

**SECOND FIVE-YEAR REVIEW REPORT FOR
RICHARDSON FLAT TAILINGS SUPERFUND SITE
SUMMIT COUNTY, UTAH**



Prepared by

**U.S. Environmental Protection Agency
Region 8
Denver, Colorado**

A handwritten signature in blue ink, reading "Betsy Smidinger", is written over a horizontal dashed line.

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8/10/18
Date

Table of Contents

LIST OF ABBREVIATIONS AND ACRONYMS	3
I. INTRODUCTION.....	4
Site Background.....	4
FIVE-YEAR REVIEW SUMMARY FORM	9
II. RESPONSE ACTION SUMMARY	9
Basis for Taking Action	9
Response Actions	10
Status of Implementation	11
Systems Operations/Operation and Maintenance (O&M)	14
III. PROGRESS SINCE THE PREVIOUS REVIEW.....	14
IV. FIVE-YEAR REVIEW PROCESS.....	14
Community Notification, Community Involvement and Site Interviews	14
Data Review.....	15
Site Inspection.....	15
V. TECHNICAL ASSESSMENT	16
QUESTION A: Is the remedy functioning as intended by the decision documents?	16
QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of the remedy selection still valid?.....	16
QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?.....	16
VI. ISSUES/RECOMMENDATIONS	17
OTHER FINDINGS.....	17
VII. PROTECTIVENESS STATEMENT.....	17
VIII. NEXT REVIEW	17
APPENDIX A – REFERENCE LIST	A-1
APPENDIX B – SITE CHRONOLOGY	B-1
APPENDIX C – SITE MAPS	C-1
APPENDIX D – PRESS NOTICE	D-1
APPENDIX E – INTERVIEW FORMS	E-1
APPENDIX F – SITE INSPECTION CHECKLIST	F-1
APPENDIX G – SITE INSPECTION PHOTOS	G-1

Tables

Table 1: Summary of Planned and/or Implemented Institutional Controls (ICs).....	12
Table 2: Protectiveness Determinations/Statements from the 2013 FYR	14
Table 3: Status of Recommendations from the 2013 FYR.....	14
Table B-1: Site Chronology.....	B-1
Table H-1: Surface Water Data	H-1

Figures

Figure 1: Site Operable Units	6
Figure 2: Site Location Map.....	7
Figure 3: Detailed Map of OU1.....	8
Figure 4: Institutional Control Map.....	13
Figure C-1: Remedial Design Task Areas.....	C-2
Figure C-2: 2008 Phase 2 Completion Map	C-3
Figure C-3: 2009 Phase 3 Completion Map	C-4
Figure C-4: 2010 Phase 4 Completion Map	C-5
Figure C-5: 2011 Phase 5 Completion Map	C-6

LIST OF ABBREVIATIONS AND ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CD	Consent Decree
CFR	Code of Federal Regulations
CIC	Community Involvement Coordinator
EPA	United States Environmental Protection Agency
FYR	Five-Year Review
IC	Institutional Control
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PCMC	Park City Municipal Corporation
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
UPCM	United Park City Mines
USFWS	United States Fish and Wildlife Service
UTDEQ	Utah Department of Environmental Quality
UU/UE	Unlimited Use and Unrestricted Exposure

I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP) (40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the second FYR for the Richardson Flat Tailings Site (the Site). The triggering action for this statutory review is the completion date of the previous FYR. The FYR has been prepared because hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site is located in and around Park City, within Summit County, Utah, in the Silver Creek watershed. Mining activities began in the upgradient mining district in the late 1860s. The Site, located in and around Silver Creek, downstream of the mining district, has been impacted by mining waste. The Site consists of four operable units (OUs) (Figure 1). This FYR addresses OU1, the Richardson Flat tailings impoundment (Figure 2). Remedial action has occurred at OU1, as discussed in Section II. Site characterization investigations are ongoing at the remaining OUs. OU2 encompasses approximately 1,216 acres along Lower Silver Creek north and east of Highway 40. OU3 encompasses approximately 856 acres located east of Park City in areas along Silver Creek. These two OUs are comprised of mine tailings that have come to be located in the Lower Silver Creek floodplain. Investigations are ongoing to determine the nature and extent of contamination within the flood plain and upland areas. OU4 is an ongoing discharge known as Prospector Drain. The drain was installed during the 1970s to lower the water table in order to develop Prospector Park and Prospector Square (a park and housing development) on tailings material. In 2008, Park City Municipal Corporation (PCMC) constructed a biocell to reduce the concentrations of cadmium and zinc in the water captured by the drain. Supplemental flow that is not processed through the biocell is bypassed to Silver Creek. Investigations are ongoing to determine the nature and extent of contamination at OU4.

EPA remedial project manager (RPM) Robert Parker led the FYR. Participants included Mo Slam from the Utah Department of Environmental Quality (UTDEQ), EPA community involvement coordinator (CIC) Katherine Jenkins, and Ryan Burdge and Treat Suomi of Skeo. The review began on 5/31/2017.

Site Background

OU1 consists of approximately 258 acres of land, including a tailings impoundment that covers approximately 160 acres of land. The impoundment was a mine tailings reservoir created prior to 1950. It is now the location of approximately 7 million tons of sand-sized carbonaceous particles and minerals containing zinc, silver, lead and other metals. Appendix A and B include a list of relevant site documents and site chronology.

According to the Remedial Investigation (RI) report, few details are known about the original embankment along the western area of OU1, but it is believed to have been constructed as part of the original tailings impoundment. In the 1970s, to accommodate additional tailings, an operator constructed a large earth embankment along the western edge of the impoundment, perimeter containment dikes along the southern and eastern borders of the impoundment and a diversion ditch system north of the impoundment and along the southern and eastern containment dikes. The impoundment was last used as a repository for new tailings in 1982. Currently, most of OU1 is a covered tailings impoundment bounded by containment dikes with the main embankment to the northwest (Figure 3). A parking area is located at the eastern end of OU1.

Silver Creek flows along the northwest border of the OU, separated from OU1 by a small stretch of wetlands and

riparian vegetation. Most of the land around OU1 is undeveloped open space, although there is development interest in the Silver Creek valley in the general area of OU1. OU1 lies within a 650 acre parcel owned by United Park City Mines (UPCM), a potentially responsible party (PRP). While no final decision has been made on future use at OU1, potential uses range from open space wildlife habitat to athletic fields. Currently, a recreation trail passes through the Site alongside Silver Creek.

Surface water features at OU1 include the south diversion ditch, the wetlands area below the embankment and a pond. All the surface water and shallow groundwater at OU1 eventually discharge to Silver Creek, which is classified by the State as a potential drinking water source, a recreational use feature, a cold-water fishery and a potential irrigation source.

A 12-square mile downgradient well inventory conducted during the RI determined that all wells are deeper than 150 feet and there are no known wells located within a half mile of OU1. The shallow groundwater at OU1 is generally associated with the alluvial system of Silver Creek. The Silver Creek alluvial aquifer is very high in total dissolved solids and is often contaminated due to water quality in Silver Creek and tailings that are present along the creek in many areas. The OU1 RI concluded that OU1 does not present a risk to the Silver Creek alluvial aquifer due to the relative contaminant concentrations between shallow groundwater present at OU1 and higher concentrations present in the alluvial groundwater. The potential for impacts to the Silver Creek alluvial aquifer by OU1 should be re-evaluated in future FYRs due to future OU 2 and 3 remediation efforts. There are no known current uses for the shallow aquifer.

Figure 1: Site Operable Units

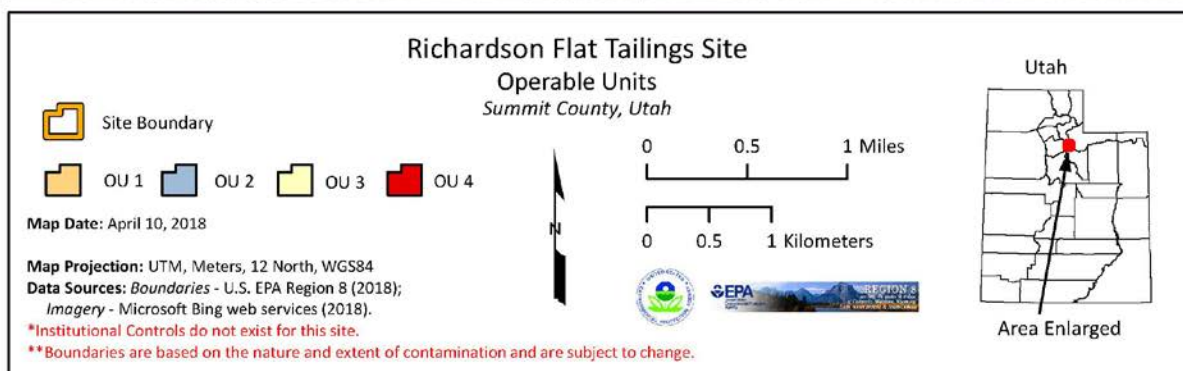
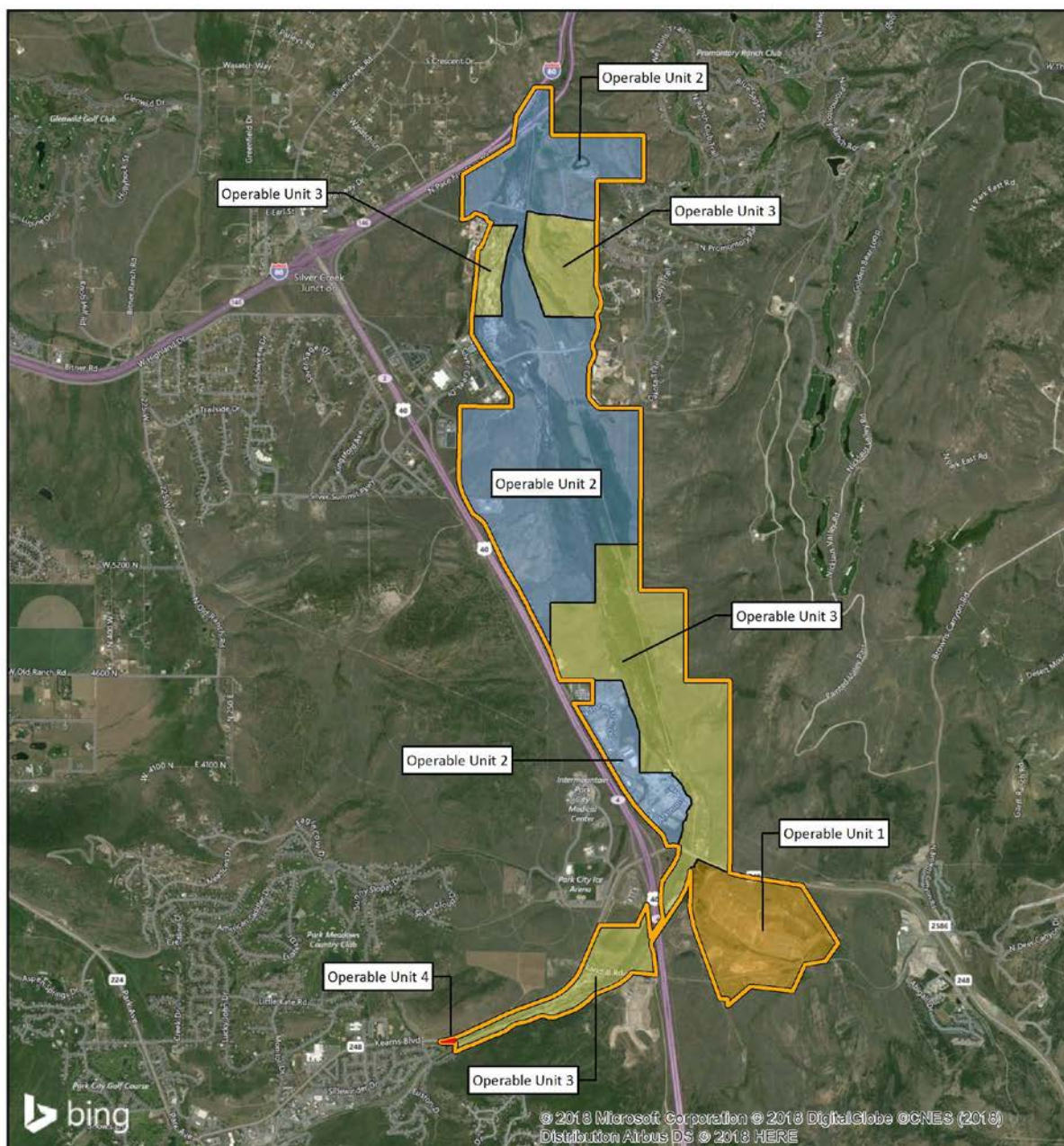
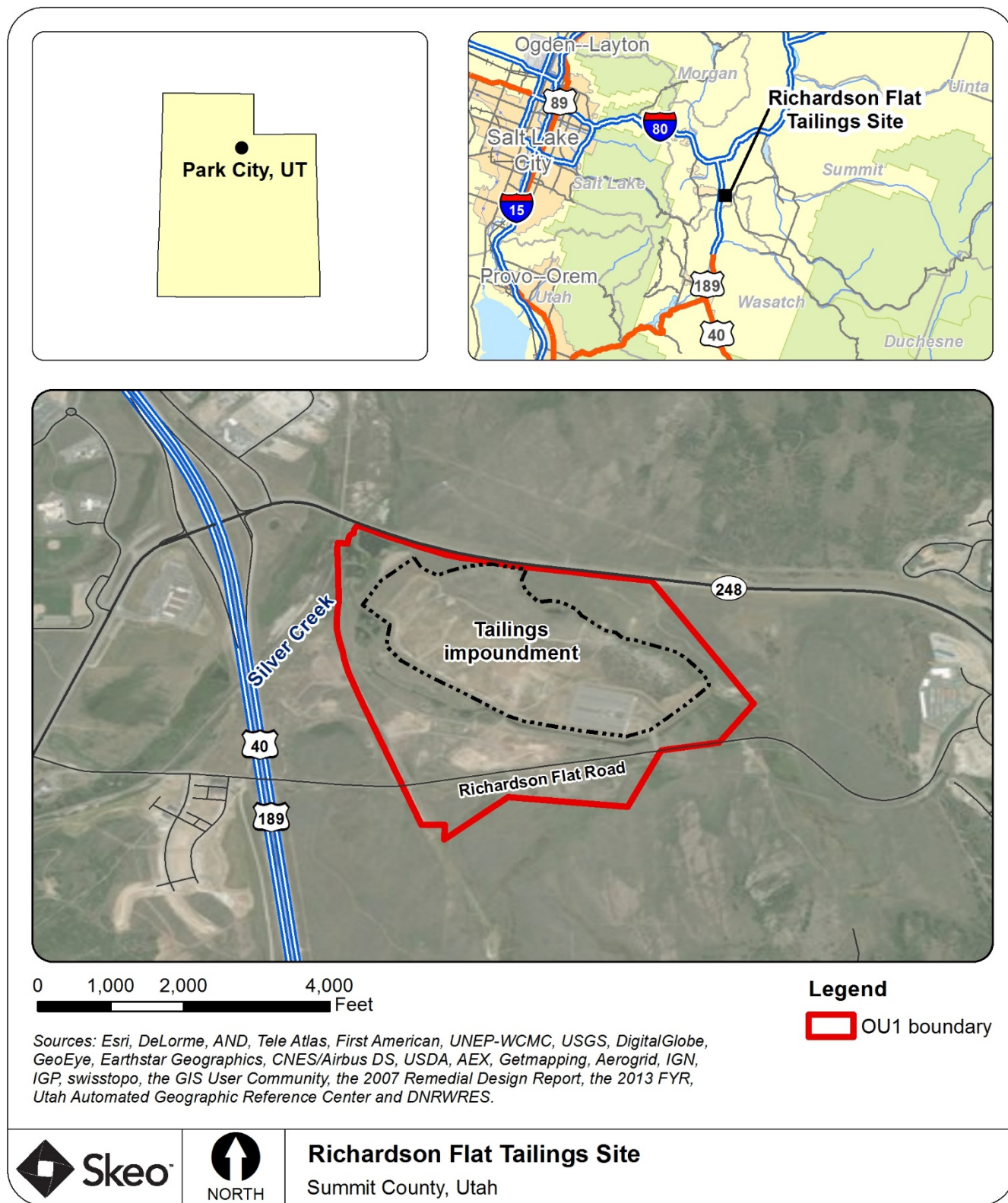
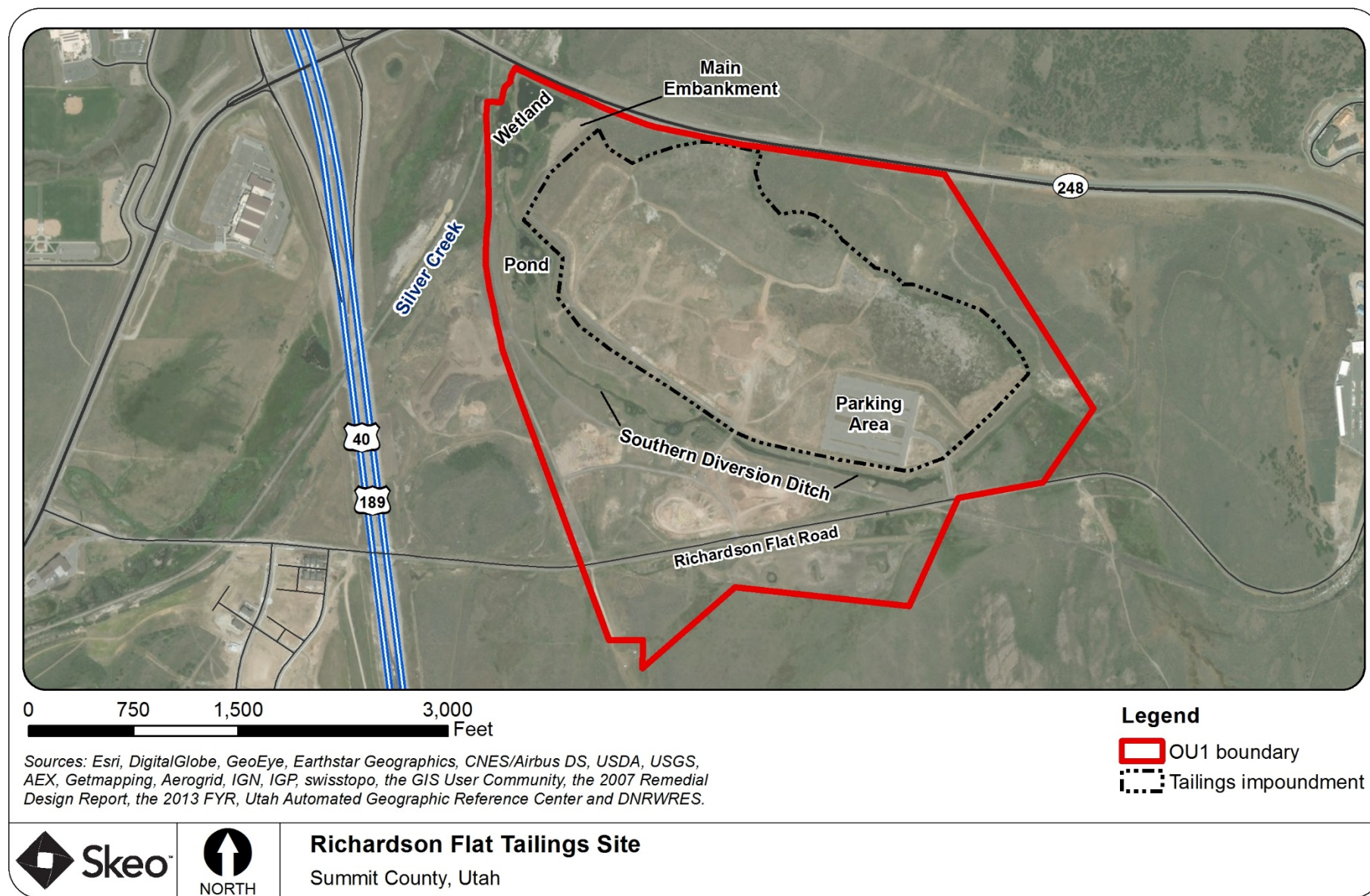


Figure 2: Site Location Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site

Figure 3: Detailed Map of OU1



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Richardson Flat Tailings		
EPA ID: UTD980952840		
Region: 8	State: Utah	City/County: Park City/Summit
SITE STATUS		
NPL Status: Proposed		
Multiple OUs? Yes	Has the Site achieved construction completion? No	
REVIEW STATUS		
Lead agency: EPA		
Author name: Rob Parker with contractor support provided by Skeo		
Author affiliation: EPA Region 8 and Skeo		
Review period: 5/31/2017 – 3/14/2018		
Date of site inspection: 9/21/2017		
Type of review: Statutory		
Review number: 2		
Triggering action date: 3/14/2013		
Due date (five years after triggering action date): 3/14/2018		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

EPA began initial site assessments in 1984. High-volume air sampling at OU1 in 1986 found that arsenic, cadmium, lead and zinc had been released to the air. EPA originally proposed the Site for listing on the National Priorities List (NPL) in 1988. After considering public comment, EPA removed the Site from NPL consideration in 1991. By 1992, the Hazard Ranking System (HRS) had been revised, and EPA again proposed the Site for listing on the NPL. Ultimately, EPA decided not to pursue final listing on the NPL, and the Site remains proposed for the NPL.

On September 28, 2000, EPA and UPCM signed an Administrative Order on Consent requiring UPCM to conduct a remedial investigation/focused feasibility study for OU1. Sampling confirmed contamination with heavy metals, primarily zinc, lead and arsenic, in the sediments and surface water of the south diversion ditch, the on-site wetland and Silver Creek. OU1's 2003 baseline human health risk assessment determined there were potential future risks from lead and arsenic to recreational users, the targeted use population. EPA deemed remedial action

was necessary to maintain and improve the soil cover placed on the tailings and to prevent disturbances to the soil cover that could allow for exposure to the underlying tailings.

The ecological risk assessment identified substantial risks to ecological receptors at OU1 from exposure to zinc, cadmium, lead and arsenic found in environmental media at the Site. Exposure pathways included direct contact with the sediments in the south diversion ditch and the wetlands area. These exposure areas also presented risks to ecological receptors through contact or ingestion of surface water and sediment porewater found at the Site.

Response Actions

During the 1990s, prior to the Record of Decision (ROD), UPCM completed voluntary work at OU1, including covering most of the tailings pile with clean, low-permeability soil and reseeded the Site. UPCM also improved the diversion ditch.

EPA selected the final OU1 remedy in the Site's 2005 ROD. To address existing and potential risks, as well as to accommodate the anticipated future recreational and ecological use of OU1, EPA developed nine remedial action objectives (RAOs):

- Reduce risks to wildlife receptors in the wetland area and south diversion ditch such that hazard indexes for lead are less than or equal to 1.
- Ensure that recreational users, including children, continue to have no more than a 5 percent chance of exceeding a blood lead level of 10 micrograms per deciliter from exposure to lead in soils.
- Ensure that recreational users, including children, continue to have no more than 1×10^{-4} chance of contracting cancer from exposure to arsenic in soils.
- Eliminate the risk of catastrophic failure of the tailings impoundment.
- Ensure that surface water discharged from the Site meets applicable Utah water quality standards.
- Eliminate the possibility of future groundwater use and withdrawal at the Site.
- Allow for a variety of future recreational uses.
- Allow for future disposal of mine tailings from the Park City area within the tailings impoundment until the remedy is complete.
- Minimize post-cleanup disturbance of tailings and contaminated soil. Provide controls that ensure any necessary disturbance at the Site follows prescribed methods.

The selected remedy addressed mine tailings located in several areas of OU1, including the main impoundment, a section south of the diversion ditch, and the wetlands below the embankment. Other media addressed through the selected remedy were sediments and surface water located within the OU1 boundary.

Major components of the remedy include:

- Excavate tailings in critical areas outside the impoundment and place tailings inside the impoundment.
- Augment the soil cover to achieve a depth of at least 18 inches of soil (containing less than 500 mg/kg lead) above tailings.
- Allow for placement of additional mine waste from the Silver Creek watershed within the impoundment which, upon completion, will require 18 inches of cover.
- Cover sediments in diversion ditch with clean fill.
- Excavate contaminated sediments and soils in the wetland below the embankment and place sediments inside the impoundment. A sediment remediation goal of 310 milligrams per kilogram (mg/kg) lead was established.
- Fortify the existing embankment to prevent catastrophic failure.
- Implement institutional controls (easements and land use restrictions) to protect soil cover and prevent groundwater use.

- Monitor surface water. Water quality samples were collected at the mouth of the diversion ditch quarterly for two years after construction was completed to ensure that discharges into Silver Creek met applicable water quality standards. (See Appendix H)

As discussed previously, the OU1 ROD contemplated the consolidation of mine wastes at OU1 from other cleanup locations in the Silver Creek watershed. Certain areas of OU1, including F-2 and F-3, have a temporary 6 inch soil cover to facilitate further consolidation while EPA continues OU2 and OU3 site characterization to determine if additional material will be brought to these areas prior to placing the full 18 inch cover material. Furthermore, the OU1 Consent Decree (CD) authorized, until EPA issues the Certificate of Completion, UPCM to accept mine waste, subject to EPA written approval. EPA last provided this approval in 2010. Appropriate cover material, as required by the ROD, will be placed prior to issuance of a Certificate of Completion. As part of a separate, EPA lead time critical removal action at a nearby school, additional off-site lead-contaminated materials were placed and covered in the impoundment in 2016. Additional soils that have been brought on-site to be used as future cover or fill material have been screened at 500 mg/kg lead, if originating from potentially contaminated areas, to ensure compliance with the ROD.

The OU1 RI concluded that OU1 does not present a risk to off-site groundwater due to a confining layer below contaminated groundwater that limits migration to deeper aquifers and the relative contaminant concentrations between shallow groundwater present at OU1 and higher concentrations present in the nearby Silver Creek alluvial groundwater. The potential for contaminant contribution from OU1 to Silver Creek alluvial groundwater should be re-evaluated in future FYRs due to ongoing remediation efforts within OU2 and OU3 at the Site. Regardless, on-site shallow groundwater contains metals at concentrations that exceed drinking water standards. Groundwater use at the Site will be restricted through institutional controls to ensure no unacceptable exposures.

Status of Implementation

UPCM initiated the OU1 remedial design on August 7, 2007, and completed it on October 7, 2007. Remedial action began on February 7, 2008. Remedy construction at OU1 was completed by UPCM, with EPA oversight, and included consolidating tailings material within the main impoundment, installing a wedge buttress to support the main embankment, and removing sediments in the wetland area. The remedial activities occurred in a phased approach, based on the tasks described in the remedial design (Figure C-1). In 2011, UPCM completed planned construction activities for OU1, except for the additional cover material in certain locations where only temporary cover currently exists. Additional cover material will be needed in these locations once it is determined consolidation of mine waste material is complete or no longer necessary.

The main embankment fortification consisted of constructing a wedge buttress in 2008, in accordance with a 2001 slope stability evaluation. From 2008-2011, all tailings in critical areas outside the impoundment were excavated and moved inside the impoundment (see Appendix C for maps of removal areas). Approximately 46,000 cubic yards of contaminated material were removed from the embankment wetland. Wetland restoration consisted of grading and revegetation with appropriate plant species. As required by the Remedial Design/Remedial Action Plan, confirmation sampling verified that soils remaining in each source removal area and soils placed as cover contain less than 500 mg/kg lead and 100 mg/kg arsenic. Lead concentrations for source removal in the embankment wetland were set at 500 mg/kg for soils and 310 mg/kg for sediments. Sediment sampling results from 23 source removal lead confirmation samples collected in the embankment wetland area averaged 43.1 mg/kg, ranging from 33 to 126 mg/kg. Post-construction measurements of the impoundment indicated that all areas measured contain at least 18 inches of clean fill material, with the exception of areas F-2 and F-3. Tailings excavated from the embankment area and additional regional sources were placed in impoundment areas F-2 and F-3 and covered with a temporary 6-inch soil cover while EPA continues OU2 and OU3 site characterization to determine if additional material will be brought to these areas prior to placing the full 18 inch cover material.

Surface water monitoring was performed to monitor migration of metals from the Site. The results of all samples were significantly below the TMDL limits for the Silver Creek Watershed. (See Appendix H)

Institutional Control (IC) Review

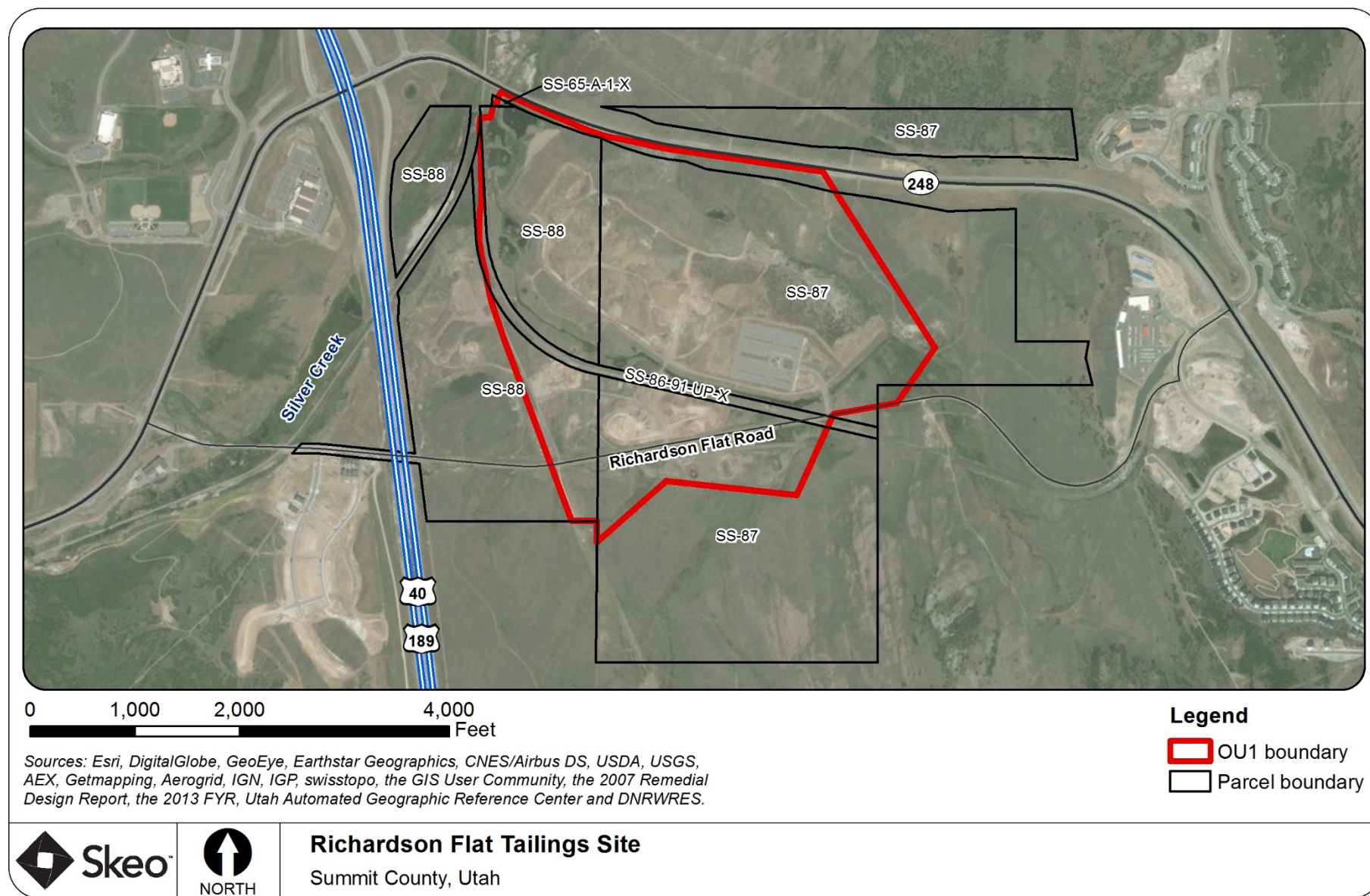
Institutional controls called for in the ROD are not yet in place (Table 1). The property is currently zoned as rural residential. The ROD states that two primary institutional controls will be implemented to mitigate potential risks and ensure the long-term protectiveness of the remedy:

- *Groundwater use restrictions within the site boundary:* the goal is to preclude any use of shallow groundwater, as well as eliminate any significant alteration of the existing hydrogeologic system, such as mixing of aquifers.
- *Land use restrictions within the site boundary:* the goal is to preclude non-recreational uses and to ensure that the soil cover, or similar protections, are maintained.

Table 1: Summary of Planned and/or Implemented Institutional Controls (ICs)

Media, Engineered Controls, and Areas That Do Not Support UU/UE Based on Current Conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater	Yes	Yes	Site area within Parcels SS-87 and SS-88	Permanently restrict new groundwater well installation and use of shallow groundwater within the impoundment area.	To be determined
Soils	Yes	Yes	Site area within Parcels SS-87 and SS-88	Permanently limit the land use to open space with wildlife habitat and non-motorized recreational use. Permanently preserve the low-permeability tailings cap and specify the ongoing erosion control and maintenance requirements. Permanently prohibit unauthorized excavation at the Site and of the cap material.	To be determined

Figure 4: Institutional Control Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

Systems Operations/Operation and Maintenance (O&M)

OU1 is still in remedial action pending additional cover material in areas where future consolidation may occur. Some O&M activities are underway, including monitoring of site conditions, erosion, vegetation condition, water runoff and invasive plant management, as needed. Long-term surface water monitoring is not required pursuant to the ROD.

III. PROGRESS SINCE THE PREVIOUS REVIEW

This section includes the protectiveness determinations and statements from the last FYR as well as the recommendations from the last FYR and the status of those recommendations.

Table 2: Protectiveness Determinations/Statements from the 2013 FYR

OU #	Protectiveness Determination	Protectiveness Statement
1	Short-term Protective	The remedy at OU1 currently protects human health and the environment because tailings and sediments have been excavated, tailings have been contained through capping with clean soil and surface waters exiting the Site meet existing water quality standards. However, in order for the remedy to be protective in the long term, the following action needs to be taken: implementation of institutional controls that include restrictions on future land and groundwater use.

Table 3: Status of Recommendations from the 2013 FYR

Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date
Institutional controls called for in the ROD are not yet in place.	Implement necessary institutional controls to ensure the soil cover is protected and the shallow groundwater is not used. EPA and the PRP will identify the appropriate control instrument and the PRP will be responsible for implementation.	Under Discussion	EPA is working with the PRP to develop an institutional control plan.	NA

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Community Involvement and Site Interviews

A public notice was published in the *Park Record* newspaper, on 10/25/2017 (Appendix D). It stated that the FYR was underway and invited the public to submit any comments to the EPA. The results of the review and the report will be made available at the Site's information repository, Park City Public Library, located at 255 Park Avenue, Park City, Utah 84060.

During the FYR process, interviews were conducted to document any perceived problems or successes with the remedy implemented to date. The interviews are summarized below and included in Appendix E.

Mo Slam, UDEQ: Mr. Slam is the project manager for UTDEQ. He believes the PRPs have done a good job with the remedy construction and maintenance to date. However, he noted the long-term use and maintenance of the Site need to be clarified.

Chris Cline, U.S. Fish and Wildlife Service (USFWS): Ms. Cline is responsible for the Natural Resource Damage Assessment and Restoration for the Silver Creek watershed. She indicated the Site looks good, notably the established native vegetation and erosion controls. However, she expressed concern that not all areas of the Site were adequately sampled during the remedial design and that the potential for ecological exposure remains on unexcavated areas of the Site.

Jim Blankenau, Park City: Mr. Blankenau is the Environmental Regulatory Program Manager for Park City. He is aware of the Site. He is not aware of any issues.

Kerry Gee, UPCM: Mr. Gee is the project manager for UPCM. He believes the remedy is performing as intended and that quality habitat is now established on-site. He reported no issues at the Site.

Jami Brackin, Summit County: Ms. Brackin is the Summit County Deputy Attorney. She has been aware of the Site since 2004 and is not aware of any issues. She noted that, in the absence of institutional controls, current zoning does not prevent development at the Site.

Data Review

Surface Water

UPCM collected surface water samples annually from 2008 to 2013 and again in 2015 as part of OU2 and OU3 investigations to determine the effects of remediation on surface water quality. Surface water samples were collected primarily from the main flow of the embankment wetland, as well as at various points of the southern diversion ditch. The results of all samples were consistently below the surface water standards for the Silver Creek watershed (Appendix H).

Review of Cover Material Sampling

During her interview regarding the Site, Ms. Cline expressed concern that not all areas of the Site were adequately sampled during the remedial design, specifically a seasonal wet area on the northern portion of the impoundment. Subsequent to the interview with Ms. Cline, EPA reviewed the Phase 2 Task Completion Report, which included an evaluation of cover material in the area referenced by Ms. Cline. As reported in the Phase 2 TCR, UPCM collected samples at 6, 12 and 18 inches from 20 locations within area F-8. All samples were analyzed with XRF and reported to be below 500 mg/kg lead.

Site Inspection

The Site inspection for OU1 took place on 9/21/2017. Participants included EPA RPM Robert Parker, EPA CIC Katherine Jenkins, Mo Slam, Doug Bacon and Dave Allison from UTDEQ, Chris Cline from the USFWS, Alan Jones from the Bureau of Land Management, Jim Blankenau from Park City, Kerry Gee from UPCM, and Ryan Burdge and Treat Suomi from EPA FYR contractor Skeo. The purpose of the inspection was to assess the protectiveness of the remedy. The Site inspection checklist and photographs are included in appendices F and G.

Site inspection participants drove and walked relevant portions of the OU, including the stormwater diversion features, capped areas, the tailings impoundment and buttress, the wetland area, and the parking area. All areas were in good condition. Vegetation in the cover areas and wetlands appeared to be well established. The PRP reported no issues related to erosion or trespassing, but noted that invasive plants are increasingly present and increasingly challenging to manage.

Following the Site inspection, Skeo staff visited the designated document repository at the Park City Public Library. Site documents were unavailable at the time, but will be provided following completion of this FYR.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Yes, the OU1 remedy is performing as intended. Tailings outside of the impoundment have been excavated and placed under clean fill in the impoundment and the main embankment has been stabilized. Revegetation growth on remediated areas has performed well and the constructed wetland areas support healthy vegetation. Flora and fauna have recovered to levels that indicate that some natural resource services have been restored to the Site. Sampling indicated surface water exiting the Site is below Silver Creek water quality parameters.

The OU1 RI concluded that OU1 does not present a risk to off-site groundwater due to a confining layer below contaminated groundwater to protect deeper aquifers and the relative contaminant concentrations between shallow groundwater present at OU1 and higher concentrations present in the nearby Silver Creek alluvial groundwater. The potential for contaminant contribution from OU1 to Silver Creek alluvial groundwater should be re-evaluated in future FYRs due to ongoing remediation efforts within OU2 and OU3 at the Site.

Institutional controls to protect the soil cover and restrict groundwater use have not yet been implemented. The property is currently zoned as rural residential, which limits but does not prohibit residential development. However, the Site is owned by the PRP and public access is restricted through fencing, signage and an on-site presence. Recorded and legally enforceable restrictions as called for in the ROD are necessary to ensure no potential exposures in the future.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of the remedy selection still valid?

Yes. The exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of the OU1 remedy selection are still valid. The surface water exiting OU1 has consistently been below the relevant Silver Creek water quality standards.

The cleanup goal for lead of 500 mg/kg is based on anticipated recreational use. The remedy anticipated a future recreational use of the Site and public access to the Site is currently restricted to the paved parking area.

The human health cleanup levels for the Site were based on EPA guidance which recommended 10 µg/dL as the blood lead level of concern. In December 2016, EPA issued a memorandum which recommended that EPA consider the current scientific literature that suggests adverse health effects may be associated with blood lead levels below µg/dL. EPA Region 8 will continue to use the current EPA policy, until the Agency finalizes and update its policy.”

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations				
OU(s) without Issues/Recommendations Identified in the FYR:				
None				
Issues and Recommendations Identified in the FYR:				
OU(s):	Issue Category: Institutional Controls			
	Issue: Institutional controls called for in the ROD are not yet in place.			
	Recommendation: Implement necessary institutional controls to ensure the soil cover is protected and the shallow groundwater is not used.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	PRP	EPA	5/31/2019

OTHER FINDINGS

An additional recommendation was identified during the FYR. This recommendation does not affect current and/or future protectiveness.

- Although some maintenance activities are performed, a final O&M plan has not been prepared for OU1.

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)		
<i>Operable Unit:</i> OU1	<i>Protectiveness Determination:</i> Short-term Protective	<i>Planned Addendum Completion Date:</i>
<i>Protectiveness Statement:</i> The remedy at OU1 currently protects human health and the environment because tailings and sediments have been excavated, tailings are contained through capping with clean soil and surface waters exiting the Site are below water quality standards. However, for the remedy to be protective in the long term, the following action needs to be taken: implement institutional controls that include restrictions on future land and groundwater use.		

VIII. NEXT REVIEW

The next FYR Report for the Richardson Flat Tailings Site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

2005. United States Environmental Protection Agency, Record of Decision, Richardson Flat Tailings, EPA ID UT980952840.

2007. Resource Management Consultants, Inc., Remedial Design/Remedial Action Plan (RD/RA), Richardson Flat, Site ID Number: UT980952840.

2007. Resource Management Consultants, Inc., Phase 1 Field Construction Plan for 2008 Construction Season, Richardson Flat, Site ID Number: UT980952840.

2007. Resource Management Consultants, Inc., Phase 1 Task Completion Report, Richardson Flat, Site ID Number: UT980952840.

2008. Resource Management Consultants, Inc., Phase 2 Task Completion Report for 2008 Construction Season, Richardson Flat, Site ID Number: UT980952840.

2009. Resource Management Consultants, Inc., Phase 3 Task Completion Report for 2009 Construction Season, Richardson Flat, Site ID Number: UT980952840.

2010. Resource Management Consultants, Inc., Phase 4 Task Completion Report for 2010 Construction Season, Richardson Flat, Site ID Number: UT980952840.

2011. Resource Management Consultants, Inc., Phase 5 Task Completion Report for 2011 Construction Season, Richardson Flat, Site ID Number: UT980952840.

2011. Resource Management Consultants, Inc., Task Area Map, Richardson Flat, Site ID Number: UT980952840.

2012-2017. United Park City Mines Quarterly Status Reports, Richardson Flat, Site ID Number: UT980952840

2013. United States Environmental Protection Agency, Five-Year Review, Richardson Flat Tailings, EPA ID UT980952840.

APPENDIX B – SITE CHRONOLOGY

Table B-1: Site Chronology

Event	Date
EPA discovered contamination	October 1, 1984
PRP UPCM initiated the Site's remedial investigation/feasibility study	September 29, 1989
EPA proposed the Site for listing on the NPL	February 7, 1992
PRP UPCM completed the Site's remedial investigation/feasibility study	July 1, 1992
The EPA signed the Site's ROD for OU1	July 6, 2005
PRP UPCM initiated the Site's remedial design for OU1	August 7, 2007
PRP UPCM completed the Site's remedial design for OU1	
PRP UPCM initiated the remedial action for OU1	February 7, 2008
PRP UPCM and the EPA signed an administrative settlement agreement and order on consent for a remedial investigation/focused feasibility study for OU2	September 29, 2009
EPA approved completion of construction activities outlined in the remedial design	November 2011
EPA signed the Site's first FYR Report	March 14, 2013

APPENDIX C – SITE MAPS

Figure C-1: Remedial Design Task Areas

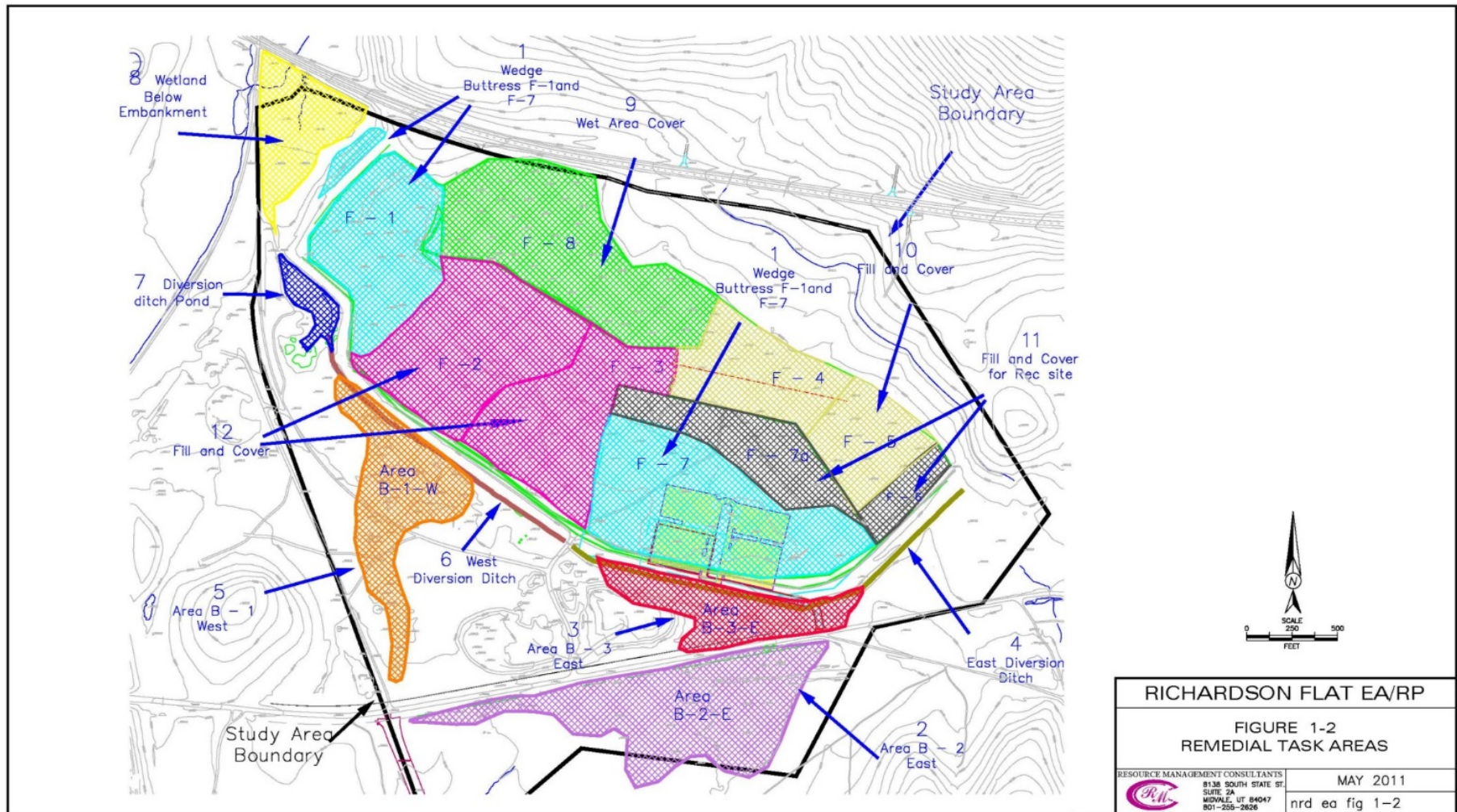


Figure C-2: 2008 Phase 2 Completion Map

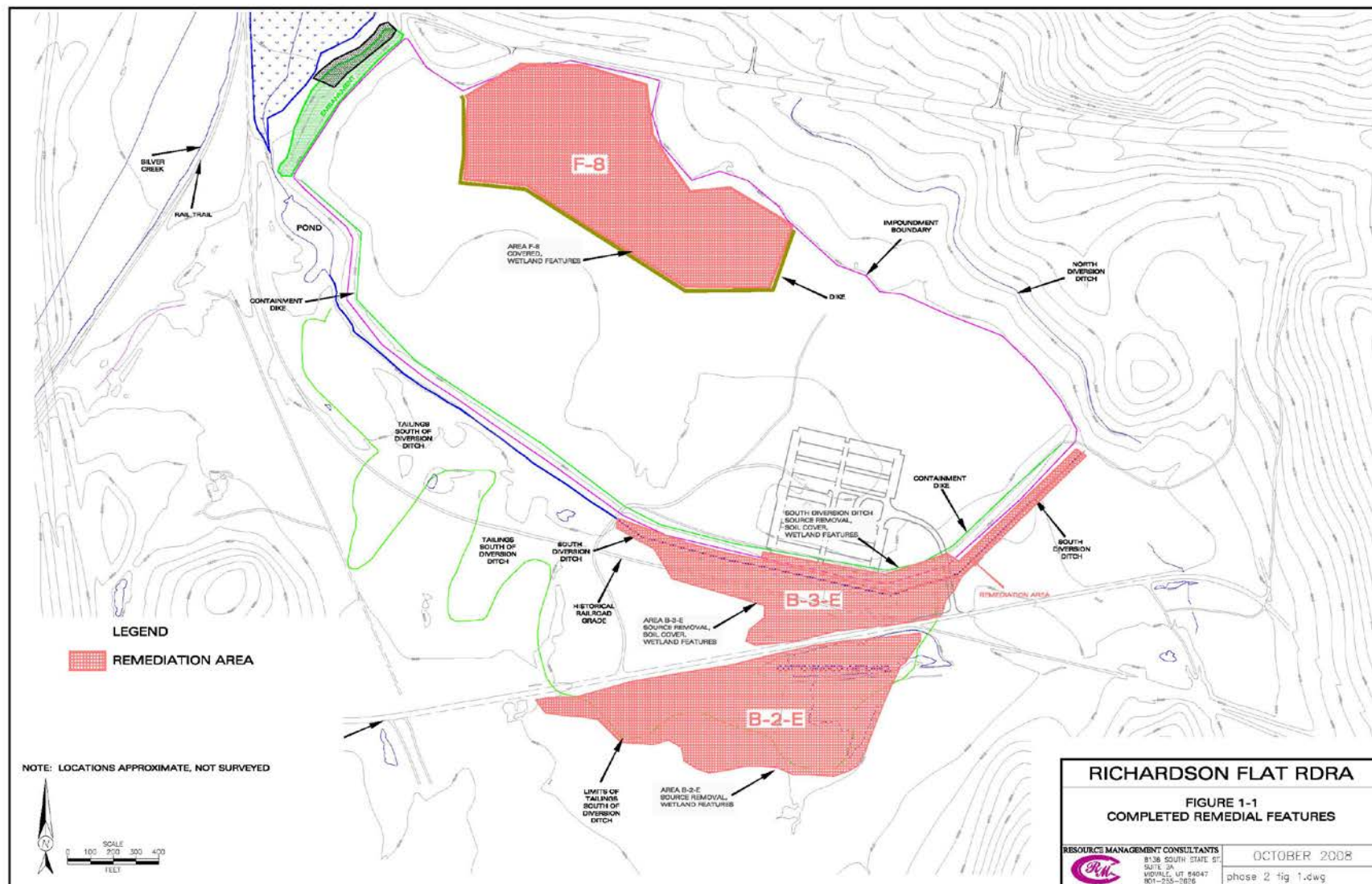


Figure C-3: 2009 Phase 3 Completion Map

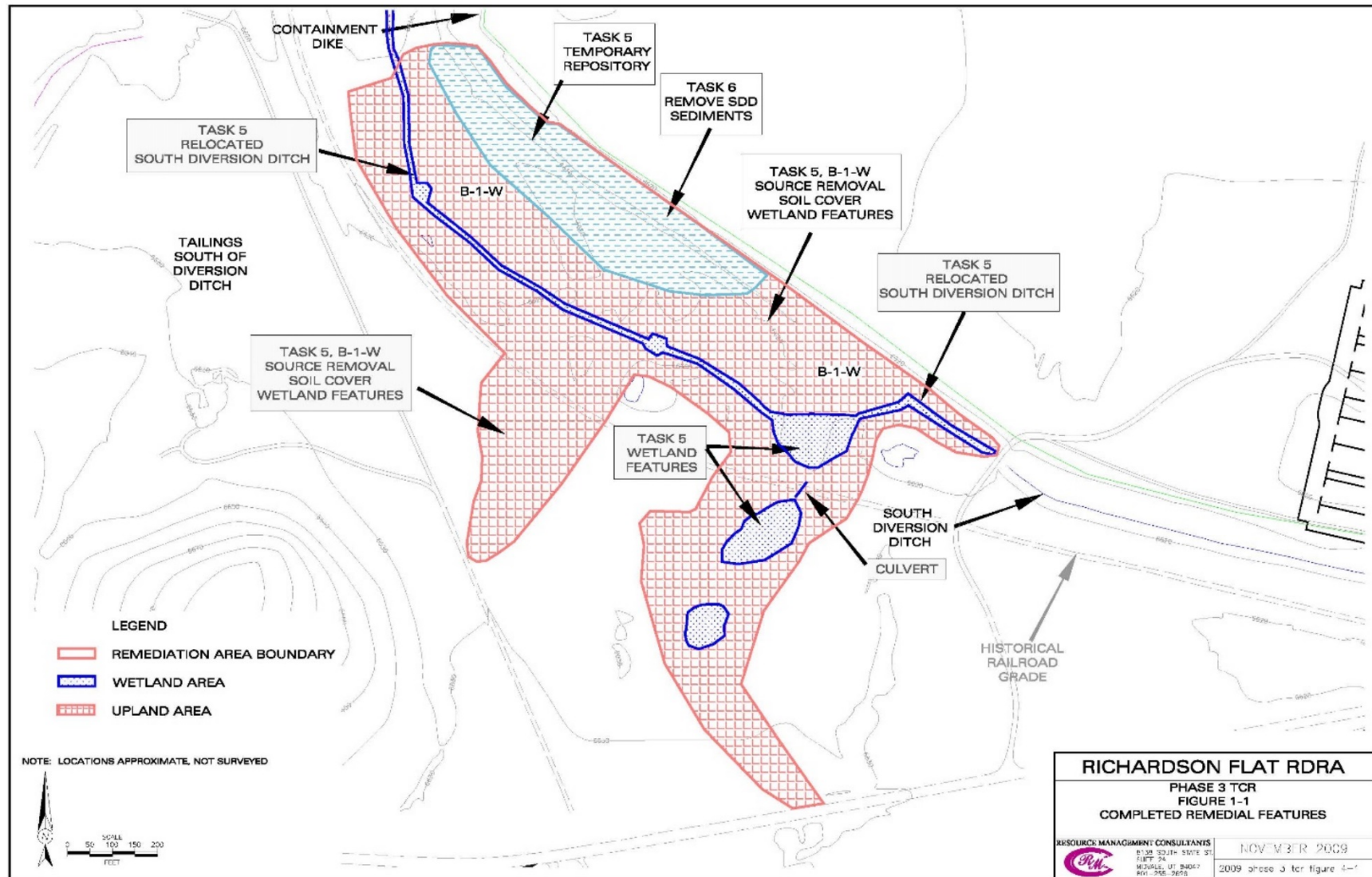


Figure C-4: 2010 Phase 4 Completion Map

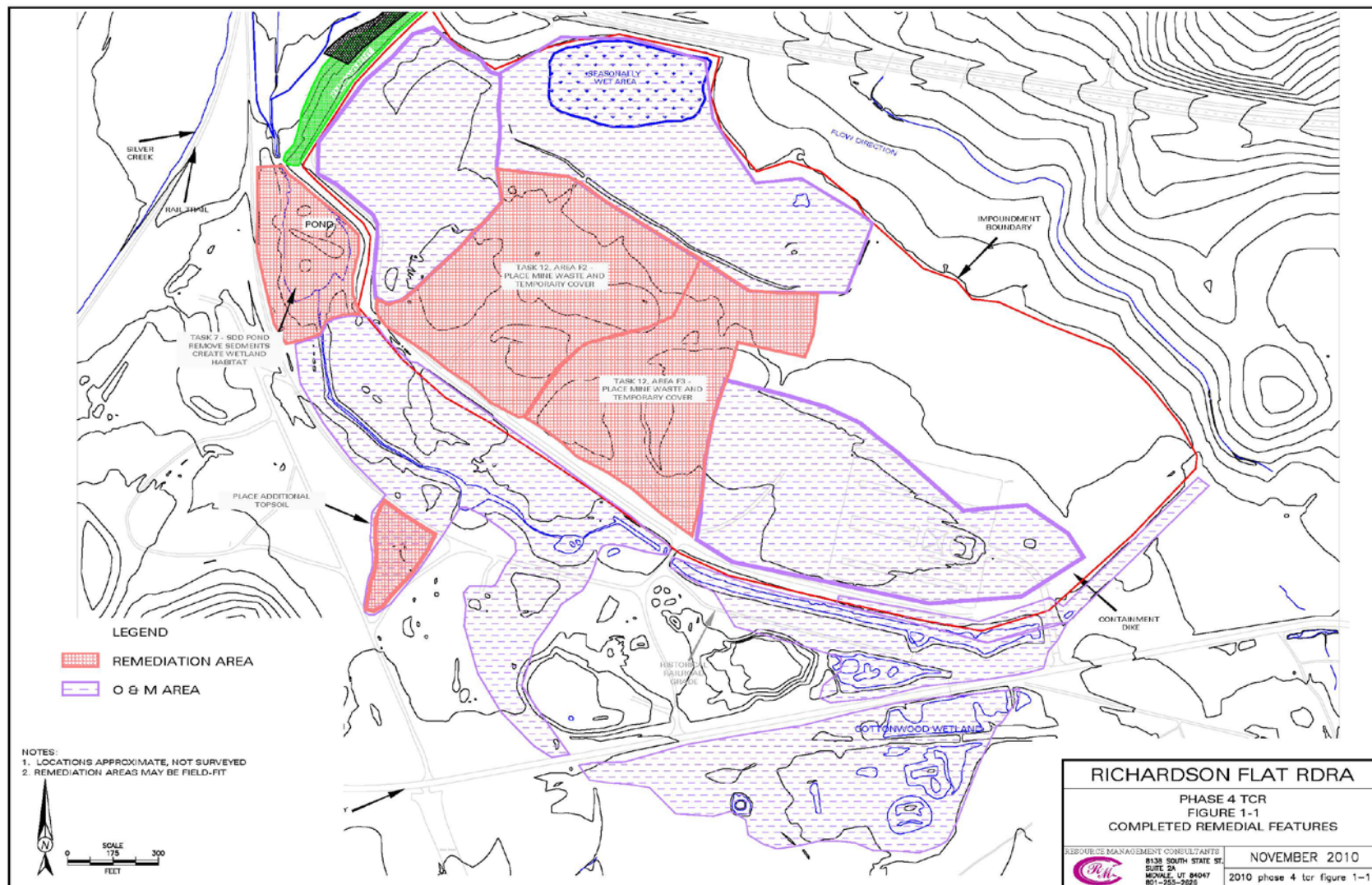
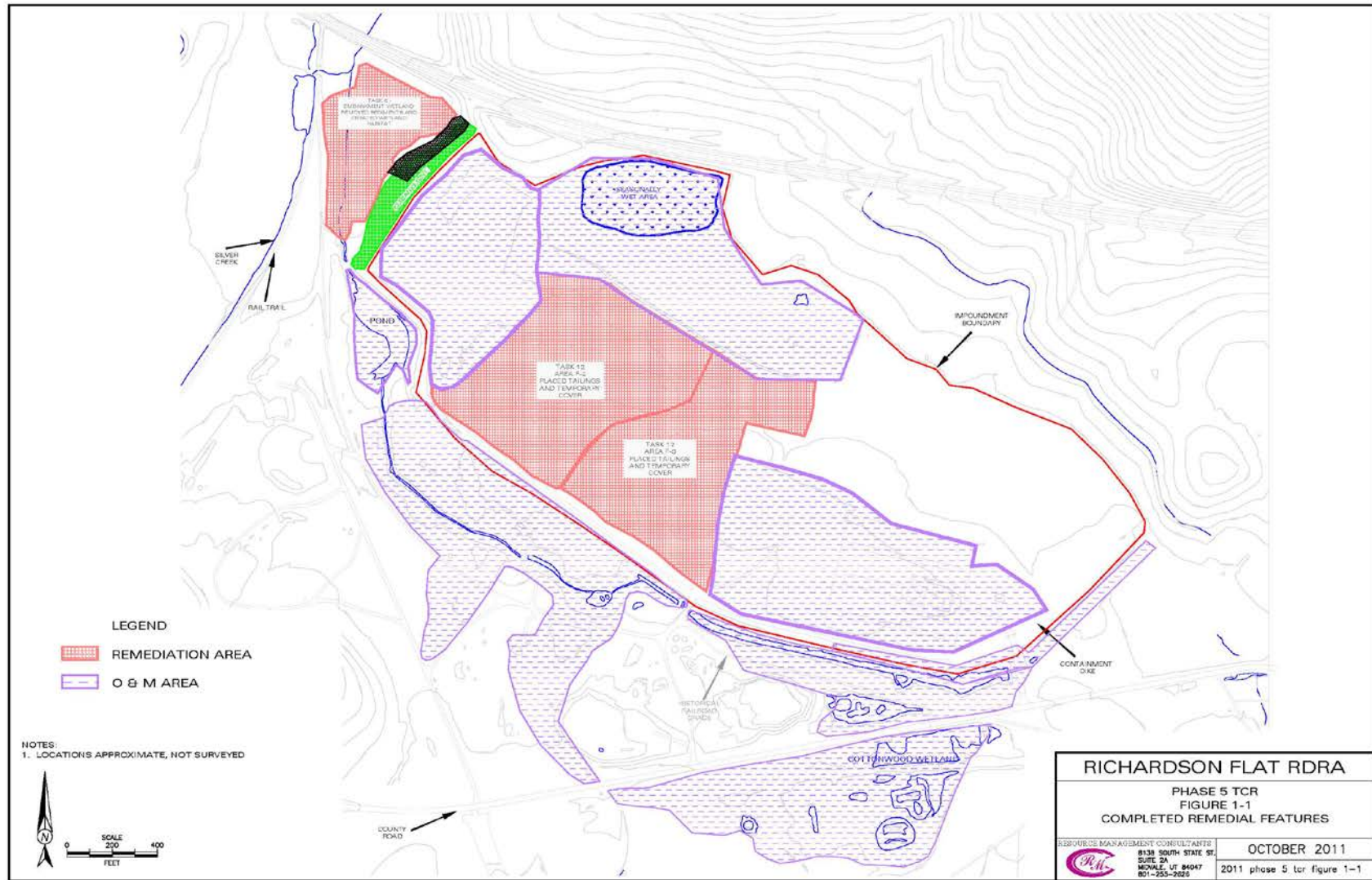


Figure C-5: 2011 Phase 5 Completion Map



APPENDIX D – PRESS NOTICE



The U.S. Environmental Protection Agency, Region 8 Announces the Second Five-Year Review for the Richardson Flat Tailings Superfund Site, Park City, Utah

The U.S. Environmental Protection Agency (EPA), in cooperation with the Utah Department of Environmental Quality (UTDEQ), is conducting the second five-year review for operable unit 1 (OU1) of the Richardson Flat Tailings Superfund site in Park City, Utah. The purpose of the five-year review is to make sure that the cleanup actions completed to date are adequately protecting human health and the environment. The five-year review for OU1 is scheduled to be completed by February 2018.

The 160-acre site is located southeast of the intersection of State Highway 248 and U.S. Highway 40 approximately 2 miles northeast of Park City, Utah. EPA proposed the Site for listing on the National Priorities List (NPL) in 1992. A tailings dam and impoundment on site were used to capture and hold mill tailings from 1953 until 1981, resulting in contamination of soil, groundwater, surface water and air.

EPA and UTDEQ selected a remedy in a 2005 Record of Decision (ROD). Cleanup activities at OU1 include excavation, containment, future disposal of mine tailings from the Park City area within the tailings impoundment, placement of restrictions on future land and groundwater use, and surface water monitoring.

We want to hear from you! Community members are always encouraged to share information that may help EPA and UTDEQ make determinations regarding the protectiveness and effectiveness of the remedies at the site. Please contact Katherine Jenkins if you would like to send your comments or be interviewed.

Share input with us by mail or email:

Katherine Jenkins, EPA Community Involvement Coordinator
Phone: 303-312-6351 • Email: jenkins.katherine@epa.gov
Mailing Address: U.S. EPA Region 8 (EPR-SR)
1595 Wynkoop Street, Denver, CO 80202-1129

Additional site information is available at:

EPA Superfund Records Center
1595 Wynkoop Street
Denver, CO 80202-1129
303-312-7273

Or online at: <https://www.epa.gov/superfund/richardson-flat>

2013 Five-Year Review:

<https://semspub.epa.gov/work/08/1260303.pdf>

2005 Record of Decision:

<https://semspub.epa.gov/work/08/2035008.pdf>

APPENDIX E – INTERVIEW FORMS

Richardson Flat Tailings Site

Five-Year Review Interview Form

Site Name: Richardson Flat Tailings

EPA ID No.: UTD980952840

Interviewer Name: Katherine Jenkins

Affiliation: EPA

Subject Name: Kerry Gee

Affiliation: UPCM

Subject Contact Information:

Time: 12:30 p.m.

Date: 09/21/2017

Interview Location: City Hall

Interview Format (circle one):

☒ In Person

☐ Phone

☐ Mail

☐ Other:

Interview Category: **Potentially Responsible Parties (PRPs), Property Owner**

1. What is your overall impression of EPA oversight on the remedial activities at the Richardson Flat tailings impoundment?
EPA oversight at OU1 is fine. There is not very much to reference as this is the current RPM's second trip to the Site. There is not much is going on, so the oversight is adequate.
2. What have been the effects of the Richardson Flat tailings impoundment on the surrounding community, if any?
For last five years, we have not brought out any waste except for EPA's waste from the middle school. That was an impact. At one point the community relied on Richardson Flat as a place to dump various soil wastes, but that stopped in 2010. I believe that ending was a major impact.
3. What is your assessment of the current performance of the remedy in place at the Richardson Flat tailings impoundment?
I think the remedy is fine. It is working and the Site provides good habitat. This was the first year that we had a significant winter precipitation and the on-site vegetation was hearty this spring. We observed a lot of waterfowl and birds this year. We continue to need to address beaver activity and invasive plants.
4. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup?
No.
5. What is the current land use and does it compare to the anticipated land use, specifically open space and recreational use, anticipated in the remedy decision?
Current land use is UPCM dealing with granular materials coming into the Site that are not contaminated. The RDRA has a closure plan, including financial assurance, about \$1 million to close it out as a repository.
6. Have there been any problems with unusual or unexpected activities at the Richardson Flat tailings impoundment, such as emergency response, vandalism or trespassing?
We always trespassing issues, mostly kids motorbiking south of the road when the water is low. In the past we have caught those people. A shepherd south of the road informs us about any trespassing issues.
7. Is there a continuous on-site O&M presence? If so, please describe staff responsibilities and activities. Alternatively, please describe staff responsibilities and the frequency of site inspections and activities if there is not a continuous on-site O&M presence.
No, we do not have a continuous O&M actions. We have a single O&M staff who is there once per week and sprays invasive plants when she can. If there were a program, we would have to hire people to do that. I am on-site one time per week. The soil loader is there pretty much every day.

8. Have there been any significant changes in site O&M requirements, maintenance schedules or sampling routines since start-up or in the last five years? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts.
We do not have anybody out there all the time. We have not sampled since 2015 for the OU2/3.
9. Do you feel well-informed regarding the Richardson Flat tailings impoundment activities and remedial progress? If not, how might EPA better convey site-related information in the future?
No. I would like to be informed when the RPM is going to be in town.
10. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?
We need more staff but are currently unable to hire right now.

Richardson Flat Tailings Site**Five-Year Review Interview Form**Site Name: Richardson Flat TailingsEPA ID No.: UTD980952840Interviewer Name: Katherine JenkinsAffiliation: EPASubject Name: Mo SlamAffiliation: UT DEQ

Subject Contact Information:

Time: 1:00 p.m.Date: 09/21/2017Interview Location: City Hall

Interview Format (circle one):

☒ In Person☐ Phone☐ Mail☐ Other:Interview Category: State Agency

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?
It is fairly good. So far they have done a good job. They have done the maintenance so far, but we do not yet know the reuse
2. What is your assessment of the current performance of the remedy in place at the Richardson Flat tailings impoundment?
It is currently protective of human health and the environment.
3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years?
No, none at all.
4. Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities.
The RPM and I have ongoing communications. The results are favorable.
5. Are you aware of any changes to state laws that might affect the protectiveness of the Richardson Flat tailings impoundment remedy?
There are no state changes.
6. Are you comfortable with the status of the institutional controls at the Richardson Flat tailings impoundment? If not, what are the associated outstanding issues?
UPCM is managing the Site property and controls well. There is a gate, fence, signs. No one is getting on site and being exposed.
7. Are you aware of any changes in projected land use(s) at the Site?
The plans are not concrete. The Site is a work in progress, so the reuse is not and cannot yet be known. It is all still ongoing.
8. Do you have any comments, suggestions or recommendations regarding the management or operation of the Richardson Flat tailings impoundment's remedy?
I have concerns about long-term O&M. UPCM has done good so far, but now they are having financial problems. Because of this, we do not know how they will manage long-term. Maintenance could be in limbo and it is not clear what will happen in the future.

Richardson Flat Tailings Site**Five-Year Review Interview Form**Site Name: Richardson Flat TailingsEPA ID No.: UTD980952840Interviewer Name: Katherine JenkinsAffiliation: EPASubject Name: Chris ClineAffiliation: USFWS

Subject Contact Information:

Time: 1:30 p.m.Date: 09/21/2017Interview Location: City Hall

Interview Format (circle one):

☒ In Person☐ Phone☐ Mail☐ Other:Interview Category: Government Agency

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

Overall impression is it is doing pretty well for limping along on three legs. Going out there today, we saw there is the revegetation and erosion controls part of the remedy, which overlaps with the restoration. I am impressed with the veg and overall lack of weeds. Good cover of native vegetation throughout. Seems like with the limited resources, from the NRD value standpoint, it looks pretty good. Site is starting to get thru first stage of succession, indicating the Site is stable enough. But I am concerned about the future.

I have been involved in NRDA with UPCM. OU1 outstanding issue: we were in negotiations for NRDA, but the PRP went ahead and did what they wanted to. They did good work and now want credit for it, said they went above and beyond requirement, so did a "desktop assessment" and made an economic model. Earned a credit, but they need to maintain and were supposed to develop a monitoring plan but did not. The model assumed perpetuity for restoration. USFWS needs something saying it is perpetuity, but UPCM wants to reserve right to develop. UPCM was supposed to get back with a map of what would not be developed. In theory, they have and want the credits, but FWS not willing to give it yet. In the future, it depends not only on UPCM, but also City and County. Who owns, who maintains, etc.

2. What is your assessment of the current performance of the remedy in place at the Richardson Flat tailings impoundment?

In the parts that are covered and vegetated, it looks pretty good. I am still concerned about area of possible future impoundment, fact it is little cover and a depression and seasonal wetland that was never sampled. The samplers did not want to get feet wet, so it was not sampled during the remedial investigation. That area is used by wildlife during spring when there is water, so there is a potential exposure. The idea seemed to be it was ok because it was to be filled and covered, but that has yet to happen. Silver Creek is pretty well segregated from the wetland, which is good. Visually looks good.

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years?

No, but I am not in that loop. In the past, kite-skiing. ATV use has been an issue in the past.

4. Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities.

I have no broad communication with community. I participated in some stakeholder meetings with the previous RPM and spoke about Richardson Flat as an example of restoration for OU2/3. Did some Rich Flat fact sheets that give history of site, cleanup process, restoration, etc. The community meeting was probably four years ago.

5. Are you aware of any changes to state laws that might affect the protectiveness of the Richardson Flat tailings impoundment remedy?

No. I would be a lot more concerned about local zoning requirements

6. Are you comfortable with the status of the institutional controls at the Richardson Flat tailings impoundment?
If not, what are the associated outstanding issues?
No. Long-term oversight and ownership/management. Security is a secondary concern. Also concerned lack of sufficient cap in some areas.
7. Are you aware of any changes in projected land use(s) at the Site?
I am aware there may be changes, but it is not clear where it is headed.
8. Do you have any comments, suggestions or recommendations regarding the management or operation of the Richardson Flat tailings impoundment's remedy?
Not really. The endpoints of the remedy, should continue. For site management, invasive species are starting to come in, but the PRP are financially limited. They may need to be handled differently.

Richardson Flat Tailings Site**Five-Year Review Interview Form**Site Name: Richardson Flat TailingsEPA ID No.: UTD980952840Interviewer Name: Katherine JenkinsAffiliation: EPASubject Name: Jami BrackinAffiliation: Summit County

Subject Contact Information:

Time: 2:30 p.m.Date: 09/21/2017Interview Location: Park City Library

Interview Format (circle one):

☒ In Person

Phone

Mail

Other:

Interview Category: Local Government

1. Are you aware of the former environmental issues at the Richardson Flat tailings impoundment (Site) and the cleanup activities that have taken place to date?
Yes. My role began 2004 with the assessment of Lower Silver Creek, and I became aware of the OU1. I became a go-to person for the county. We have monitored the cleanup, capacity, and restoration. As of 2010, we thought we knew the remaining capacity, EPA sent a letter in 2010 saying UPCM could take XX yards, but not more. The County is interested in expanding the overall acreage of UPCM property. We all want a way for Park City to not have to bring soils to Tooele. Summit County has capacity for OU2/3. As long as we all have capacity, then it is ok. All needs to be considered since they are related.
2. Do you feel well-informed regarding the Richardson Flat tailings impoundment activities and remedial progress? If not, how might EPA convey site-related information in the future?
EPA has been good about keeping us informed. I refer people to the EPA webpage. It is helpful. People can find info, the orders, sampling, etc.
3. Are you aware of the current land use of the Richardson Flat tailings impoundment? If so, what is the current land use and does it compare to the anticipated land use, specifically open space and recreational use, anticipated in the remedy decision.
Current zoning is 1 [residence] per 20 [acres]. So, it is developable, in theory. But, the current county general plan there is the potential for some multimodal development in the western corner [outside the repository] to transfer people out near that intersection. The total property is 640 acres for UPCM.
4. Are you aware of any changes in projected land use(s) at the Richardson Flat tailings impoundment?
There are a lot of ideas. Map in the general plan that shows the Site.
5. Have there been any problems with unusual or unexpected activities at the Richardson Flat tailings impoundment, such as emergency response, vandalism or trespassing?
No, actually OU1 has not had issues. No complaints for that property.
6. Are you aware of any changes to state laws or local regulations that might affect the protectiveness of the Richardson Flat tailings impoundment remedy?
Not that I'm aware.
7. Has EPA kept involved parties and surrounding neighbors informed of activities at the Richardson Flat tailings impoundment? How can EPA best provide site-related information in the future?
For the activities on site, info is so. For county, I just ask UPCM. It would be great if the webpage had all the info
8. Do you have any comments, suggestions or recommendations regarding the project?
No.

Richardson Flat Tailings Site**Five-Year Review Interview Form**Site Name: Richardson Flat TailingsEPA ID No.: UTD980952840Interviewer Name: Katherine JenkinsAffiliation: EPASubject Name: Jim BlankenauAffiliation: Park City

Subject Contact Information:

Time: 2:00 p.m.Date: 09/21/2017Interview Location: City Hall

Interview Format (circle one):

☒ In Person

Phone

Mail

Other:

Interview Category: Local Government

1. Are you aware of the former environmental issues at the Richardson Flat tailings impoundment (Site) and the cleanup activities that have taken place to date?
Yes.
2. Do you feel well-informed regarding the Richardson Flat tailings impoundment activities and remedial progress? If not, how might EPA convey site-related information in the future?
I feel much more informed more recently, especially since recent site visits. The website has been updated, which is helpful for me. The OSC website is nice, because it has the documents. I do point people to the website, especially the OSC site. If someone is doing a Phase 1 assessment and Richardson Flat comes up, it helps them to close out the environmental condition.
3. Are you aware of the current land use of the Richardson Flat tailings impoundment? If so, what is the current land use and does it compare to the anticipated land use, specifically open space and recreational use, anticipated in the remedy decision.
Yes, I am aware of the current land use and the City knows about chance of expansion. I am aware of the parking facility.
4. Are you aware of any changes in projected land use(s) at the Richardson Flat tailings impoundment?
Not aware of any specific land use changes. County may have more information.
5. Have there been any problems with unusual or unexpected activities at the Richardson Flat tailings impoundment, such as emergency response, vandalism or trespassing?
Not that I am aware of. We did have to move our telemetry system from the parking area and had to add a repeater due to the taller mounds of staged dirt.
6. Are you aware of any changes to state laws or local regulations that might affect the protectiveness of the Richardson Flat tailings impoundment remedy?
No, I am not aware of any.
7. Has EPA kept involved parties and surrounding neighbors informed of activities at the Richardson Flat tailings impoundment? How can EPA best provide site-related information in the future?
The website is good. Continued active communication. City owns property in OU2/3, which is different. We do get a lot of questions about the dirt piles, including "why can't I take my dirt there." City council would love short videos, and the City could maybe promote it.
8. Do you have any comments, suggestions or recommendations regarding the project?
No.

APPENDIX F – SITE INSPECTION CHECKLIST

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST			
I. SITE INFORMATION			
Site Name: Richardson Flat Tailings		Date of Inspection: 09/21/2017	
Location and Region: Park City, Utah, EPA Region 8		EPA ID: UTD980952840	
Agency, Office or Company Leading the Five-Year Review: EPA Region 8		Weather/Temperature: 40 degrees, sunny	
Remedy Includes: (Check all that apply) ☒ Landfill cover/containment ☐ Access controls ☒ Institutional controls ☐ Groundwater pump and treatment ☐ Surface water collection and treatment ☐ Other: _____ ☐ Monitored natural attenuation ☐ Groundwater containment ☐ Vertical barrier walls			
Attachments: ☒ Inspection team roster attached ☐ Site map attached			
II. INTERVIEWS (check all that apply)			
1. O&M Site Manager <u>Kerry Gee</u> Name Title Date Interviewed ☐ at site ☒ at office ☐ by phone Phone: _____ Problems, suggestions ☐ Report attached: _____			
2. O&M Staff Name Title Date Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____ Problems/suggestions ☐ Report attached: _____			
3. Local Regulatory Authorities and Response Agencies (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply. Agency <u>UTDEQ</u> Contact <u>Mo Slam</u> Name <u>Project Manager</u> Date Phone No. Title Problems/suggestions ☐ Report attached: _____ Agency <u>USFWS</u> Contact <u>Chris Cline</u> Name Title Date Phone No. Problems/suggestions ☐ Report attached: _____ Agency <u>Park City</u> Contact <u>Jim Blankeneau</u> Name <u>Environmental Regulatory Program Manager</u> Date Phone No. Title Problems/suggestions ☐ Report attached: _____ Agency <u>Summit County</u> Contact <u>Jamie Brackin</u> Name <u>Deputy</u> Date Phone No.			

Name _____ Problems/suggestions ☐ Report attached: _____ Agency _____ Contact _____ Name _____ Title _____ Date _____ Phone No. _____ Problems/suggestions ☐ Report attached: _____	Attorney Title	Date	Phone No.
4. Other Interviews (optional) ☐ Report attached: _____			
III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)			
1. O&M Documents ☐ O&M manual ☒ As-built drawings ☒ Maintenance logs ☐ Readily available ☐ Readily available ☒ Readily available ☐ Up to date ☒ Up to date ☒ Up to date ☐ N/A ☐ N/A ☐ N/A Remarks: _____			
2. Site-Specific Health and Safety Plan ☒ Readily available ☐ Contingency plan/emergency response plan ☐ Readily available ☐ Readily available ☐ Up to date ☐ Up to date ☐ N/A ☐ N/A Remarks: _____			
3. O&M and OSHA Training Records ☐ Readily available ☐ Readily available ☐ Up to date ☐ Up to date ☒ N/A ☒ N/A Remarks: _____			
4. Permits and Service Agreements ☐ Air discharge permit ☐ Effluent discharge ☐ Waste disposal, POTW ☐ Other permits: _____ ☐ Readily available ☐ Readily available ☐ Readily available ☐ Readily available ☐ Up to date ☐ Up to date ☐ Up to date ☐ Up to date ☒ N/A ☒ N/A ☒ N/A ☒ N/A Remarks: _____			
5. Gas Generation Records ☐ Readily available ☐ Readily available ☐ Up to date ☐ Up to date ☒ N/A ☒ N/A Remarks: _____			
6. Settlement Monument Records ☐ Readily available ☐ Readily available ☐ Up to date ☐ Up to date ☒ N/A ☒ N/A Remarks: _____			
7. Groundwater Monitoring Records ☐ Readily available ☐ Readily available ☐ Up to date ☐ Up to date ☒ N/A ☒ N/A Remarks: _____			
8. Leachate Extraction Records ☐ Readily available ☐ Readily available ☐ Up to date ☐ Up to date ☒ N/A ☒ N/A Remarks: _____			
9. Discharge Compliance Records ☐ Air ☐ Water (effluent) ☐ Readily available ☐ Readily available ☐ Up to date ☐ Up to date ☒ N/A ☒ N/A Remarks: _____			

10.	Daily Access/Security Logs	☐ Readily available	☐ Up to date	☒ N/A																				
Remarks: _____																								
IV. O&M COSTS																								
1.	O&M Organization ☐ State in-house ☒ PRP in-house ☐ Federal facility in-house ☐ _____ ☐ Contractor for state ☐ Contractor for PRP ☐ Contractor for Federal facility																							
2.	O&M Cost Records ☐ Readily available ☐ Funding mechanism/agreement in place Original O&M cost estimate: _____ ☐ Up to date ☒ Unavailable ☐ Breakdown attached Total annual cost by year for review period if available <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">From: _____ Date</td> <td style="width: 25%;">To: _____ Date</td> <td style="width: 25%;">_____ Total cost</td> <td style="width: 25%; text-align: right;">☐ Breakdown attached</td> </tr> <tr> <td>From: _____ Date</td> <td>To: _____ Date</td> <td>_____ Total cost</td> <td style="text-align: right;">☐ Breakdown attached</td> </tr> <tr> <td>From: _____ Date</td> <td>To: _____ Date</td> <td>_____ Total cost</td> <td style="text-align: right;">☐ Breakdown attached</td> </tr> <tr> <td>From: _____ Date</td> <td>To: _____ Date</td> <td>_____ Total cost</td> <td style="text-align: right;">☐ Breakdown attached</td> </tr> <tr> <td>From: _____ Date</td> <td>To: _____ Date</td> <td>_____ Total cost</td> <td style="text-align: right;">☐ Breakdown attached</td> </tr> </table>				From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached	From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached	From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached	From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached	From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
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From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached																					
3.	Unanticipated or Unusually High O&M Costs during Review Period Describe costs and reasons: _____																							
V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A																								
A. Fencing																								
1.	Fencing Damaged ☒ Location shown on site map ☒ Gates secured ☐ N/A Remarks: _____																							
B. Other Access Restrictions																								
1.	Signs and Other Security Measures ☐ Location shown on site map ☐ N/A Remarks: <u>"No trespassing" signs are posted.</u>																							
C. Institutional Controls (ICs)																								

1.	Implementation and Enforcement Site conditions imply ICs not properly implemented Site conditions imply ICs not being fully enforced Type of monitoring (e.g., self-reporting, drive by): _____ Frequency: _____ Responsible party/agency: _____ Contact _____ Name Title Date Phone no. Reporting is up to date Reports are verified by the lead agency Specific requirements in deed or decision documents have been met Violations have been reported Other problems or suggestions: ☐ Report attached	☐ Yes ☒ No ☐ N/A ☐ Yes ☒ No ☐ N/A ☐ Yes ☒ No ☐ N/A ☐ Yes ☒ No ☐ N/A ☐ Yes ☐ No ☒ N/A ☐ Yes ☐ No ☒ N/A
2.	Adequacy ☐ ICs are adequate ☒ ICs are inadequate ☒ N/A Remarks: <u>Current access restrictions prevent unacceptable exposures. Long-term land use and groundwater restrictions are called for in the ROD. However, they are not yet implemented.</u>	
D. General		
1.	Vandalism/Trespassing ☐ Location shown on site map ☒ No vandalism evident Remarks: _____	
2.	Land Use Changes On Site ☒ N/A Remarks: _____	
3.	Land Use Changes Off Site ☒ N/A Remarks: _____	
VI. GENERAL SITE CONDITIONS		
A. Roads ☒ Applicable ☐ N/A		
1.	Roads Damaged ☐ Location shown on site map ☐ Roads adequate ☐ N/A Remarks: _____	
B. Other Site Conditions		
Remarks: <u>Native vegetation is well established.</u>		
VII. LANDFILL COVERS ☒ Applicable ☐ N/A		
A. Landfill Surface		
1.	Settlement (low spots) ☐ Location shown on site map ☒ Settlement not evident Arial extent: _____ Depth: _____ Remarks: _____	
2.	Cracks ☐ Location shown on site map ☒ Cracking not evident Lengths: _____ Widths: _____ Depths: _____	

Remarks: _____			
3.	Erosion Aerial extent: _____ Remarks: _____	☐ Location shown on site map	☒ Erosion not evident Depth: _____
4.	Holes Aerial extent: _____ Remarks: _____	☐ Location shown on site map	☒ Holes not evident Depth: _____
5.	Vegetative Cover ☐ No signs of stress Remarks: _____	☒ Grass ☐ Trees/shrubs (indicate size and locations on a diagram)	☒ Cover properly established
6.	Alternative Cover (e.g., armored rock, concrete) Remarks: _____	☒ N/A	
7.	Bulges Aerial extent: _____ Remarks: _____	☐ Location shown on site map	☒ Bulges not evident Height: _____
8.	Wet Areas/Water Damage ☐ Wet areas ☐ Ponding ☐ Seeps ☐ Soft subgrade Remarks: _____	☒ Wet areas/water damage not evident ☐ Location shown on site map ☐ Location shown on site map ☐ Location shown on site map ☐ Location shown on site map	Aerial extent: _____ Aerial extent: _____ Aerial extent: _____ Aerial extent: _____
9.	Slope Instability ☒ No evidence of slope instability Aerial extent: _____ Remarks: _____	☐ Slides	☐ Location shown on site map
B. Benches ☐ Applicable ☒ N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1.	Flows Bypass Bench Remarks: _____	☐ Location shown on site map	☐ N/A or okay
2.	Bench Breached Remarks: _____	☐ Location shown on site map	☐ N/A or okay
3.	Bench Overtopped Remarks: _____	☐ Location shown on site map	☐ N/A or okay
C. Letdown Channels ☐ Applicable ☒ N/A (Channel lined with erosion control mats, riprap, grout bags or gabions that descend down the steep side			

slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1.	Settlement (Low spots)	☐ Location shown on site map	☐ No evidence of settlement
	Arial extent: _____		Depth: _____
	Remarks: _____		
2.	Material Degradation	☐ Location shown on site map	☐ No evidence of degradation
	Material type: _____		Arial extent: _____
	Remarks: _____		
3.	Erosion	☐ Location shown on site map	☐ No evidence of erosion
	Arial extent: _____		Depth: _____
	Remarks: _____		
4.	Undercutting	☐ Location shown on site map	☐ No evidence of undercutting
	Arial extent: _____		Depth: _____
	Remarks: _____		
5.	Obstructions	Type: _____	☐ No obstructions
	☐ Location shown on site map	Arial extent: _____	
	Size: _____		
	Remarks: _____		
6.	Excessive Vegetative Growth	Type: _____	
	☐ No evidence of excessive growth		
	☐ Vegetation in channels does not obstruct flow		
	☐ Location shown on site map	Arial extent: _____	
	Remarks: _____		
D. Cover Penetrations ☐ Applicable ☒ N/A			
1.	Gas Vents	☐ Active	☐ Passive
	☐ Properly secured/locked	☐ Functioning	☐ Routinely sampled
	☐ Evidence of leakage at penetration	☐ Needs maintenance	☐ Good condition
			☐ N/A
	Remarks: _____		
2.	Gas Monitoring Probes	☐ Properly secured/locked	☐ Functioning
	☐ Evidence of leakage at penetration	☐ Routinely sampled	☐ Good condition
		☐ Needs maintenance	☐ N/A
	Remarks: _____		
3.	Monitoring Wells (within surface area of landfill)		
	☐ Properly secured/locked	☐ Functioning	☐ Routinely sampled
	☐ Evidence of leakage at penetration	☐ Needs maintenance	☐ Good condition
			☐ N/A
	Remarks: _____		
4.	Extraction Wells Leachate		

	☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A Remarks: _____
5.	Settlement Monuments ☐ Located ☐ Routinely surveyed ☐ N/A Remarks: _____
E. Gas Collection and Treatment ☐ Applicable ☒ N/A	
1.	Gas Treatment Facilities ☐ Flaring ☐ Thermal destruction ☐ Collection for reuse ☐ Good condition ☐ Needs maintenance Remarks: _____
2.	Gas Collection Wells, Manifolds and Piping ☐ Good condition ☐ Needs maintenance Remarks: _____
3.	Gas Monitoring Facilities (e.g., gas monitoring of adjacent homes or buildings) ☐ Good condition ☐ Needs maintenance ☐ N/A Remarks: _____
F. Cover Drainage Layer ☐ Applicable ☒ N/A	
1.	Outlet Pipes Inspected ☐ Functioning ☐ N/A Remarks: _____
2.	Outlet Rock Inspected ☐ Functioning ☐ N/A Remarks: _____
G. Detention/Sedimentation Ponds ☐ Applicable ☒ N/A	
1.	Siltation Area extent: _____ Depth: _____ ☐ N/A ☐ Siltation not evident Remarks: _____
2.	Erosion Area extent: _____ Depth: _____ ☐ Erosion not evident Remarks: _____
3.	Outlet Works ☐ Functioning ☐ N/A Remarks: _____
4.	Dam ☐ Functioning ☐ N/A Remarks: _____
H. Retaining Walls ☐ Applicable ☒ N/A	
1.	Deformations ☐ Location shown on site map ☐ Deformation not evident Horizontal displacement: _____ Vertical displacement: _____ Rotational displacement: _____

Remarks: _____			
2.	Degradation	☐ Location shown on site map	☐ Degradation not evident
Remarks: _____			
I. Perimeter Ditches/Off-Site Discharge		☐ Applicable	☒ N/A
1.	Siltation	☐ Location shown on site map	☐ Siltation not evident
Area extent: _____		Depth: _____	
Remarks: _____			
2.	Vegetative Growth	☐ Location shown on site map	☐ N/A
☐ Vegetation does not impede flow			
Area extent: _____		Type: _____	
Remarks: _____			
3.	Erosion	☐ Location shown on site map	☐ Erosion not evident
Area extent: _____		Depth: _____	
Remarks: _____			
4.	Discharge Structure	☐ Functioning	☐ N/A
Remarks: _____			
VIII. VERTICAL BARRIER WALLS		☐ Applicable	☒ N/A
1.	Settlement	☐ Location shown on site map	☐ Settlement not evident
Area extent: _____		Depth: _____	
Remarks: _____			
2.	Performance Monitoring	Type of monitoring: _____	
☐ Performance not monitored			
Frequency: _____		☐ Evidence of breaching	
Head differential: _____			
Remarks: _____			
IX. GROUNDWATER/SURFACE WATER REMEDIES		☐ Applicable	☒ N/A
A. Groundwater Extraction Wells, Pumps and Pipelines		☐ Applicable	☐ N/A
1.	Pumps, Wellhead Plumbing and Electrical		
☐ Good condition ☐ All required wells properly operating ☐ Needs maintenance ☐ N/A			
Remarks: _____			
2.	Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances		
☐ Good condition ☐ Needs maintenance			
Remarks: _____			
3.	Spare Parts and Equipment		
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided			
Remarks: _____			

B. Surface Water Collection Structures, Pumps and Pipelines ☐ Applicable ☐ N/A	
1.	Collection Structures, Pumps and Electrical ☐ Good condition ☐ Needs maintenance Remarks: _____
2.	Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances ☐ Good condition ☐ Needs maintenance Remarks: _____
3.	Spare Parts and Equipment ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks: _____
C. Treatment System ☐ Applicable ☐ N/A	
1.	Treatment Train (check components that apply) ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation ☐ Air stripping ☐ Carbon adsorbers ☐ Filters: _____ ☐ Additive (e.g., chelation agent, flocculent): _____ ☐ Others: _____ ☐ Good condition ☐ Needs maintenance ☐ Sampling ports properly marked and functional ☐ Sampling/maintenance log displayed and up to date ☐ Equipment properly identified ☐ Quantity of groundwater treated annually: _____ ☐ Quantity of surface water treated annually: _____ Remarks: _____
2.	Electrical Enclosures and Panels (properly rated and functional) ☐ N/A ☐ Good condition ☐ Needs maintenance Remarks: _____
3.	Tanks, Vaults, Storage Vessels ☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs maintenance Remarks: _____
4.	Discharge Structure and Appurtenances ☐ N/A ☐ Good condition ☐ Needs maintenance Remarks: _____
5.	Treatment Building(s) ☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair ☐ Chemicals and equipment properly stored

Remarks: _____	
6.	Monitoring Wells (pump and treatment remedy) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ All required wells located ☐ Needs maintenance ☐ N/A Remarks: _____
D. Monitoring Data	
1.	Monitoring Data ☐ Is routinely submitted on time ☐ Is of acceptable quality
2.	Monitoring Data Suggests: ☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining
E. Monitored Natural Attenuation	
1.	Monitoring Wells (natural attenuation remedy) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ All required wells located ☐ Needs maintenance ☐ N/A Remarks: _____
X. OTHER REMEDIES	
If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.	
XI. OVERALL OBSERVATIONS	
A.	Implementation of the Remedy
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions). <u>Most construction specified in the remedial design has been completed. Vegetation is well established and erosion is not an issue. Two areas of the impoundment received regionally sourced mine waste and covered with a temporary 6-inch soil cover while EPA determines if additional material will be brought to these areas prior to placing the full 18 inch fill material.</u>	
B.	Adequacy of O&M
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. <u>Regular inspections assess vegetation, invasives, erosion and general site conditions. Maintenance is performed as needed.</u>	
C.	Early Indicators of Potential Remedy Problems
Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. <u>None noted.</u>	
D.	Opportunities for Optimization
Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. <u>None noted.</u>	

APPENDIX G – SITE INSPECTION PHOTOS



“No trespassing” sign near public trail and on-site wetland.



Off-site public trail near wetland.



Embankment wetland and wedge buttress (right, background).



Staged clean fill.



Pond in low-lying area.



West-facing view across the parking area.



Restored diversion ditch.



Parking area.

APPENDIX H – SURFACE WATER MONITORING DATA

Table H-1: Surface Water Data

Sample Location	Sample Date	Sample ID	Total Cadmium (mg/L)	Dissolved Cadmium (mg/L)	Total Zinc (mg/L)	Dissolved Zinc (mg/L)
			TMDL = 0.0008 mg/L		TMDL = 0.39 mg/L	
Main Flow from OU1 Embankment Wetland	11/10/2011	RF-13	<0.00018	<0.00018	0.0298	0.0263
	4/4/2012	OU1-MF	<0.00018	<0.00018	0.0294	0.0334
	5/17/2012	OU1-MF	<0.00018	<0.00018	0.0153	<0.005
	7/18/2012	OU1-MF	<0.0005	<0.0005	0.00688	<0.005
	4/4/2013	OU1-MF	<0.0005	<0.0005	0.337	0.28
	3/13/2015	OU1-0-SW-PFOU1	<0.0005	<0.0005	0.0143	0.0106
	5/28/2015	OU1-0-SW-PFOU2	<0.0005	<0.0005	0.00578	<0.005
	9/1/2015	OU1-0-SW-PFOU3	<0.0005	<0.0005	0.00522	<0.005
	10/9/2015	OU1-0-SW-PFOU4	<0.0005	<0.0005	<0.005	<0.005
Channel downstream of south diversion ditch pond and upstream of embankment wetland at OU1	8/24/2011	RF 6-2	<0.00018	<0.00018	0.0126	0.0066
	11/10/2011	RF 6-2	<0.00018	<0.00018	0.0788	0.0372
Small seep channel on west side of OU1 embankment wetland	11/10/2011	SC-3a	<0.00018	<0.00018	0.187	0.118
Embankment Wetland	8/18/2011	1	Not sampled	Not sampled	0.0822	0.073

Sample Location	Sample Date	Sample ID	Total Cadmium (mg/L)	Dissolved Cadmium (mg/L)	Total Zinc (mg/L)	Dissolved Zinc (mg/L)
			TMDL = 0.0008 mg/L		TMDL = 0.39 mg/L	
	8/18/2011	2	Not sampled	Not sampled	0.0397	0.0215
	8/18/2011	3	Not sampled	Not sampled	0.101	0.0555
	8/18/2011	4	Not sampled	Not sampled	0.0765	0.0606
	8/18/2011	5	Not sampled	Not sampled	0.0351	0.0134
	4/4/2012	OU1-LP	0.000323	<0.00018	0.0446	0.0276
	4/4/2012	OU1-TS	<0.00018	<0.00018	0.147	0.0834
	7/18/2012	OU1-HWY Pond	<0.0005	<0.0005	0.0094	0.00672
Southern Diversion Ditch	7/18/2012	OU1-RF4	<0.0005	<0.0005	0.0162	0.0144