UAO Amendment (EPA, 2020b). The RMAP boundary described in the 2020 RODA was expanded to encompass the urban corridor of BSB and includes the 2006 ROD (BPSOU CD) Adjacent Area and the 2011 ESD (BPSOU CD) attic expansion area. The RMAP now addresses contaminants and pathways at schools, playgrounds and play areas, and residential properties within a commercial/industrial area. Sampling outside the BPSOU within the Expanded Area will be completed at the request of property owners (“by request”).

5.1 RMAP Quality Assurance Project Plans

Multiple quality assurance project plans were developed to support specific sampling efforts conducted under the RMAP. The RMAP QAPPs (Appendix E) contain sampling and analysis guidelines and QA/QC policies and procedures to be used during data collection and analyses specific to RMAP. The key elements of the RMAP QAPPs are Program Management objectives, sampling and data acquisition, field assessment and oversight, and data usability. Development of additional QAPPs will be included in subsequent updates to this document. Each specific QAPP is described below.

5.1.1 RMAP QAPP (Residential Parcels)

The RMAP QAPP (Residential Parcels) (Appendix E.1) describes management and administrative functions as well as background, objectives, and documentation requirements for sampling and analysis activities performed at residential areas located in the Program area. BSB Reclamation and Environmental Services implements this program to mitigate potential harmful exposure of residents to lead, arsenic, and mercury from both mining-related (i.e., waste rock, tailings, and aerial emissions) and non-mining (i.e., lead paint, lead pipes, and lead solder) sources.

5.1.2 RMAP QAPP (Non-Residential Parcels)

The RMAP QAPP (Non-Residential Parcels) (Appendix E.2) contains sampling and analysis guidelines and QA/QC policies and procedures to be used for data collection activities at schools, day cares, parks, and play areas located in the Program area. Atlantic Richfield implements this program through coordination with BSB Reclamation and Environmental Services to evaluate residential soils at schools, designated park playgrounds, and daycares.

5.1.3 RMAP QAPP (Non-Residential Parcels – Interior Dust)

The RMAP QAPP (Non-Residential Parcels – Interior Dust) (Appendix E.3) contains sampling and analysis guidelines and QA/QC policies and procedures to be used during data collection and analyses specific to sampling performed to measure concentrations of COCs in dust in representative accessible areas within the schools and daycares located in the Program area. Atlantic Richfield implements this program through coordination with BSB Reclamation and Environmental Services to perform interior assessments and sampling of interior dust in non-residential schools, preschools, and non-residential daycares.

5.2 RMAP Program Plan

The *Multi-Pathway RMAP Plan* (RMAP Program Plan) included in Appendix F is designed to mitigate exposure of residents of the BPSOU to sources of lead, arsenic, and mercury contamination. The RMAP Program Plan is implemented by BSB through funding provided by Atlantic Richfield. It addresses both contaminant sources (mining- and non-mining-related) and exposure pathways. Residential homes and yards and other living spaces that are found to have contaminant sources that present a human health risk (i.e., are above action levels) are

remediated. It also addresses contaminants and pathways at schools, playgrounds and play areas, and residential properties within a commercial/industrial area.

The RMAP Program Plan (Appendix F) describes the plan components, eligibility, sampling requirements and scheduling, data management, community outreach and education, and abatement and remediation elements. The RMAP Program Plan is used in conjunction with the RMAP QAPP (Appendix E) to ensure RMAP objectives are met and residential, schools, playgrounds and play areas sampling results and remediation activities are appropriately recorded.

6.0 BSB STREET AND SNOW MANAGEMENT PLAN

Per the 2011 UAO, the BSB Street/Snow Maintenance Plan (Appendix G) was prepared to focus on activities that could result in potentially contaminated sediment being delivered to area receiving waters. This plan is implemented by BSB to ensure that environmental impacts from street and snow maintenance activities are minimized, and appropriate administrative and structural BMPs are implemented.

The BSB Street/Snow Maintenance Plan describes street maintenance, snow removal, snow storage locations and related sampling activities, inspection and maintenance, coordination, and training requirements.

7.0 RARUS RAILWAY OPERATIONS AND MAINTENANCE PLAN

The Rarus Railway O&M Plan (Appendix H) describes operations, monitoring, and maintenance activities, listed below, to comply with EPA-identified CERCLA performance standards.

- Identify the locations associated with active lines that require monitoring and maintenance under CERCLA.
- Provide specific guidelines for inspection, operation, and maintenance activities to be performed under CERCLA to maintain the RAs (engineered industrial covers such as ballast rock or other aggregate materials, surface water conveyance structures, and crossings) completed on active RARUS railroad lines within the BPSOU.
- Identify and monitor RARUS property locations located more than 25 feet from active lines that require monitoring and maintenance under CERCLA (primarily within the Mainline and Middle Yard) shown in Figure 2-2 of the ROD (EPA, 2006).
- Identify the schedule of inspections and periodic maintenance.
- Identify reporting requirements and procedures for record-keeping purposes.

Related inspections are recorded using the BPSOU Site Inspection Forms provided within the O&M Plan.

8.0 DATA MANAGEMENT

Data management of solid media programs will be completed as described in the *BPSOU Data Management Plan* (Atlantic Richfield Company, 2017). Components of the referenced data management plan are provided below.

8.1 BPSOU Soils Database

The BPSOU soils database is the electronic data repository used to store all data related to BPSOU soils. The BPSOU soils database is used to store data regarding characterization of solid media, unreclaimed areas, and some reclaimed areas. This information may include, but will not be limited to, the following:

- Location coordinates.
- Date and sampler(s).
- Soil analytical data:
  - Source areas.
  - Railroads.
  - Stream beds.
  - Cover soil sources.
- Sampling results (COC concentrations):
  - arsenic, cadmium, copper, lead, and zinc.

The soils database will be integrated with the reclamation database maintained by BSB. As discussed in Section 2.5, a universal database and map of all reclaimed/BRES sites, including active railroads, will be prepared.

8.2 Reclamation Database

The BPSOU reclamation database is the electronic data repository used to store all reclamation data related to source areas reclaimed and evaluated according to BRES. The data collection and management system was initiated in 2007 and is maintained by BSB. This database may include, but will not be limited to, the following:

- Remediation response action history.
- BRES annual field evaluations.
- A subset of the reclamation database includes soil sampling:
  - Sample location provided in coordinates.
  - Sample collection date and sampler(s).
  - Sampling results (COC concentrations).
  - Soil analytical data.
  - Specified source area boundaries.
  - Railroads (Butte-Anaconda and Pacific [BA&P] TCRA).
  - Stream beds.
  - Cover soil sources.
- Vegetation information: species observed, weeds, and percent vegetation cover (method, observer, year).
- Remedial action as-built information.
- Summary of completed annual maintenance activities.

8.3 RMAP Database

The dedicated RMAP database[7] is separate from the soils database and is used to store data specific to the RMAP program. The RMAP database is the electronic data repository used to store all data related to the residential programs maintained and housed by BSB. The RMAP database is used to store data regarding residential soils and dust and lead abatement response actions. This information might include, but will not be limited to, the following:

- Homeowner requests for sampling.
- Access agreements.
- Soil and dust sampling results.
- Lead abatement results.
- Residential site (yard) conditions.
- Remediation completed (year completed, materials, quantities, etc.).
- Cover soil source and depth applied.
- Additional requests for reclamation.

[7] The RMAP database is under development at the time of this document preparation. This document will be revised and final components of the RMAP database will be included on completion.

9.0 REFERENCES

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FIGURES

Appendix A
Reclaimed Areas Maintenance and Monitoring Quality Assurance Project Plan

https://pioneertechnicalservices.sharepoint.com/:b:/s/submitted/Ebj_4MWC5ENErHdG89yMF6QBlvjK5T1dpsi483fuVSAQWg

Appendix B
Reclaimed Areas Maintenance and Monitoring Plan in Accordance with Butte Reclamation Evaluation System (BRES)

https://pioneertechnicalservices.sharepoint.com/:f:/s/submitted/EtIstRi99B9Kh94vArqyOQMBg6mJxJyHqJcKF-3znrb43g

Appendix C
Butte Reclamation Evaluation System Field Manual

https://pioneertechnicalservices.sharepoint.com/:f:/s/submitted/Ej9GlvLbgVZHqI7gpBxAbL0BO-416Sa70798RmH_rO7a-w

Appendix D
Unreclaimed Sites Quality Assurance Project Plan

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

Appendix E
Residential Metals Abatement Program Quality Assurance Project Plans

Appendix E.1
RMAP QAPP (Residential Parcels)

A link to the current RMAP QAPP (Residential Parcels) will be included upon Agency approval.

Appendix E.2
RMAP QAPP Plan (Non-Residential Parcels)

https://pioneertechnicalservices.sharepoint.com/:f:/s/submitted/EpJzQYNid1pDvVZX2Jzbnh4B4_2tBd1xR3o2ENTvqECZZg.

Appendix E.3
RMAP QAPP (Non-Residential Parcels-Indoor Dust)

A link to the current RMAP QAPP (Non-Residential Parcels – Indoor Dust) will be included upon Agency approval.

Appendix F
Multi-Pathway Residential Metals Abatement Program

https://pioneertechnicalservices.sharepoint.com/:b:/s/submitted/EfwAYMYX5rJMk0h-_8_12jIBYFivdw2ysvhWjryOfmjsBg.

Appendix G
BSB Snow Maintenance Plan

A link to the BSB Snow Maintenance Plan will be included on Agency approval.

Appendix H
RARUS Railway BPSOU Superfund Operations and Maintenance (O&M) Plan

https://pioneertechnicalservices.sharepoint.com/:b:/s/submitted/EcURBwLm3aBAjk6NNU-QiBkBO5WFUY0uq3tcAmrNK0Naxw.