Appendix A

Richardson Flat OU2
Remedial Investigation/Feasibility Study
Work Plan
Lower Silver Creek, Operable Unit 2,
Richardson Flat Tailings Site
Park City, Utah

EPA Site ID: UT980952840

September 24, 2009

Prepared for:

United Park City Mines
P.O. Box 1450
Park City, UT 84060

Prepared by:

Resource Environmental Management Consultants d.b.a. RMC
8138 South State Street, Suite 2A
Midvale, Utah 84047
Phone: (801) 255-2626
Fax: (801) 255-3266

Richardson Flat OU2
Remedial Investigation/Feasibility Study
Work Plan
Lower Silver Creek, Operable Unit 2,
Richardson Flat Tailings Site
Park City, Utah

September 24, 2009

Prepared for:
United Park City Mines
P.O. Box 1450
Park City, UT 84060

Prepared by:
Resource Environmental Management Consultants d.b.a. RMC
8138 South State Street, Suite 2A
Midvale, Utah 84047
Phone: (801) 255-2626
Fax: (801) 255-3266

Prepared by _____ Date 9/25/2009
Jim Fricke
Resource Management Consultants

Reviewed by _____ Date _____
Kerry Gee
United Park City Mines Company

Reviewed by _____ Date 9/22/2009
Kathryn Hernandez
USEPA Remedial Project Manager

Table of Contents

Figures

Appendices

EXECUTIVE SUMMARY

This Work Plan documents the procedures to be used to conduct a Remedial Investigation/Feasibility Study (RI/FS) at the Lower Silver Creek site designated as Operable Unit 2 (OU2) of the Richardson Flat Tailings Site, Park City, Utah (EPA Site ID: UT980952840). This Work Plan was prepared by Resource Management Consultants, Inc. (RMC) for United Park City Mines Company (United Park). The purpose of the Remedial Investigation/Feasibility Study for OU2 is to investigate the nature and extent of contamination at OU2 and develop and evaluate potential remedial alternatives in an area which includes an approximately 4.5 mile long section of Lower Silver Creek through property owned by multiple property owners. The Site is part of the historic Park City Mining District which contained mining and mineral processing facilities in operation from the late 1800's through 1983.

The primary Contaminants of Concern (COCs) are arsenic, cadmium, lead and zinc found in soil, sediment, surface water and shallow groundwater (Tetra Tech, 2008b) . The sources of contamination at OU2 are related to on-Site tailings and impacts from multiple sources located upstream in the Silver Creek Watershed.

Extensive site characterization has been performed by Tetra-Tech (for the United States Environmental Protection Agency); the United States Geological Survey and the State of Utah. The initial phase of the Remedial Investigation will entail conducting a detailed review of data collected in previous investigations. The results of the data review will be used to determine the gaps in the existing dataset. The second phase of site characterization will entail collecting the necessary field data to fill the data gaps in sufficient detail to define the nature and extent of contamination and prepare the Remedial Investigation Report.

Risk Assessment at OU2 will utilize basic information in the Baseline Human Health and Ecological Risk Assessments conducted for Richardson Flat Tailings Site OU1. Site information will be assessed to determine the applicability of the OU1 Risk Assessments for OU2. Operable Units 1 and 2 contain like and similar wastes and are located adjacent to each other. In the unlikely event that the results of the RI indicate a significant difference in Site conditions between OU1 and OU2, additional Risk Assessment work will be conducted.

The information presented in the Remedial Investigation Report and Risk Assessments will be used to conduct a Remedial Feasibility Study. The Feasibility Study (FS) will develop and screen remedial technologies and process options as required by the NCP. The FS will include a detailed analysis of potential remedial alternatives and rank them according to the nine criteria specified by the National Contingency Plan. The Feasibility Study will present a Preferred Alternative based on the detailed analysis of potential remedial alternatives.

1.0 INTRODUCTION

This Remedial Investigation/Feasibility Study Work Plan is presented to describe procedures to complete a Remedial Investigation/Feasibility Study (RI/FS) at Operable Unit 2 of the Richardson Flat Tailings Site, Lower Silver Creek (the Site). This Work Plan was prepared pursuant to the "Administrative Settlement and Order on Consent for Remedial Investigation/Feasibility Study for Lower Silver Creek, Operable Unit 2, Richardson Flat Tailings Site, Park City, Utah EPA Site ID: UT980952840" (AOC). The Respondent did not own or operate any of the historic operations located on-Site.

The Site is located two miles east of Park City, in Summit County, Utah. The Site is part of the Silver Creek Watershed. Mining operations around Park City and in the Silver Creek Watershed included mining of approximately 13 million tons of ore between 1875 and 1981. The Site extends approximately 4.5 miles along the banks of Silver Creek from U. S. Highway 40 on the southern end of the Site downstream to Interstate 80 on the northern end of the Site. A Site Location Map is presented in Figure 1-1.

This Work Plan describes current knowledge about the Site and its history, summarizes investigation and characterization work completed to date, presents potential pathways of contaminant migration and describes the additional investigative, risk assessment, feasibility study and community relations work to be performed. This Work Plan also presents a description of the anticipated reports and deliverables and a project schedule.

This Work Plan has been prepared to meet the requirements for RI/FS Work Plans as described in "Interim Final Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, EPA 540/G-89-004" (EPA, 1988). The Work Plan was prepared following the Statement of Work presented in the OU2 AOC. The Work Plan includes the following sections:

Section 1 – Introduction
Section 2 – Site Background and Setting
Section 3 – Initial Evaluation
Section 4 – Work Plan Rational
Section 5 – RI/FS Tasks
Section 6 – Costs and Key assumptions
Section 7 – Schedule
Section 8 – Project Management
Section 9 – References

1.1 Objectives

The Site has been the subject of previous investigative work conducted by the State of Utah and EPA. Therefore, the initial investigative focus of this Work Plan is to address identified data gaps and assessment work required to complete the RI/FS. Previous investigative studies at the Site have been prepared by:

- Tetra-Tech, for the United States Environmental Protection Agency;
- The United States Environmental Protection Agency;
- The United States Geological Survey;
- The State of Utah; and
- United Park City Mines Company.

A listing of applicable studies is presented in Section 3.0.

The following general RI/FS objectives are defined in the AOC:

- Determine the nature and extent of contamination and any threat to public health, welfare, or the environment caused by the release or threatened release of hazardous substances, pollutants or contaminants at or from the Site.
- Identify and evaluate remedial alternatives to prevent, mitigate or otherwise respond to or remedy any release or threatened release of hazardous substances, pollutants, or contaminants at or from the Site, by conducting a Feasibility Study.

2.0 SITE BACKGROUND AND SETTING

Silver Creek begins in the Wasatch Mountains south of Park City, Utah, and lies within the Weber River Basin in Summit County, Utah. The Site is situated north and east of US Highway 40, bounded by US Highway 40 on its southern end and Interstate 80 to the north (Figure 1-1). It is located in Township 1 South, Range 4 East in Sections 10, 11, 15, 14, 22, 23, 27, 26, and 35. The Rail Trail State Park runs north-south through the Site, paralleling the valley bottom between the floodplain and higher ground to the east. The Rail Trail is a former Union Pacific Railroad rail bed. The Site includes the floodplain and riparian habitat of Silver Creek and a portion of the upland areas immediately adjacent to Silver Creek. A formal Site boundary will be determined as part of the RI/FS. A preliminary boundary, however, has been determined through the work performed by Tetratech for EPA. This boundary is also the subject of a Summit County overlay zone addressing certain aspects of the contamination as it relates to potential development. The region has experienced significant development.

In some reaches, Silver Creek is a perennial stream draining the Wasatch Mountains fed by precipitation including snowmelt and stormwater runoff. Silver Creek is classified for beneficial

use Class 3A for the protection of cold water fish and cold water species (DERR, 2002). Water rights for domestic water, stock, irrigation, and recreation are held by public and private entities in Silver Creek. Portions of the Site are flood irrigated, and the stream flow quantities are impacted by irrigation, at times taking the majority of water out of Silver Creek. Irrigation return flows to Silver Creek may create impacts to water quality. Several irrigation ditches have been constructed in the Site. United States Geological Survey (USGS) stream flow gauging station 10129900 is located within the Site downstream of the Snyderville Water Reclamation Facility outfall.

The Site is located within a complex fold and thrust belt later intruded and overlain by volcanic rocks. The area located within the Silver Creek floodplain is composed of colluvium and alluvium derived from sedimentary and volcanic formations located within the Silver Creek watershed. Wetland and upland areas within the Site are generally underlain by the Keetley Formation volcanic rocks which may be more than 1,000 feet thick (Weston, 1999, in RMC, 2004a).

The Site is composed of wetland and upland habitats and plant communities. Currently there are no residential properties or populations residing within the Preliminary Site Boundary.

2.1 Upstream Sources of Tailings and Metals Loading

Some of the sites upstream of Richardson Flat have impacted surface water and sediment conditions below Richardson Flat (EPA, 2005). These areas have the potential to re-impact OU2 if remediation is not conducted in an upstream to downstream direction in the Silver Creek watershed. Impacted areas located upstream of OU2 include but are not limited to:

Empire Canyon

Empire Canyon is a CERCLIS site which was closed through a non-time critical removal action. It is an ephemeral drainage located upstream from Park City and is the location of historic mine sites and mineral facilities. Prior to remediation efforts, it was identified as a possible source of contamination through work conducted through the Upper Silver Creek Watershed Stakeholders Group. Empire Canyon typically flows from April through mid-July. A Removal Action was recently completed in Empire Canyon the overall objective of which was to reduce surface water contact with contaminated materials resulting in decreased sediment loading and dissolved metals loading to Silver Creek.

Judge Tunnel

The Judge Tunnel is currently a drinking water source for Park City. Water is discharged from the Judge Tunnel when turbidity levels reach a certain level or when the quantity of water flowing in the tunnel exceeds the demand of the drinking water system. High turbidity generally occurs when workers are in the tunnel or during high runoff that occurs in the spring and early summer. Low demand can occur at any time but appears to be most frequent in the morning. Judge Tunnel discharge water currently exceeds Silver Creek TMDL limitations.

Prospector Square

Prospector Square, a large residential and commercial development in the northeast part of Park City, was partially constructed on a large deposit of mill tailings. Prospector Square is located along Silver Creek about 1½ mile upstream from the Richardson Flat Tailings Site (ATSDR, 1988). Prospector Square groundwater is discharged by a pipe (typically referred to as the Prospector Drain) recommended to be installed by Dames and Moore to allow the tailings to dry out and houses to be built. During the 2002 USGS study conducted for the Silver Maple Claims, the USGS determined that the greatest mass loading of zinc in Silver Creek occurred at the Prospector Drain (USGS, 2002) which is located at the downstream end of Prospector Square. A passive biotreatment system was constructed in 2008 to treat a portion of the Prospector Drain discharge. However, a bypass vault was constructed in the event the flow exceeds the treatment capacity (PCMC, 2009). RMC estimates the biotreatment system only treats approximately 10 gallons per minute (gpm) of the Prospector Drain water. There has been no assessment of the impacts to Silver Creek from stormwater or snowmelt collected by residential infrastructure and discharged into Silver Creek particularly during a storm event. Prospector Square was the site of the Graselli Chemical Company (Graselli) mill. Graselli operated a processing facility that processed mill tailings and other materials to capture zinc to be used in paint pigments. Other entities operated the mill as well. It appears that spent waste materials from the facility were discharged directly into Silver Creek on lands downstream of Prospector Square.

Middle Reach

This area includes the reach of Silver Creek from the Prospector Drain to Richardson Flat OU1. It includes the Floodplain Tailings on the downstream end, Silver Maple Claims on the upstream end and other unnamed lands that are potential sources (areas of tailings). Multiple entities own or control lands in the Middle Reach.

Silver Maple Claim – The Silver Maple Claim area consists of land owned by the United States Bureau of Land Management (BLM). It begins at the Prospector Drain and continues downstream for approximately 2,155 feet. The Silver Maple Claim was assessed as part of a

USGS metals loading study (USGS, 2002) for a reach of Silver creek beginning at the Prospector Drain and extending about to a point where Silver Creek is crossed by U.S. 40. The results of the study indicate that the Silver Maple Claims site increases the metals load to Silver Creek. This parcel is the site of the Beggs Mill. This was a small processing facility that processed mill tailings and other materials. It appears that the waste material from this facility was discharged directly into Silver Creek.

Floodplain Tailings - The Floodplain tailings area is located directly upstream from Richardson Flat OU1 and OU2 in between State Route 248 and Us Highway 40. The Floodplain tailings area consists of an area of exposed tailings incised by Silver Creek Directly upstream from Richardson OU1. Its proximity to Silver Creek and data collected during the Richardson Flat RI/FS process indicates that the Floodplain Tailings as a possible source of contamination to Silver Creek.

Richardson Flat OU1

Silver Creek flows through the wetland area westerly of the main embankment of the Richardson tailings pond (Embankment Wetland). Remediation of this area is planned for the 2010/2011 construction season as part of the Richardson Flat RD/RA construction. Historical sampling completed as part of an NPDES permit requirement for the Ontario Mine operations tailings pond indicated that zinc levels in the South Diversion Ditch at times exceeded the current TMDL. Mitigation work completed in the early 1990's help correct this problem. Data collected since 2001 indicates that surface water emanating from the South Diversion Ditch in OU1 meets water quality standards and is diluting Silver Creek surface water metals concentrations (RMC, 2004a).

2.2 Site History

Mining in the Park City area began around 1869. The first shipment of ore, 40 tons, was shipped by wagon in July 1870 (DERR, 2002). Multiple mills operated along the banks of Silver Creek throughout the history of mining in Park City. The majority of milling companies were located upstream of Lower Silver Creek (DERR, 2002).

Tailings from the mining operations, and believed by EPA to have washed downstream and deposited in over-bank deposits in the floodplain throughout the Silver Creek Watershed including the Site. Irrigation diversions may also have spread the tailings and/or impacted Silver Creek waters to areas outside the floodplain (DERR, 2002).

No mining occurred on-Site. Mineral processing at the Site included the Big Four Mill, located near the present Pivotal Promontory access road, which was the primary mill operating within the Site. The Big Four was reportedly the third largest mill in Utah in 1916, consisting of a two month stockpile of 50,000 tons of ore and the capacity to process 1,800 tons of ore tailings per day (DERR, 2002, in Tetra Tech 2008b). The Big Four tailings field was reportedly 3.5 miles long by 400 to 1,200 feet wide and two inches to eight feet deep (Tetra Tech, 2008b).

3.0 INITIAL EVALUATION AND DATA ANALYSIS

This Section analyzes and evaluates current Site knowledge to describe:

- OU2 physical and biological characteristics;
- Contaminant source characteristics;
- Nature and extent of contamination;
- Contaminant fate and transport; and
- A preliminary assessment of human health and environmental impacts.

3.1 Previous Investigations and Existing Data

This Section lists previously conducted studies that contain data applicable to the OU2 RI/FS. Each study was initially evaluated to determine its applicability to OU2. The RI/FS will conduct a detailed evaluation of these studies to determine existing data gaps and the information required to fill them. Data quality from each source will be evaluated to determine applicability as screening level or definitive.

3.1.1 Richardson Flat OU1 RI/FS

The Richardson Flat Tailings Site (OU1) is currently in its second full year of Remedial Action (RA). Data presented in the following technical reports is applicable to OU2:

- Focused Remedial Investigation Report (RMC, 2004a, OU1 RI);
- Focused Feasibility Study (RMC, 2004a, OU1 FS);
- Screening Ecological Risk Assessment for Richardson Flat Tailings, SRC, 2002;
- Baseline Human Health Risk Assessment for Recreational Visitors at Richardson Flat Tailings, SRC, 2003;
- Record of Decision, Richardson Flat Tailings Site (ROD, EPA, 2005); and
- Remedial Design/Remedial Action Work Plan, Richardson Flat (RMC, 2008).

The data presented in the above described reports is applicable to OU2 for the following reasons:

- Contiguous nature of the two sites, they are connected by Silver Creek which flows beneath State Route 248;
- Like and similar ground conditions, Soils, COCs and materials (e.g. tailings);
- Similar aquatic and terrestrial habitat;
- Similar Remedial Action Objectives; and
- Similar sources of contamination.

3.1.2 Silver Creek Watershed

Data collected as part of the Upper Silver Creek Watershed sampling in 2000 is applicable to the OU2 RI/FS. Directly applicable data is limited to water and sediment samples collected at two locations in the upper reach of OU2. Sampling results are documented in the Following reports:

- Analytical Results for Surface Water Monitoring Activities Conducted May 2000, Addendum to the Sampling and Analysis Plan for Upper Silver Creek Watershed (RMC. 2000a);
- Analytical Results for Surface Water Monitoring Activities Conducted September and November 2000, Addendum to the Sampling and Analysis Plan for Upper Silver Creek Watershed (RMC. 2000b);

The data presented in the above described reports is applicable to OU2 for the following reasons:

- The data was collected within the Site (two locations); and
- The remaining data is applicable in demonstrating upstream impacts.

3.1.3 State of Utah

The State of Utah conducted one study that provides data applicable to the OU2 RI/FS:

- Innovative Assessment Analytical Results Report, Lower Silver Creek, Summit County, Utah. Prepared by the State of Utah Division of Environmental Response and Remediation (DERR, 2002).

One study prepared for the State of Utah contains data applicable to the OU2 RI/FS:

- Silver Creek Total Maximum Daily Load For Dissolved Zinc And Cadmium. Prepared by the Utah Department of Environmental Quality - Division of Water Quality (Baker et al, 2001).

The data presented in the above described reports is applicable to OU2 for the following reasons:

- A portion of the data was collected within the Site; and

- The remaining data is applicable in demonstrating upstream impacts.

3.1.4 Studies Conducted for EPA

Tetra Tech, Inc. (Tetra Tech) conducted work for EPA Region 8 in the Lower Silver Creek watershed. The following reports contain data and information applicable to the OU2 RI/FS:

- Field Sampling Plan for Upper and Lower Silver Creek Summit County, Utah (Tetra Tech, 2008a).
- Draft Lower Silver Creek Data Summary Report (Tetra Tech, 2008b).
- Lower Silver Creek Wetland Delineation Park City, Utah (Tetra Tech, 2008c).
- Reactive Transport Modeling under High Flow Conditions for Cadmium and Zinc, Lower Silver Creek, Utah (Tetra Tech, 2008d).

The data presented in the above described reports is applicable to OU2 for the following reason:

- The data was collected within the Site.

3.1.5 Studies Conducted by EPA

One report prepared by EPA provides data applicable to the OU2 RI/FS:

- Data Interpretation Report, Upper Silver Creek Watershed Surface Water/Stream Sediment Monitoring 2000 (EPA, 2001).

The data presented in the above described reports is applicable to OU2 for the following reasons:

- A limited portion of the data was collected within the Site; and
- The remaining data is applicable in demonstrating upstream impacts.

3.1.6 Studies Conducted By United States Geological Survey

The United States Geological Survey (USGS) has conducted two studies with data that is applicable to Lower Silver Creek:

- Trace-Metal Concentrations in Sediment and Water and Health of Aquatic Macroinvertebrate Communities of Streams Near Park City, Summit County, Utah (USGS, 2001)
- Quantification of Metal Loading to Silver Creek Through the Silver Maple Claims Area, Park City, Utah (USGS, 2002).

The data presented in the above described reports is applicable to OU2 for the following reasons:

- The reports contain data collected within the Site; and

- The reports contain data applicable in demonstrating upstream impacts.

3.2 Type and Volume of Waste Present

This Section summarizes the type and volume of waste present and the potential pathways of contaminant migration.

3.2.1 Types of Waste Present

The chemicals of concern (COCs) at OU2 are zinc, cadmium, lead, and arsenic (Tetra Tech, 2008b). The media affected by these contaminants are surface water, groundwater, sediment and soils (Tetra Tech, 2008b). Waste present at the Site consists of mine processing waste impacted soils and sediment. The contamination is primarily composed of mill tailings containing elevated concentrations of zinc, cadmium, lead and arsenic that are generally located in the Silver Creek Floodplain.

Studies conducted by the EPA and State of Utah indicated high maximum concentrations of lead (61,822 mg/kg), arsenic (6,696 mg/kg), zinc (169,890 mg/kg) and cadmium (295 mg/kg) in certain soils within the Site. The range of concentrations found on-Site likely range from local background values to the described maximums.

3.2.2 Volume of Waste Present

As stated in the AOC, EPA estimates that there are 1,479,000 cubic yards of mining waste, extending over 400 acres along the floodplain of the Silver Creek within OU2, including wetlands. Data collected as part of the RI/FS will confirm this estimate and if necessary provide a more accurate representation of on-Site waste volumes and their spatial distribution.

Within the initial Site boundary there are two primary tailings deposit areas of concern, the Atkinson Tailing Deposit and the Big Four Exploration Company Tailing Deposit. On-Site contamination is also due to the historic on-Site operation of the Big Four Mill, which reprocessed tailings washed down from the upper Silver Creek watershed. The Respondent did not own or operate the Atkinson Tailing Deposit, Big Four Tailing Deposit, or the Big Four Mill. The extent of these areas and the associated volumes of waste have not been determined at this time.

The Site is adjacent to and downstream of Richardson Flat OU1, separated by Utah State Route 248. According to the OU1 Record of Decision, OU1 was, immediately prior to the commencement of remedial activities, only a minor contributor to the current level of metal contamination in Silver Creek (ROD for OU1, Section 5.6.1).

3.3 Potential Pathways of Contaminant Migration and Preliminary Public Health and Environmental Impacts

Based on existing data, including the Risk Assessment conducted at OU1, respondent has identified three potential contaminant migration pathways: air, groundwater and surface water.

The Baseline Human Health Risk Assessment for Recreational Visitors at Richardson Flat Tailings (BHHRA, SRC, 2003) conducted for OU1 concluded that "*For all evaluated scenarios (low intensity, high intensity, CTE, RME) non-cancer risks are below a hazard Index of one. Additionally, all cancer risks were estimated to be within USEPA's acceptable risk range of one in a million to one in 100,000*". These findings should be analogous for recreational users in OU2.

3.3.1 Air

This pathway is associated with potential releases to air by wind-blown tailings. Releases to air have not been documented at OU2. With the exception of two mounds of tailings located just north of Highway 248. All contamination is covered by vegetation and the potential release of contaminants to the air pathway would be considered minimal.

This pathway has been reduced because the tailings are currently protected with a vegetative cover. The remaining minor areas of exposed tailings would present only a de minimus potential for migration through the air pathway.

Potential human health and environmental impacts include:

- Direct contact with tailings; and
- Uptake through ingestion.

The OU2 RI/FS will determine whether additional remedial measures are necessary to prevent further contaminant migration.

3.3.2 Groundwater

This pathway is associated with potential releases to groundwater as the result of leaching of metals from the tailings and hydraulic connectivity between saturated tailings and Site groundwater systems (both shallow and deep). The primary sources of contamination to groundwater in OU2 include contamination from upstream sources and substances leached from on-Site tailings. Upstream sources include the Judge Tunnel, Prospector Drain and Middle Reach as documented in Section 2.1. The potential exposure for terrestrial or aquatic biota would be ingestion of surface water and/or sediments that have been affected by contaminated

shallow groundwater in areas of upward hydraulic gradients. The primary exposure for Human Health would be the ingestion of shallow groundwater, which is not currently being utilized on-Site.

The results of Site studies conducted for EPA (Tetra Tech, 2008b) indicate that the groundwater quality observed in shallow piezometers screened within the tailings had much higher metals concentrations than in those screened below the tailings. Data collected as part of the OU1 RI indicated a low potential for downward leaching (RMC, 2004a). The low potential for downward leaching as demonstrated in OU1 is confirmed by on-Site data in OU2. Therefore, in a situation analogous to OU1, the downward leaching of contaminated groundwater into the deep bedrock aquifer is not expected to be a significant pathway.

Work conducted in OU1 (RMC, 2004a) indicated that the potential for the migration of contaminants to groundwater supplies used for drinking water sources is minimal as evidenced by:

- Data collected as part of the OU1 RI indicated a low potential for downward leaching as evidenced by low metals concentrations in native soils underlying the tailings.
- There is no apparent hydraulic connection between groundwater stored in the tailings and the underlying aquifer(s) within the Keetley Volcanic rocks developed as a groundwater supply by downstream Public Water Systems (MWH Americas Report Appendix 5, in OU1 RI, RMC, 2004a).
- Water quality samples collected from Public Water System wells tapping the Keetley Volcanic rocks along the Silver Creek Drainage meet Utah Division of Drinking Water Standards (MWH Americas Report Appendix 5, in OU1 RI, RMC, 2004a).

Potential human health and environmental impacts include:

- Ingestion of groundwater; and
- Ground to surface water contamination.

Previously collected data (Section 3.1) and any additional data, if required, will be used in the OU2 RI to determine the potential impacts to shallow and deep groundwater located beneath the Site. The OU2 RI/FS will determine potential remedies to mitigate any potential groundwater impacts.

3.3.3 Surface Water

This pathway is associated with release to surface water as the result of leaching of metals from the tailings materials. The potential exposure for terrestrial or aquatic biota would be ingestion

of surface water that has been impacted by metals. As with groundwater, tailings and upstream sources are the primary potential source of contamination to surface water. Surface water has the potential to come into direct contact with tailings.

Upstream sources include the Judge Tunnel, Prospector Drain and Middle Reach as documented in Section 2.1. Water quality at collected at OU1 since at least 2001 indicates that water discharging from the South Diversion Ditch is diluting upstream contamination as it enters Lower Silver Creek (RMC, 2004a).

Potential human health and environmental impacts include:

- Direct contact by aquatic species;
- Potential ingestion of surface water; and
- Incidental dermal exposures related to potential splashing and wading during warm weather.

The OU2 RI will include, if needed, surface water investigations as required to fill in existing data gaps and further evaluate Site conditions sufficiently to determine any potential impacts to receptors. The OU2 RI will determine potential remedies to mitigate any potential surface water impacts.

3.4 Preliminary Identification of Operable Units

The Site is being managed as one Operable Unit, Richardson Flat Tailings Site OU2. The Lower Silver Creek Site is located immediately downgradient from Richardson Flat Tailings Site OU1.

3.5 Project Scoping Summary

This Section presents the initial Remedial Action Objectives and describes the range of Potential Remedial Action Alternatives for the Site.

3.5.1 Preliminary Identification of Remedial Action Objectives and Alternatives

The preliminary Remedial Action Objectives for the Site include:

Surface Water

- Reduce risks to aquatic receptors in the channel and associated wetland areas.
- Attempt to bring Lower Silver Creek into compliance with Utah water quality standards.
- Allow for a variety of future recreational uses; and
- Control of contaminant migration in surface water to the extent practical.

Groundwater

- Eliminate future groundwater use and withdrawal at the Site: and
- Control of contaminant migration in groundwater to the extent practical.

Sediments

- Reduce risks to wildlife receptors in the channel and wetland areas such that hazard indexes for lead are less than or equal to one; and
- Control contaminant migration in sediments to the extent practical.

Tailings and soils

- Control contaminant migration in soils to the extent practical;
- Minimize risks of lead and arsenic exposure to recreational users.
- Allow for a variety of future land uses; and
- Minimize post-cleanup disturbance of tailings and contaminated soil. Provide controls for ensuring any necessary disturbance is controlled.

The above-described preliminary Remedial Action Objectives are consistent with the OU2 AOC and Statement of Work.

3.5.2 Remedial Action Alternatives

Remedial alternatives for the Site will be developed and screened following the completion and EPA acceptance of the OU2 RI report. The screening will be conducted as part of the OU2 FS and will evaluate methods that reduce toxicity, mobility and the volume of waste to provide adequate protection of human health and the environment. Potential remedial options will range from No Action, as specified by the National Contingency Plan (NCP), to options including removal, containment and treatment.

The OU2 RI/FS will present a detailed comparative analysis of alternatives based on the nine criteria as specified by the NCP:

- Overall protection of human health and the environment;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility and volume through treatment;
- Compliance with ARARs;
- Short-term effectiveness;
- Implementability;
- Cost;
- State acceptance; and
- Community acceptance.

The comparison and selection of a preferred alternative will be presented in the OU2 FS report.

3.5.3 Preliminary Identification of Potential ARARs

The RI/FS report will contain a site characterization summary that will evaluate remedial alternatives and the refinement and identification of federal and state applicable or relevant and appropriate requirements (ARARs). The RI/FS will describe chemical specific, location specific and action specific ARARs. The draft RI Report will complete a site characterization summary that will assist in evaluating the development and screening of remedial alternatives and refinement and identification of ARARs.

4.0 WORK PLAN RATIONALE

This section details the rationale used to conduct the activities to implement an RI/FS for OU2 with sufficient detail to characterize the Site and determine a range of remedial alternatives.

4.1 Data Quality Objective Needs

Data quality needs will be identified by evaluating the existing data and determining what additional data are necessary to:

- Characterize the Site with sufficient detail to complete the RI/FS;
- Develop a sufficient conceptual understanding of the Site;
- Define ARARs;
- Narrow the range of remedial alternatives that have been identified; and
- Select an appropriate Remedial Alternative that meets NCP criteria.

4.2 Work Plan Approach

The approach of this Work Plan is based on using the extensive existing data set to perform an initial characterization of the Site. The initial site characterization will assess the spatial distribution and quality of the existing data. The project team will use the results of the initial site characterization to determine the need for additional data collection.

The collection of additional data, if required, will follow the Triad Approach as described in Improving Sampling, Analysis and Data Management for Site Investigation and Cleanup (EPA, 2001). The Triad approach allows for flexibility in data collection.

The Risk Assessment approach to be used in this investigation relies on the work conducted for the OU1 Ecological and Human Health Risk assessments conducted by EPA. The OU1 Human Health and Ecological Risk Assessments will be reviewed to determine applicability to OU2. Specifically, the existing documents will be reviewed in light of what we currently know about Lower Silver Creek, to determine whether the two areas would be expected to have similar land uses, and/or ecological habitat. Based on this review, United Park will provide a report documenting how the existing assessments are applicable to OU2. In the case that additional Risk Assessments need to be performed, they will be conducted in accordance with applicable EPA guidance as described in Section 5.1.

Data collected as part of the RI/FS will determine the applicability of Treatability Studies (if required). Work conducted as part of the OU1 RI/FS determined that Treatability Studies were not required to meet the requirements of the Remedial Action. If data collected for OU2 determines that Treatability Studies are applicable for the Site they will be incorporated into the Feasibility Study portion of the RI/FS.

Potential Preliminary Remedial Alternatives range from No-Action (as required by the NCP) to Full removal of contaminants. The anticipated preferred Remedial Alternative will include isolating contaminants from surface and groundwater and protection of human health by reducing the potential for direct contact and selection of appropriate land uses. A detailed screening of Remedial Alternatives will be conducted in the RI/FS.

All work conducted by this RI/FS will be conducted in accordance with applicable EPA guidance.

5.0 RI/FS TASKS

The tasks to be completed by the RI/FS include the following 14 RI/FS Work Plan Standard Tasks (EPA, 1988);

1. Project Planning;
2. Community Relations;
3. Field Investigation (This task will include an evaluation of existing data);
4. Sample Analysis/Validation;
5. Data Evaluation;
6. Risk Assessment (Based on the results of OU1 Risk Assessments);
7. Treatment Study/Pilot Testing (if required, not anticipated based on work conducted at OU1);
8. Remedial Investigation(RI) Reports;
9. Remedial Alternatives Development/Screening;
10. Detailed Analysis of Alternatives;

11. Feasibility Study (FS) Reports (This will include Tasks 8 and 9);
12. Post RI/FS Support;
13. Enforcement Support; and
14. Miscellaneous Support.

5.1 Deliverables

This Section documents the deliverables to be prepared as part of the RI/FS. Deliverables will be submitted to EPA for review and approval pursuant to Section X (EPA Approval of Plans and Other Submissions) of the AOC. United Park will submit the following deliverables:

Quarterly Progress Reports

United Park will submit Quarterly Progress Reports on the 15th day of the month following each quarter. At a minimum, with respect to the quarter, these progress reports shall: (1) describe the actions which have been taken to comply with the Settlement Agreement during that quarter; (2) include all results of sampling and tests and all other data received by United Park;, (3) describe work planned for the next quarter; and (4) describe all problems encountered and any anticipated problems, any actual or anticipated delays, and solutions developed and implemented to address any actual or anticipated problems or delays.

Sampling and Analysis Plan

Within 30 days prior to plan start date of field work as set in writing to EPA, United Park will submit a Sampling and Analysis Plan (SAP) to EPA for review. The SAP shall consist of a Field Sampling Plan ("FSP") and a Quality Assurance Project Plan ("QAPP"), prepared in accordance with "EPA Guidance for Quality Assurance Project Plans (QA/G-5)" (EPA/600/R-02/009, December 2002 or subsequently issued guidance), and "EPA Requirements for Quality Assurance Project Plans (QA/R-5)" (EPA 240/B-01/003, March 2001 or subsequently issued guidance).

Site Health and Safety Plan

Within 30 days prior to planned start date of field work as set in writing by EPA, United Park will submit for EPA review and comment a Site Health and Safety Plan (HASP) that ensures the protection of on-site workers and the public during performance of on-Site work under this Settlement Agreement. This plan shall be prepared in accordance with EPA's Standard Operating Safety Guide (PUB 9285.1-03, PB 92-963414, June 1992 or subsequently issued guidance). In addition, the plan shall comply with all currently applicable Occupational Safety and Health Administration (OSHA) regulations found at 29 C.F.R. Part 1910. If EPA determines

that it is appropriate, the plan shall also include contingency planning. United Park will incorporate all changes to the plan recommended by EPA and shall implement the plan during the RI/FS.

Community Relations Plan

EPA will prepare a community relations plan, in accordance with EPA guidance and the NCP. As requested by EPA, Respondent shall provide information supporting EPA's community relations plan and shall participate in the preparation of such information for dissemination to the public and in public meetings which may be held or sponsored by EPA to explain activities at or concerning the Site.

Baseline Human Health Risk Assessment and Ecological Risk Assessment

United Park will provide a review of the existing Human Health and Ecological Risk Assessments for the Richardson Flat OU1, to determine whether conclusions from those assessments can reasonably be applied to OU2. Based on this review, the existing data summary and any additional data collected (if required), United Park will provide a technical report presenting how the existing assessments could be applicable to OU2. In the case that additional Risk Assessments need to be performed, they will be conducted in accordance with applicable EPA guidance, including but not limited to: "Interim Final Risk Assessment Guidance for Superfund, Volume I-Human Health Evaluation Manual (Part A)," (RAGS, EPA-540-1-89-002, OSWER Directive 9285.7-01A, December 1989); "Interim Final Risk Assessment Guidance for Superfund, Volume I-Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments)," (RAGS, EPA540-R-97-033, OSWER Directive 9285.7-01D, January 1998); "Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments" (ERAGS, EPA-540-R-97-006, OSWER Directive 9285.7-25, June 1997) or subsequently issued guidance

Draft Remedial Investigation Report

Within 60 days after EPA's approval of the OU1 Risk Assessments review and/or additional Risk Assessment reports, United Park will submit to EPA for review and approval, a Draft Remedial Investigation Report consistent with the RI/FS Work Plan and SAP. The Draft RI Report shall also contain the Risk Assessments.

Treatability Studies

Treatability Studies were not required in OU1. Treatability studies are currently being conducted by EPA ORD and if successful may be used to assist in the detailed analysis of alternatives.

Draft Feasibility Study Report

Within 60 days after EPA approval of the OU1 Risk Assessment Applicability Review, United Park will a prepare Draft Feasibility Study (FS) Report which reflects the findings in the Risk Assessments. The FS Report will include detailed development and analysis of alternatives. The FS will be prepared in accordance with Table 6-5 of the RI/FS Guidance for report content and format. The report as amended, and the administrative record, shall provide the basis for the proposed plan under CERCLA Sections 113(k) and 117(a) by EPA, and shall document the development and analysis of remedial alternatives.

6.0 COSTS AND KEY ASSUMPTIONS

Remedial costs have not been determined at the time of Work Plan preparation. The RI/FS work will be conducted by the same project team that is currently conducting work at OU1. The projects team's familiarity with the Site will enable the project team to conduct work in the same cost and time effective manner as OU1.

The use of existing data will also enable the project team to conduct the RI/FS in a cost-effective manner. The initial Site Characterization will identify the scope and quality of existing data, allowing the project team to streamline tasks without the duplication of previously conducted work.

7.0 SCHEDULE

The RI/FS will be conducted in accordance with schedules provided in the AOC and the Deliverables presented in Section 5.1.

Investigative and design tasks associated with the RI/FS can be completed prior to remedial and removal actions in impacted areas located upstream of OU2 (Section 2.1).

8.0 PROJECT MANAGEMENT

Kerry Gee will be the Project Coordinator for United Park and will manage the RI/FS. Environmental consultants at Resource Management Consultants, Inc. (RMC), will assist Mr. Gee where needed. The EPA Project Manager will be Kathryn Hernandez. The State of Utah Department of Environmental Response and Remediation (DERR) Project Manager will be Mo Slam. Analytical analysis will be conducted by American West Analytical Laboratories (AWAL). Site management is presented on Figure 8-1. Appendix A contains the contact information for the RI/FS. All personnel and contractors working with contaminated materials will have appropriate health and safety training including OSHA certification as required by 29 CFR 1910.120.

9.0 REFERENCES

Michael Baker Jr., Inc./ Psomas (Baker et al), 2001, Silver Creek Total Maximum Daily Load For Dissolved Zinc And Cadmium. Prepared For: Utah Division of Water Quality (UDWQ)

Park City Municipal Corporation (PCMC), 2009, Soils Ordinance Area Environmental Management System, 2008 Annual Report

Resource Management Consultants, Inc (RMC), Analytical Results for Surface Water Monitoring Activities Conducted May 2000, Addendum to the Sampling and Analysis Plan for Upper Silver Creek Watershed (RMC, 2000a);

Resource Management Consultants, Inc (RMC), Analytical Results for Surface Water Monitoring Activities Conducted September and November 2000, Addendum to the Sampling and Analysis Plan for Upper Silver Creek Watershed (RMC, 2000b);

Note: The following 2 documents in combination are referred to as the "OU1 RI/FS":

Resource Management Consultants, Inc (RMC), 2004a, Focused Remedial Investigation (RI) Report for Richardson Flat, Site ID Number: UT980952840.

Resource Management Consultants, Inc (RMC), 2004b, Focused Feasibility Study Report (FS) for Richardson Flat, Site ID Number: UT980952840

Resource Management Consultants, Inc (RMC), 2008 Remedial Action/Remedial Design Work Plan, Richardson Flat, Site ID Number: UT980952840.

Syracuse Research Corporation (SRC), 2002, Screening Ecological Risk Assessment for Richardson Flat Tailings, Prepared for: US Environmental Protection Agency, Region 8.

Syracuse Research Corporation (SRC), 2003, Baseline Human Health Risk Assessment for Recreational Visitors at Richardson Flat Tailings, Prepared for: US Environmental Protection Agency, Region 8.

Summit County Historical Society, 2009.
www.summitcounty.org/history/snyderville/atkinson_school.html

Tetra Tech, Inc, 2008a Field Sampling Plan for Upper and Lower Silver Creek Summit County, Utah, Prepared for: US Environmental Protection Agency, Region 8

Tetra Tech, Inc, 2008b, Draft Lower Silver Creek Data Summary Report, Prepared for: US Environmental Protection Agency, Region 8

Tetra Tech, Inc. 2008c, Lower Silver Creek Wetland Delineation Park City, Utah, Prepared for: US Environmental Protection Agency, Region 8

Tetra Tech, Inc. 2008d, Draft Lower Silver Creek, Utah Reactive Transport Modeling under High Flow Conditions for Cadmium and Zinc, Prepared for: US Environmental Protection Agency, Region 8

United States Agency for Toxic Substances and Disease Registry (ATSDR), 1988. Silver Creek Mine Tailings Exposure Study.

United States Environmental Protection Agency (EPA), 1988, Interim Final Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, OSWER Directive # 9355.3-01.

United States Environmental Protection Agency (EPA), 1990. Guidance for Data Useability in Risk Assessment, OSWER Directive #9285.7-05.

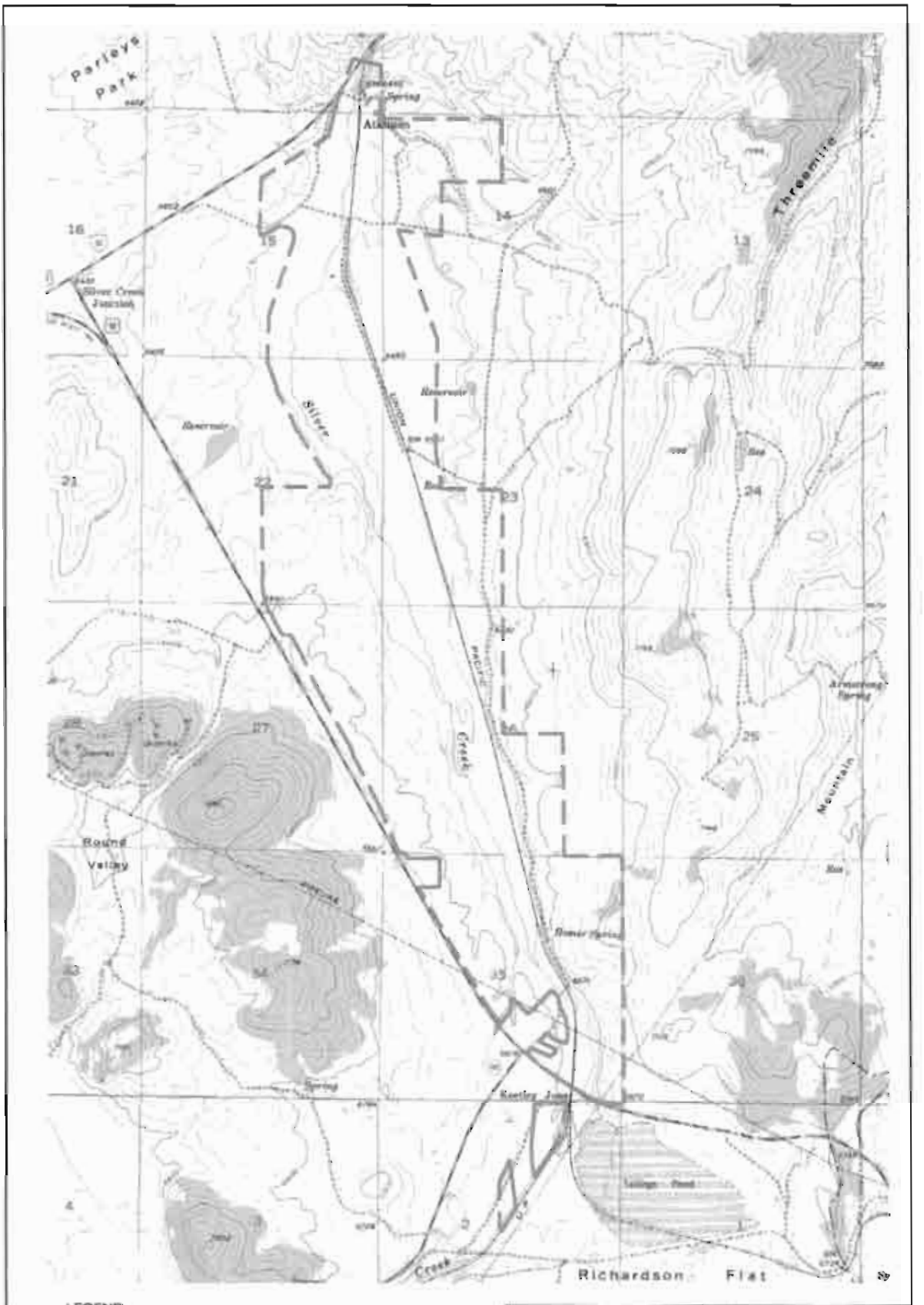
United States Environmental Protection Agency (EPA), 2005, Record of Decision, Richardson Flat Tailings Site.

United States Environmental Protection Agency (USEPA), 2001, Improving Sampling, Analysis and Data Management for Site Investigation and Cleanup, EPA-542-F-01-030a.

United States Geological Survey (USGS), 2001. Trace-Metal Concentrations in Sediment and Water and Health of Aquatic Macroinvertebrate Communities of Streams near Park City, Summit County, Utah, Water-Resources Investigations Report 01–4213

United States Geological Survey (USGS), 2002, Quantification of Metal Loading to Silver Creek Through the Silver Maple Claims Area, Park City, Utah, May 2002, Scientific Investigations Report 2007-5248

Utah Department of Environmental Quality – Division of Environmental Response and Remediation (DERR), 2002, Innovative Assessment Analytical Results Report, Lower Silver Creek, Summit County, Utah." October.



LEGEND

APPROXIMATE OU2 STUDY AREA
(Final study area to be determined during RI/FS)

NOTE: LOCATIONS NOT SURVEYED

UNITED PARK CITY MINES

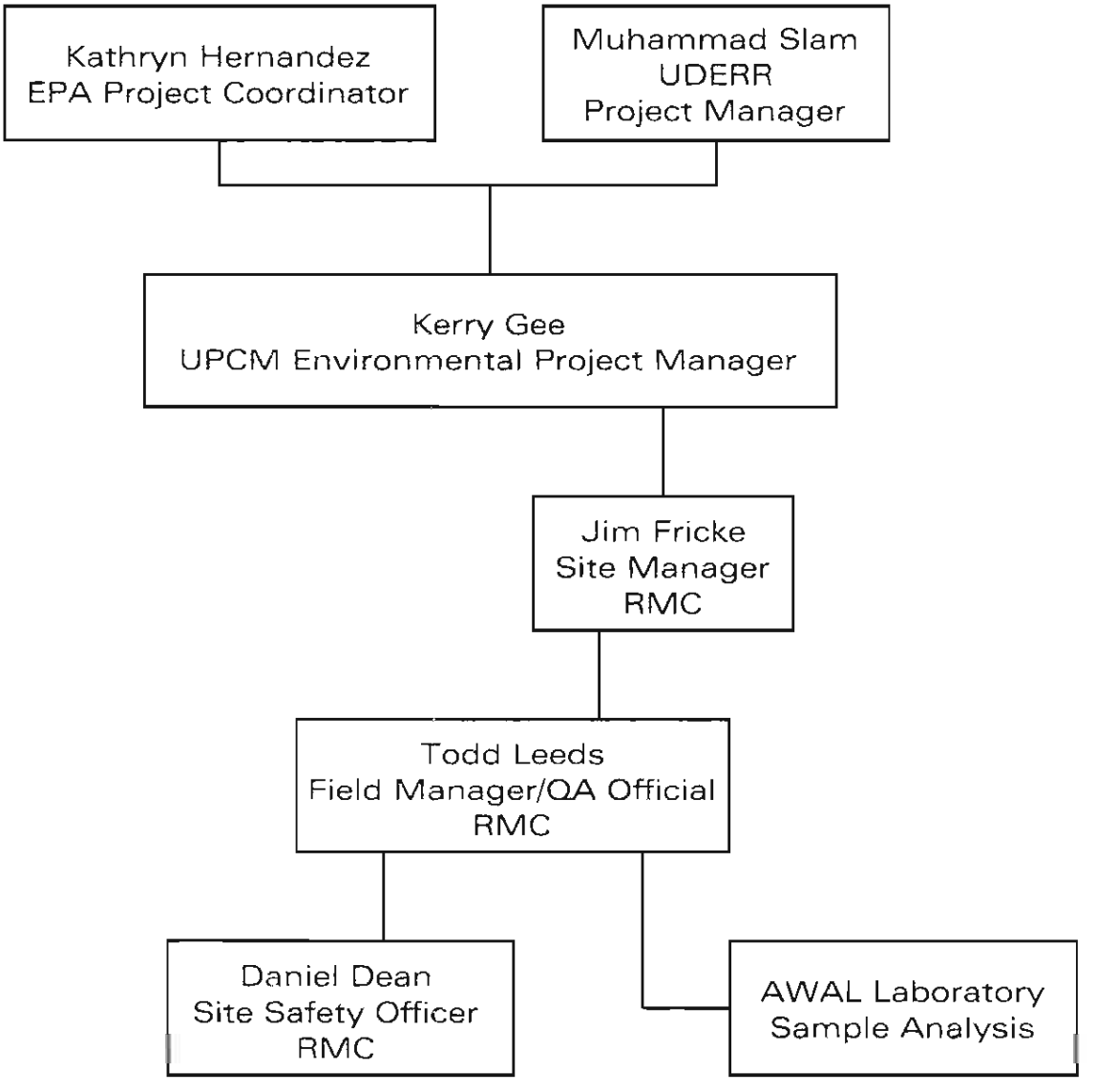
FIGURE 1-1
RICHARDSON FLAT OU2
SITE LOCATION MAP

RESOURCE MANAGEMENT CONSULTANTS
91 SOUTH STATE ST.
SUITE 2A
NEWHALL, UT 84047
801-[illegible]-3555

AUGUST 2009

tsc quads basemap.dwg

FIGURE 8-1 - Richardson Flat OU2 RI/FS Organizational Chart



rfou2-org-chart.dwg

Appendix A
Richardson Flat OU2
Contact Information

EPA:

Kathryn Hernandez
United States EPA
Region 8 Ref: 8EPR-EP
1595 Wynkoop St
Denver, CO 80202

State of Utah DERR:

Muhammad Slam
Utah Division of Environmental Response
& Remediation
168 North 1950 West
1st Floor
Salt Lake City, UT 84116

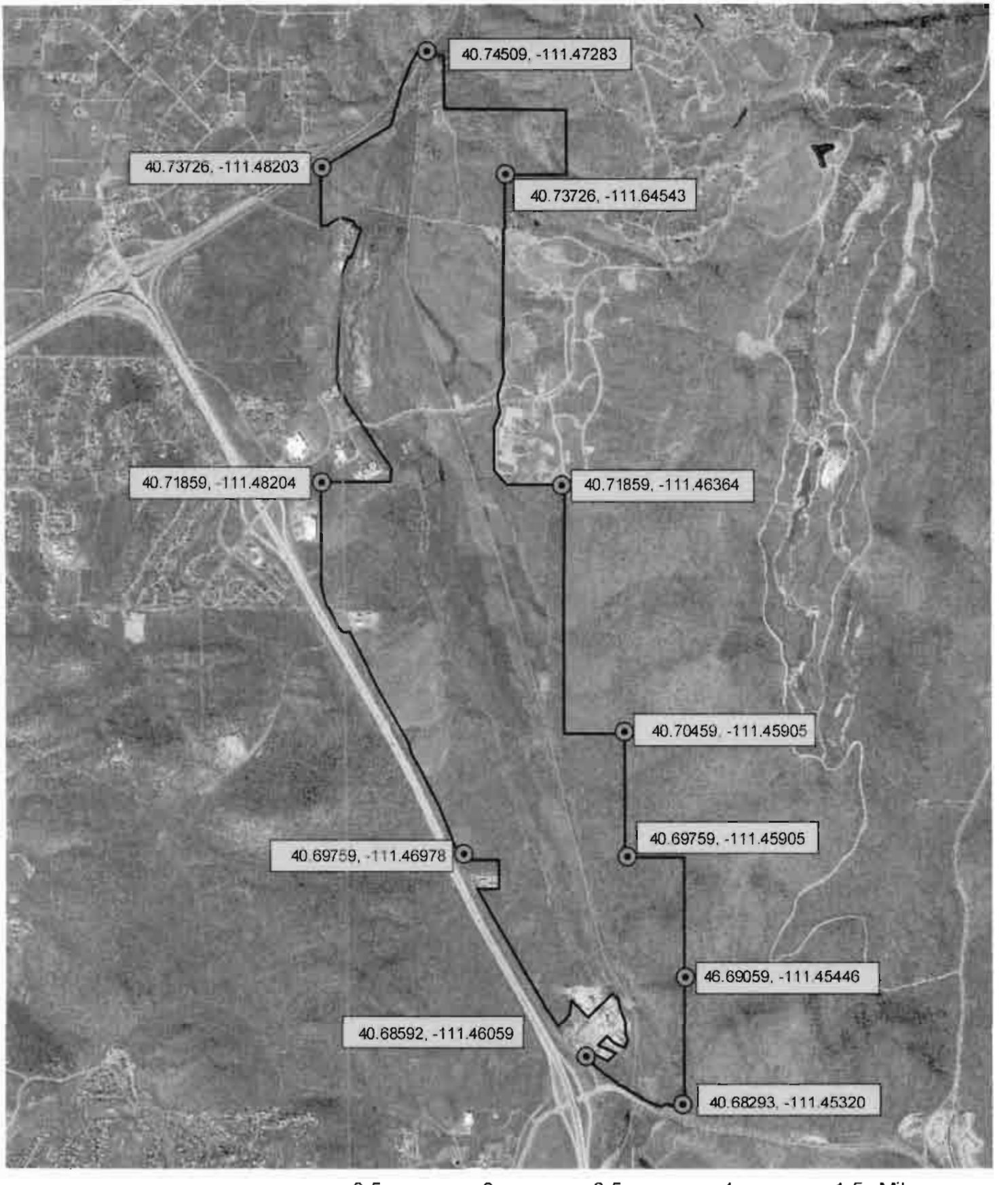
United Park City Mines Company:

Kerry Gee
United Park City Mines
P.O. Box 1450
Park City, UT 84060

Resource Management Consultants, Inc (RMC):

Jim Fricke
RMC
8138 South State Street
Midvale, UT 84047

Appendix B


40.74509, -111.47283
40.73726, -111.48203
40.73726, -111.64543
40.71859, -111.48204
40.71859, -111.46364
40.70459, -111.45905
40.69759, -111.45905
40.69759, -111.46978
46.69059, -111.45446
40.68592, -111.46059
40.68293, -111.45320
0.5 0 0.5 1 1.5 Miles
Project Boundary
Coordinates are presented as Latitude, Longitude in decimal degrees
Lower Silver Creek Project Boundary
Park City, UT
N