

**EPA Superfund  
Explanation of Significant Differences**

**Kennecott North Zone Site**

EPA ID: UTD070926811

Magna, UT

**Kennecott South Zone Site**

EPA ID: UTD000826404

Copperton, UT

Final

August 2017

## Table of Contents

<b>1.0</b>	<b>INTRODUCTION AND STATEMENT OF PURPOSE .....</b>	<b>1</b>
1.1	Site Name and Location .....	1
1.2	Lead and Support Agencies.....	1
1.3	Legal Authority for Explanation of Significant Differences.....	1
1.4	Summary of Purpose .....	2
1.5	Administrative Record .....	2
<b>2.0</b>	<b>SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY .....</b>	<b>3</b>
2.1	Site History.....	3
2.2	Contamination .....	4
2.3	Summary of the Selected Remedy from the ROD .....	5
2.3.1	Bingham Creek ROD .....	5
2.3.2	Groundwater ROD .....	6
2.3.3	Butterfield ROD .....	6
2.3.4	Kennecott North Zone and South Zone ROD .....	7
<b>3.0</b>	<b>BASIS FOR THE ESD .....</b>	<b>9</b>
<b>4.0</b>	<b>DESCRIPTION OF DIFFERENCES BETWEEN THE ROD REMEDY AND THE CLARIFIED REMEDY .....</b>	<b>10</b>
4.1	Remedy Scope.....	10
4.1.1	Bingham Creek ROD, dated November 3, 1998.....	10
4.1.2	Groundwater ROD, dated December 13, 2000, and subsequent ESDs in June 2003 and June 2007 .....	11
4.1.3	Butterfield ROD, dated September 28, 2001 .....	11
4.1.4	Kennecott North Zone and South Zone ROD, dated September 26, 2002 .	11
4.2	Performance .....	12
4.3	Cost.....	12
<b>5.0</b>	<b>SUPPORT AGENCY COMMENTS.....</b>	<b>12</b>
<b>6.0</b>	<b>STATUTORY DETERMINATIONS .....</b>	<b>13</b>
<b>7.0</b>	<b>PUBLIC PARTICIPATION REQUIREMENTS .....</b>	<b>13</b>
<b>8.0</b>	<b>AUTHORIZING SIGNATURES .....</b>	<b>14</b>
Appendix A:	Maps.....	A-1
Appendix B:	Technical Memorandum Compilation of soil and groundwater action levels, December 29, 2015.....	B-1
Appendix C	References.....	C-1

## **1.0 INTRODUCTION AND STATEMENT OF PURPOSE**

### **1.1 Site Name and Location**

Site Name: Kennecott North Zone

Site Location: Magna, Utah

Site ID: UTD070926811

Site Name: Kennecott South Zone

Site Location: Copperton, Utah

Site ID: UTD000826404

### **1.2 Lead and Support Agencies**

The U.S. Environmental Protection Agency (EPA) is the lead agency for both the Kennecott North and South Zone Sites for Explanations of Significant Differences (ESDs). The Utah Department of Environmental Quality (UDEQ) is the supporting agency for ESDs.

### **1.3 Legal Authority for Explanation of Significant Differences**

This ESD is issued in accordance with section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act, (CERCLA) as amended, 42 U.S.C. 9617(c) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Section 300.435(c)(2)(i). This ESD clarifies four Records of Decisions (RODs) for all Operating Units (OUs) at both the Kennecott North and South Zones:

- November 3, 1998 Bingham Creek ROD
  - OU1 – Bingham Creek
  - OU4 – Bingham Reservoirs (f/k/a Large Bingham Reservoir)
  - OU5 – ARCO Tailings
  - OU10 – Copperton Soils
  - OU11 – Bingham Canyon Historic Facilities
  - OU17 – Bastian Sink
- December 13, 2000 South End Groundwater ROD
  - OU2 – Southwest Jordan River Valley Ground Water Plumes
  - OU12 – Water Collection System (f/k/a Eastside Collection System)
  - OU16 – Bingham Canyon Underflow (f/k/a/Bingham Creek Underflow)
- September 28, 2001 Butterfield ROD
  - OU3 – Butterfield Canyon and Herriman
  - OU6 – Lark Waste Rock and Tailings
  - OU7 – South Jordan Evaporation Ponds
- September 26, 2002 Kennecott North and South Zone ROD
  - OU8 – Waste Water Treatment Plant and Sludge Ponds
  - OU9 – Magna Soils
  - OU13 – Smelter and Acid Plants
  - OU14 – Refinery
  - OU15 – Mills and Tailings Pond
  - OU18 – Mine Drainage Tooele County (f/k/a Acid Mine Drainage)
  - OU19 – Smelter Fallout
  - OU22 – Great Salt Lake, Shoreline Wetlands

- OU23 – North End Groundwater
- OU24 – Precipitation Plant
- OU25 – Kennecott Historic Sites (This OU was defined in a technical memorandum dated 2/5/2016 and captures the sites and remedies listed in Table 12.3 of the ROD that are also included in other OUs)

The clarifications described in this ESD significantly change, but do not fundamentally alter the original remedy selected in the RODs issued by the EPA, with respect to scope, performance, or cost. This ESD is administrative and is intended to clarify the institutional controls (ICs) that were expected at the time of the above RODs based on then-existing and reasonably anticipated land use.

#### 1.4 Summary of Purpose

Five-year reviews were completed in June 2014 for the North Zone (OUs 8, 9, 13, 14, 15, 19, 22, and 23), and in May 2016 for the South Zone (OUs 1, 2, 3, 4, 5, 6, 10, 11, 12, 16, 18, 20, and 24). Previous five-year reviews were completed for the South Zone, specifically in September 2009 for OUs 3, 6, 7, 17, and 18, and in September 2010 for OUs 1, 4, 5, 10, and 11. A five-year review for all OUs at the North Zone will be due in 2019. The previous five-year reviews recommended changes to the selected remedies to ensure protectiveness in both the short and long term. This ESD clarifies the selected remedies by addressing mapping, ICs, and operation and management (O&M) requirements. EPA agrees to the ongoing use of the Arthur Step-back Repository as a CERCLA Corrective Action Management Unit (CAMU), but an O&M plan and its implementation are needed. None of these changes represents a significant departure from the original RODs, but arises from findings and recommendations from the five-year reviews. This ESD also clarifies UDEQ's role in review and acceptance related to soil management plans and support to cities and the county on ICs. This ESD does not alter or change the United States' covenants not to sue in any entered judicial consent decree.

The selected clarifications to the remedies listed in the four RODs, while significant, do not fundamentally change the selected remedies with respect to scope, performance and cost. The remedies still employ source control and require containment of contaminants.

#### 1.5 Administrative Record

We are accepting public comments for a period of 30-days starting on the signature date of this ESD. Please submit comments to:

- Katherine Jenkins  
EPA Region 8 Community Involvement Coordinator  
Phone: (303) 312-6351  
Email: jenkins.katherine@epa.gov

or

- Dave Allison  
UDEQ Community Involvement  
Phone: (801) 536-4479  
Email: dallison@utah.gov

This ESD and supporting documentation will be incorporated into the administrative record as directed in Section 300.825(a)(2) of the NCP. The administrative record is available for public review and comment at the following locations:

- Kennecott South Zone:

**West Jordan City Hall**

8000 S. Redwood Road  
West Jordan, UT 84088  
801-569-5100  
M-F: 8 am – 5 pm

- Both Kennecott zones:

**EPA Region 8 Superfund Records Center**

1595 Wynkoop Street  
Denver, CO 80202-1129

To request copies of administrative record documents call: 303-312-7273 or toll free (Region 8 only) 800-227-8917 ext. 312-7273. Viewing times are M-F: 8:00 am – 5:00 pm; an appointment is required prior to viewing.

**Utah Department of Environmental Quality**

Environmental Response & Remediation Division  
195 North 1950 West  
Salt Lake City, UT 84116

To request copies of administrative record documents call: 801-536-0026, DERR Records Officer. Viewing times are M-F: 8:30 am – 4:30 pm; an appointment is required prior to viewing.

## **2.0 SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY**

### **2.1 Site History**

Mining, milling, smelting and refining activities in the Oquirrh Mountains southwest of Salt Lake City, Utah, began in 1863 and continue to the present day. Historic operations included more than 380 facilities, which in part produced lead, zinc, silver, copper, molybdenum and gold. Various owners have operated these facilities over time. Kennecott Utah Copper, LLC (Kennecott) is the current owner of the Bingham Canyon Mine and its current operations include large open pit copper mining, and associated mining facilities such as the concentrator, smelter, refinery and tailings impoundment. The wastes produced as a result of the historic and current mining activities contain hazardous substances, including heavy metals.

On January 18, 1994, the EPA proposed listing two geographic areas on the NPL encompassing approximately 62 square miles. These areas are referred to as the Kennecott North Zone and the Kennecott South Zone. The EPA created 24 OUs based upon geographic areas, nine within the North Zone and 15 within the South Zone. The September 2002 ROD removed OU21 from the Kennecott North Zone, based on the determination that Kennecott was not the responsible party.

The North Zone, as proposed for listing on the NPL, encompasses the area closest to the Great Salt Lake, including the smelter, refinery, past processing areas, the Magna tailings facilities, wetlands located between these operational areas and the Great Salt Lake, the shoreline of the

Great Salt Lake, and isolated areas of impacted groundwater. The North Zone includes OUs 8, 9, 13, 14, 15, 19, 22, and 23. The North Zone includes ongoing response actions and is subject to five-year reviews. This ESD clarifies the selected remedies at OUs 8, 9, 13, 14, 15, and 19.

The South Zone, as proposed by the EPA for listing on the NPL, encompasses the historic and current mining sites in Bingham Canyon, including the Bingham Mine, and areas impacted by those operations including groundwater contamination. The South Zone Site includes OUs 1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 16, 17, 18, 20, and 24. The South Zone involves ongoing response actions and is subject to five-year reviews. This ESD clarifies the remedies at all South Zone OUs.

To date, the North and South Zones have not been included on the NPL. The EPA agreed not to finalize the listing provided Kennecott perform cleanup activities under the EPA’s oversight. The EPA also agreed to withdraw the Sites from proposal for inclusion on the NPL after Kennecott completed construction of all cleanup projects. In addition, the EPA agreed to consider Kennecott’s operational needs in the scheduling of studies and cleanups. On September 3, 2008, the EPA withdrew the 1994 proposal to list the South Zone Site on the NPL. UDEQ concurred with the withdrawal of the proposed listing of the South Zone Site. The EPA intends to withdraw the 1994 proposal to list the Kennecott North Zone Site on the NPL following entry of a Consent Decree with Kennecott.

## 2.2 Contamination

In the North Zone, many years of smelting and processing ore mined in the central Oquirrh Mountains left behind extensive mine wastes. Contamination can be found in sludge ponds, soils, slag piles, smelter-related waste, and surface water in streams, ditches, ponds and wetlands, as well as groundwater around the active and historic operations near the current and historic communities of Magna, Arthur, and Garfield, Utah.

Arsenic, cadmium, lead, and selenium are the potential contaminants of concern (COCs). These metals have been linked with various types of cancer, high blood pressure, poisoning, gastrointestinal disorders and decreased body weight if people are exposed to them over long periods of time. Birds are particularly sensitive to selenium.

Media Affected	Contaminants	Source of Contamination
Soil, groundwater, surface water, sludge	Arsenic, cadmium, lead, selenium	Wastes from ore smelting and processing, process water and waste management

In the South Zone, beginning in 1863, early miners in the area processed gold, silver, lead, zinc and copper, and erected many mills and smelters. They deposited most wastes in the creeks or on the nearby flood plains and valley slopes. The wastes eroded and were deposited downstream. The primary landmark in the district today is the large, open-pit Bingham Canyon copper mine.

High levels of lead and arsenic were/may be found in soils, sediments, slag, tailings, and waste rock found in the Bingham Creek (OU1) and Butterfield Creek (OU3) drainages, the historic community of Lark, Utah (OU6) and at historic mine waste and mining influenced water management areas around the site. Neighborhoods were built on contaminated flood plains and creek beds in these areas. OU2 includes two groundwater plumes that have two distinct contamination sources and are not connected. The Zone A plume (Appendix A), managed by Kennecott, contains elevated metals, sulfate, low pH, and total dissolved solids in excess of the State of Utah drinking water standards. The Zone B plume (Appendix A), managed by Jordan

Valley Water Conservancy District (as part of a joint project with Kennecott addressing a Natural Resource damage claim filed by Utah), contains elevated levels of sulfate and total dissolved solids in excess of the State of Utah drinking water standards.

Media Affected	Contaminants	Source of Contamination
Soils, groundwater, surface water, sludge, sediment	Arsenic, lead, sulfate and total dissolved solids (TDS)	Waste rock, tailings, tail waters, other mining influenced waters, ore

Please refer to Appendix A for maps of the OUs and a figure depicting Zones A and B of OU2.

## 2.3 Summary of the Selected Remedy from the ROD

### 2.3.1 Bingham Creek ROD

Before the ROD was signed, several cleanup actions were completed under removal authorities and thus eliminated the need to conduct additional cleanup activities. Removal actions in accordance with Action Memoranda dated, May 1991, January 1993, and June 1995, were performed by EPA, Atlantic Richfield Company (ARCO), and Kennecott to address the problems associated with mining waste.

Under multiple Unilateral Administrative Orders, Administrative Orders on Consent, and Memoranda of Understanding, Kennecott performed the removal actions and paid its portion of the costs.

The EPA selected remedies for OUs 1, 4, 5, 10, 11, and 17 within the South Zone in the Bingham Creek ROD dated November 3, 1998. The selected remedy for the Bingham Creek facilities (OUs 1, 4, 5, 10, 11, and 17) ratified the previous removal actions and determined construction was complete. The risks to human health and the environment were eliminated through previous removal actions, land use/building permit controls, and/or the wastes are inaccessible and do not pose a risk to human health or the environment. This decision was based on: (1) at some OUs, the removal actions were designed to achieve final remedial cleanup goals; (2) at one OU, initial studies revealed that the concentrations of contaminants were not high enough to pose a risk to human health; (3) in several locations, the land use was not currently residential or anticipated to be residential and there is little exposure; or (4) at one OU, the waste locations were not accessible to the public or workers. Please refer to the ROD for a full and complete description of the selected remedies.

OU	Name	Selected Remedy
1	Bingham Creek and Flood Plain – Surface Contamination	Ratifies previous removal actions, determines construction complete, and provides for ICs (to be determined)
4	Bingham Reservoirs* <i>*Previously called Large Bingham Reservoir, but there is more than one reservoir.</i>	Ratifies previous removal actions
5	Anaconda/ARCO Tailings	Ratifies previous removal actions, determines construction complete, and provides for ICs (to be determined)
10	Copperton Soils	Ratifies previous removal actions
11	Bingham Canyon Historic Facilities	Ratifies previous removal actions, and determines construction complete based on current and proposed land uses and accessibility
17	Bastian Ditch & Sink	Ratifies previous removal actions, determines construction complete based on current and proposed land uses; and provides for ICs (to be determined)

### 2.3.2 Groundwater ROD

The EPA selected remedies for OUs 2, 12, and 16 within the South Zone in the Groundwater ROD dated December 13, 2000, and subsequent ESDs in June 2003 and June 2007. Please refer to the ROD and subsequent ESDs for a full and complete description of the selected remedies.

OU	Name	Selected Remedy
2	Southwest Jordan Valley Ground Water Plumes	O&M of surface source controls Provides for ICs (to be determined) Point of use management for private well owners Pump and treat acid plume Develop plan to mitigate impact of drawdown from pumping acid plume Installation of barrier wall containment system Groundwater monitoring Disposal of concentrates in tailings impoundment Develop post mine closure plan
12	Water Collection System* <i>*Previously called East Side Collection System, but the system also runs along the South side.</i>	The Facility is managed under Utah's Groundwater Protection Program.
16	Bingham Canyon Underflow* <i>*Previously called Bingham Creek Underflow, but the area includes portions of the canyon, side drainages, alluvial and bedrock aquifers, in addition to the creek.</i>	The Facility is managed under Utah's Groundwater Protection Program.

### 2.3.3 Butterfield ROD

Before the ROD was signed, most of the areas covered by the Butterfield ROD (OUs 3, 6, and 7) were addressed in previous cleanup projects. The previous cleanups were performed by Kennecott and/or EPA using Time-Critical Removal authorities. Wastes containing significant levels of hazardous substances, as well as waste rock with acid generating potential, were removed from the sites. Remaining wastes were covered with clean soil and re-vegetated. EPA determined that the removal actions constituted final remedial construction for these areas.

ICs were also included as EPA's selected remedy in the form of land use restrictions and building protocols, but these are purely local government functions, and at the discretion of the city and county governments. Suggested elements of an IC include a land use plan, site-specific cleanup standards, site redevelopment plan, and building permit requirements. An IC is appropriate should the land use and exposures change. Five-year reviews are needed to evaluate the effectiveness of the ICs.

In some cases, O&M activities were performed by Kennecott using state permitting authorities (groundwater permit, National Pollutant Discharge Elimination System (NPDES) permit, Utah Division of Oil, Gas and Mining (DOG M) mine operating permit, etc.) In other cases, long term management was to be provided by local (city or county) zoning ordinances and building permit requirements.

The EPA selected remedies for OUs 3, 6 and 7 within the South Zone in the Butterfield ROD dated September 28, 2001. Please refer to the ROD for a full and complete description of the selected remedies.

OU	Name	Selected Remedy
3	Butterfield Mine, Butterfield Canyon & Herriman	Ratifies previous removal actions; and provides for ICs (to be determined based on current and proposed land use)
6	Lark Tailings & Waste Rock	Ratifies previous removal actions
7	South Jordan Evaporation Ponds	Cap sludge and conduct O&M; ratifies previous removal and remedial actions

#### 2.3.4 Kennecott North Zone and South Zone ROD

The overall site cleanup strategy was to address surface materials which posed a current threat to industrial workers and wildlife through removal actions, followed by addressing long term threats by treatment of groundwater, cleanup of currently inaccessible mining wastes following facility closure, and mapping of buried wastes for use by future land use planners and developers.

The principal threats were addressed by a seven-year long Non-Time Critical Removal Action which removed and/or capped wastes which were contributing to groundwater contamination. Because the remedies will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use/unrestricted exposure (UU/UE), five-year reviews are required to ensure that the remedies are, or will be, protective of human health and the environment.

The EPA selected remedies for OUs 8, 9, 13, 14, 15, 19, 22, and 23 within the North Zone and OUs 18, 20 and 24 within the South Zone in the Kennecott North Zone and South Zone ROD dated September 26, 2002. Please refer to the ROD for a full and complete description of the selected remedies.

OU	Name	Selected Remedy
8	Waste Water Treatment Plant & Sludge Ponds	Requirements under OU23 involving monitoring effectiveness of groundwater source control measures Provide maps to Salt Lake County (or any annexing municipality) showing locations of buried wastes above the EPA's action levels for industrial land use and for unrestricted land use
9	Magna Soils	Ratifies previous removal actions
13	Smelter & Acid Plants	Following demolition of closed milling facilities, lands underneath must be characterized and contaminated soils removed to Arthur Step-back Repository As-generated RCRA wastes must be recycled or removed to approved off-site facility After removal of contaminated soils, site will be capped with at least 18" of clean fill if unexcavated wastes remain, re-graded and re-vegetated Three maps will be produced Remedial action may be required at the site of the former Acid Tank Farm currently being addressed through a RCRA corrective action plan
14	Refinery	Following demolition of closed milling facilities, lands underneath must be characterized and contaminated soils removed to Arthur Step-back Repository As-generated RCRA wastes must be recycled or removed to approved off-site facility After removal of contaminated soils, site will be capped with at least 18" of clean fill if unexcavated wastes remain, re-graded and re-vegetated Three maps will be produced Upon mine closure, soils will be characterized and the determination for additional removal actions or applicability of ICs will be made based on the current and anticipated future land use.

OU	Name	Selected Remedy
15	Magna Mills & Tailing Ponds	Following demolition of closed milling facilities, lands underneath must be characterized and contaminated soils removed to Arthur Step-back Repository; site will be re-vegetated Three maps will be produced
18	Mine Drainage – Tooele County* <i>*Previously called Acid Mine Drainage, but there is no acidic drainage and contains mine tunnels, adits, overburden dumps, and water discharge.</i>	Water Supply Tunnel Dump (Utah Metals Tunnel in Middle Canyon) must be inspected on an biennial basis to determine if actions taken there are effective A map for local authorities must be produced which shows locations where contaminants are too high to allow unrestricted land use in the future
19	Smelter Fallout	Mapping of areas where COC concentrations exceed developed land use standards or pose an increased risk of observable effects to either ecological or human receptors Plant species which can concentrate the COCs will not be used during re-vegetation Areas that have a potential to pose a threat dependent upon future land use will be segregated and scheduled for appropriate remedial and reclamation activities in the future, pursuant to the chosen land use If canyon areas are mined for sand, gravel, or topsoil, none of these materials containing lead greater than 500 ppm and/or arsenic greater than 50 ppm shall leave the site
20	Pine Canyon	Provide maps of waste left in place
24	Precipitation Plant	Precipitation Plant: <ul style="list-style-type: none"> <li>• Demolish unneeded buildings and infrastructure, and decontaminate construction debris as needed prior to disposal</li> <li>• Fully characterize the site; provide maps indicating where buried and surface wastes are located</li> <li>• At a minimum, remove contaminated materials down to a depth of 18" and dispose in an appropriate repository or landfill</li> <li>• Cap any remaining wastes and re-vegetate</li> <li>• Provide run-off and run-on controls</li> <li>• ICs may be necessary</li> </ul> Bingham and Garfield (B&G) Railroad Corridor: <ul style="list-style-type: none"> <li>• Determine the location of the historic rail bed between Bingham Canyon and Magna</li> <li>• Characterize the rail bed soils and any other impacted media</li> <li>• Remove the soils with concentrations of COCs above the standards for the intended land use</li> <li>• Any capped-in-place waste must be mapped</li> </ul> Operating Railroads on Kennecott Property: <ul style="list-style-type: none"> <li>• Remove site infrastructure pursuant to chosen land use</li> <li>• Characterize to determine extent of impact from ore and other material shipment options</li> <li>• Remove the soils with concentrations of COCs above the standards for the intended land use</li> <li>• Any capped-in-place waste must be mapped</li> </ul>
25	Kennecott Historic Sites	Section 12 of the North and South Zone ROD, Table 12.3, lists over 300 historic facilities. These facilities are included within other geographic operable units and subject to remedy decisions selected in one of the four RODs issued for the sites. The duplicative reference to the historic facilities listed in Table 12.3 has created confusion. For clarity and ease of reference, OU 25 was designated to refer to these historic facilities.

### **3.0 BASIS FOR THE ESD**

It is well known that mining waste has washed all the way from the Bingham Canyon to the Jordan River, approximately 12 miles. Before the RODs were signed, numerous cleanup actions were completed under removal authorities and thus eliminated the need to conduct additional cleanup. A seven-year long Non-Time Critical Removal Action occurred in accordance with Action Memoranda dated May 1991, January 1993, and June 1995. The removal work was performed by EPA, ARCO, and Kennecott to address the problems associated with mining waste.

Not all of the removal actions cleaned the areas to unlimited use and unrestricted exposure (UU/UE). At the time of the RODs, the land use and zoning designation allowed waste to be left in place. Furthermore, there were no future plans to develop the site for other purposes. Five-year reviews were completed for the Kennecott North Zone in June 2014 and for the Kennecott South Zone in 2009, 2010, and 2016. These five-year reviews identified various issues and recommendations to ensure protectiveness in both the short and long term. Most of the issues and recommendations were related to either O&M or ICs.

The cities of Herriman, South Jordan and West Jordan have agreed to oversee future land use changes using local authorities for land use planning, zoning and building permits. However, local ordinances have only been implemented for the cities of Herriman and West Jordan. EPA and UDEQ worked closely with these local jurisdictions to develop IC programs to address future land use changes where waste is left in place. The objectives of the ICs are to reduce or control human exposure to contaminants of concern. This ESD clarifies that local ordinances, environmental covenants, and/or restrictive notices and related soil management plans will be implemented with review and acceptance by UDEQ.

In 2013, Salt Lake County adopted an IC (Chapter 9.50 of the municipal code) to limit human exposure to waste left in place for unincorporated county lands. This IC requires applicants seeking a building permit, subdivision approval, or excavation permits from the County to confirm that soils comply with applicable land use action levels. Under the IC, if the applicant is unable to confirm applicable land use action levels are attained on the property, they are referred to the UDEQ for further assessment. Upon approval of submitted maps by Kennecott and development of soil management plans, EPA and UDEQ will provide the local jurisdictions with approved maps and soil management plans for each OU where soils exceed UU/UE.

To aid the local jurisdictions in implementing the IC, EPA and UDEQ have drafted OU-specific soil management plans and are seeking comments from Salt Lake County. These drafts includes provisions for those who wish to develop or disturb the soil in areas exceeding UU/UE. Applicants must obtain a permit from either Salt Lake County's Planning and Development Services Department, Flood Control Department, or Engineering Division. Applicants must demonstrate that the soils on the property meet the applicable land use action levels for the proposed use or development. Please see Appendix B, Technical Memorandum dated December 29, 2015 for a table of applicable land use action levels.

Under the draft OU-specific soil management plans, if the soils exceed the applicable land use action level for the proposed use or development, applicants must submit a sampling and analysis plan for the parcel's characterization. Upon review and acceptance by UDEQ, the applicant must submit a characterization report, a work plan and a post response action report

demonstrating appropriate management of the soil. This soil management plan will ensure changing land use will comply with the applicable land use action levels.

A groundwater IC is already in place for Salt Lake County which is implemented by the Utah State Engineer’s Office, and requires an evaluation of any drilling of groundwater wells into the contaminated groundwater plumes. The remedy involves the use of existing water treatment facilities that are also used for active mining operations. This ESD clarifies that upon transition from active mining to mine closure and the demolition of the existing water treatment facilities, additional ICs may be needed to address waste left in place.

In addition to requiring ICs, this ESD clarifies the importance of accurate and updated maps. In order to properly manage the OUs, and ICs, maps are needed to make decisions and respond to inquiries. These maps should depict the current land use in order to determine the appropriate ICs. The OU boundary maps were submitted to EPA in December 2015. This ESD clarifies that the maps are required as part of the remedies and should be updated at least every five years, to support the five-year review process, and be based on the most recent data available. Maps of where waste is left in place are being developed and will be provided to Salt Lake County to assist with implementing the ICs.

Finally, this ESD clarifies the O&M requirements at all of the OUs. For the OUs on Kennecott property, a site-wide management plan for waste left in place (WLIP) and future encountered waste (FEW) are required. These management plans need to be approved by the EPA and UDEQ. These plans will provide procedures for further site evaluation and soil response action in light of a change in land use in the future. Kennecott has provided EPA and UDEQ with draft management plans for Kennecott-owned property, which are under review. Salt Lake County and the municipalities will be implementing their respective ordinances on property that is not owned by Kennecott, including former Kennecott property.

**4.0 DESCRIPTION OF DIFFERENCES BETWEEN THE ROD REMEDY AND THE CLARIFIED REMEDY**

This section presents an overall summary of the clarifications selected for the remedies listed in the four RODs. The clarifications identified in this ESD are administrative and do not require additional construction. Section 4.1 (Remedy Scope) provides a summary of the clarifications for each OU. Sections 4.2 (Performance) and 4.3 (Cost) discuss any potential concern from the selected clarifications.

**4.1 Remedy Scope**

The following tables identify the modified remedies for each OU and assume that local jurisdictions and UDEQ will oversee the implementation of soil management plans for property not owned by Kennecott:

*4.1.1 Bingham Creek ROD, dated November 3, 1998*

OU	Name	Modified Remedy
1	Bingham Creek and Flood Plain – Surface Contamination	Update maps every five years at a minimum. Implement management plans for Waste Left in Place (WLIP) and Future Encountered Waste (FEW) for Kennecott-owned property subject to approval (WLIP plan will list procedures for maintaining covers).
4	Bingham Reservoirs* *Previously called Large Bingham	Update maps every five years at a minimum. Implement WLIP and FEW plans for Kennecott-owned property subject to

OU	Name	Modified Remedy
	<i>Reservoir, but there is more than one reservoir.</i>	approval. This OU is also managed under Utah's Groundwater Protection Program.
5	Anaconda/ARCO Tailings, Including the Bastian Ditch	Update maps every five years at a minimum. An O&M plan for covers and caps is subject to approval.
10	Copperton Soils	Update maps every five years at a minimum. Implement FEW plan for Kennecott-owned property is subject to approval.
11	Bingham Canyon Historic Facilities	Update maps every five years at a minimum. Implement FEW plan for Kennecott-owned property subject to approval.
17	Bastian Sink	Update maps every five years at a minimum. Implement the O&M plan that was approved in December 2006 which manages FEW.

4.1.2 *Groundwater ROD, dated December 13, 2000, and subsequent ESDs in June 2003 and June 2007*

OU	Name	Modified Remedy
2	Southwest Jordan Valley Ground Water Plumes	Update maps every five years at a minimum.
12	Water Collection System* <i>*Previously called East Side Collection System, but the system also runs along the South side.</i>	Update maps every five years at a minimum. Implement FEW plan for soil management during facility relocation for Kennecott-owned property subject to approval.
16	Bingham Canyon Underflow* <i>*Previously called Bingham Creek Underflow, but the area includes portions of the canyon, side drainages, alluvial and bedrock aquifers, in addition to the creek.</i>	Update maps every five years at a minimum. Implement FEW plan for soil management during facility relocation for Kennecott-owned property subject to approval.

4.1.3 *Butterfield ROD, dated September 28, 2001*

OU	Name	Modified Remedy
3	Butterfield Mine, Butterfield Canyon & Herriman	Update maps every five years at a minimum. Implement WLIP and FEW plans for Kennecott-owned property subject to approval (WLIP plan will list procedures for maintaining covers).
6	Lark Tailings & Waste Rock	Update maps every five years at a minimum. Implement WLIP and FEW plans for Kennecott-owned property subject to approval (WLIP plan will list procedures for maintaining covers).
7	South Jordan Evaporation Ponds	Update maps every five years at a minimum. Implement the O&M plan that was approved in December 2006 which manages FEW.

4.1.4 *Kennecott North Zone and South Zone ROD, dated September 26, 2002*

OU	Name	Modified Remedy
8	Waste Water Treatment Plant & Sludge Ponds	Implement WLIP and FEW plans for Kennecott-owned property subject to approval (WLIP plan will list procedures for maintaining covers).

<b>OU</b>	<b>Name</b>	<b>Modified Remedy</b>
13	Smelter & Acid Plants	Implement WLIP and FEW plans for Kennecott-owned property subject to approval (WLIP plan will list procedures for maintaining covers).
14	Refinery	Implement WLIP and FEW plans for Kennecott-owned property subject to approval (WLIP plan will list procedures for maintaining covers and caps).
15	Magna Mills & Tailing Ponds	Implement WLIP and FEW plans for Kennecott-owned property subject to approval (WLIP plan will list procedures for maintaining covers). Continued use and possible expansion of the Arthur Step-back Repository as a CERCLA CAMU is acceptable. An O&M & Replacement plan for the facility has been submitted for approval and will be implemented.
18	Mine Drainage – Tooele County* <i>*Previously called Acid Mine Drainage, but there is no acidic drainage and contains mine tunnels, adits, overburden dumps, and water discharge.</i>	Implement WLIP and FEW plans for Kennecott-owned property subject to approval (WLIP plan will list procedures for maintaining covers).
19	Smelter Fallout	Implement WLIP and FEW plans for Kennecott-owned property subject to approval (WLIP plan will restrict the intentional introduction of plants capable of up-taking selenium).
20	Pine Canyon	Implement WLIP and FEW plans for Kennecott-owned property subject to approval (WLIP plan will restrict the intentional introduction of plants capable of up-taking selenium).
24	Precipitation Plant, Historic and Operational Rail facilities, Copperton Concentrator and Process Water Reservoirs, Tunnel 5490, 6040, and Unnamed Adit.	Implement WLIP and FEW plans for Kennecott-owned property subject to approval (WLIP plan will list procedures for maintaining covers).
*25	Kennecott Historic Sites* <i>*This OU was defined in a technical memorandum dated 2/5/2016 and simply captures the sites and remedies listed in Table 12.3 of the ROD.</i>	Update maps every five years at a minimum. Implement WLIP and FEW plans for Kennecott-owned property subject to approval (WLIP plan will list procedures for maintaining covers).

## 4.2 Performance

There are no key differences in performance between the original selected remedies and the listed clarifications. All of the clarifications address O&M and/or ICs. These are administrative changes and do not impact performance.

## 4.3 Cost

The key differences in capital and O&M costs between the original selected remedies and the listed clarifications are minimal. All of the clarifications address O&M or ICs. These are administrative changes and do not increase remedial costs.

## 5.0 SUPPORT AGENCY COMMENTS

The UDEQ has provided comments on this ESD and has participated in Region 8’s ESD review meeting. The incorporation of UDEQ’s comments is documented in the administrative record. UDEQ agrees with the modified remedies as described in this ESD.

## 6.0 STATUTORY DETERMINATIONS

In accordance with CERCLA section 121, 42 U.S.C. § 9621, the EPA has determined that this action is protective of human health and the environment, complies with federal and state applicable or relevant and appropriate requirements (ARARs) to the remedial action, are cost-effective, and utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. The ARARs have been analyzed separately. In accordance with NCP Section 300.430(a)(iii), the remedy meets the expectations to utilize containment of large volumes of low level threat waste.

## 7.0 PUBLIC PARTICIPATION REQUIREMENTS

In accordance with requirements of CERCLA section 117 and NCP section 300.435(c)(2)(i), the EPA is issuing this ESD as the clarifications to four RODs, while significant, do not fundamentally alter the original remedy selected in the ROD with respect to scope, performance, or cost. We are accepting public comments for a period of 30-days starting on the signature date of this ESD. Please refer to Section 1.5 Administrative Record on how to submit comments. This ESD and the supporting information shall be available to the public at the information repository located at:

- Kennecott South Zone

**West Jordan City Hall**

8000 S. Redwood Road  
West Jordan, UT 84088  
801-569-5100  
M-F: 8 am – 5 pm

- Both Kennecott zones

**EPA Region 8 Superfund Records Center**

1595 Wynkoop Street  
Denver, CO 80202-1129

To request copies of administrative record documents call: 303-312-7273 or toll free (Region 8 only) 800-227-8917 ext. 312-7273. Viewing times are M-F: 8:00 am – 5:00 pm; an appointment is required prior to viewing.

**Utah Department of Environmental Quality**

Environmental Response & Remediation Division  
195 North 1950 West  
Salt Lake City, UT 84116

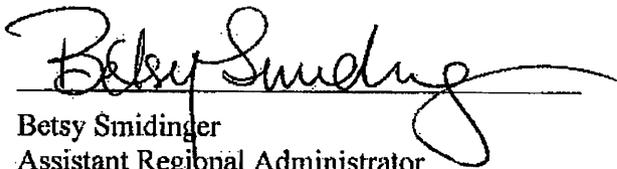
To request copies of administrative record documents call: 801-536-0026, DERR Records Officer. Viewing times are M-F: 8:30 am – 4:30 pm; an appointment is required prior to viewing.

## 8.0 AUTHORIZING SIGNATURES

### Federal

This ESD documents clarifications to the remedies previously selected by the United States Environmental Protection Agency for the Kennecott North Zone (UTD070926811) and the Kennecott South Zone (UTD000826404) Records of Decision.

The following authorized official at EPA Region 8 approves the modified remedies as described in this ESD.



Betsy Smidinger  
Assistant Regional Administrator  
Office of Ecosystems Protection  
and Remediation

August 11, 2017  
Date

### State of Utah

This ESD documents clarifications to the remedies previously selected by the United States Environmental Protection Agency for the Kennecott North Zone (UTD070926811) and the Kennecott South Zone (UTD000826404) Records of Decision.

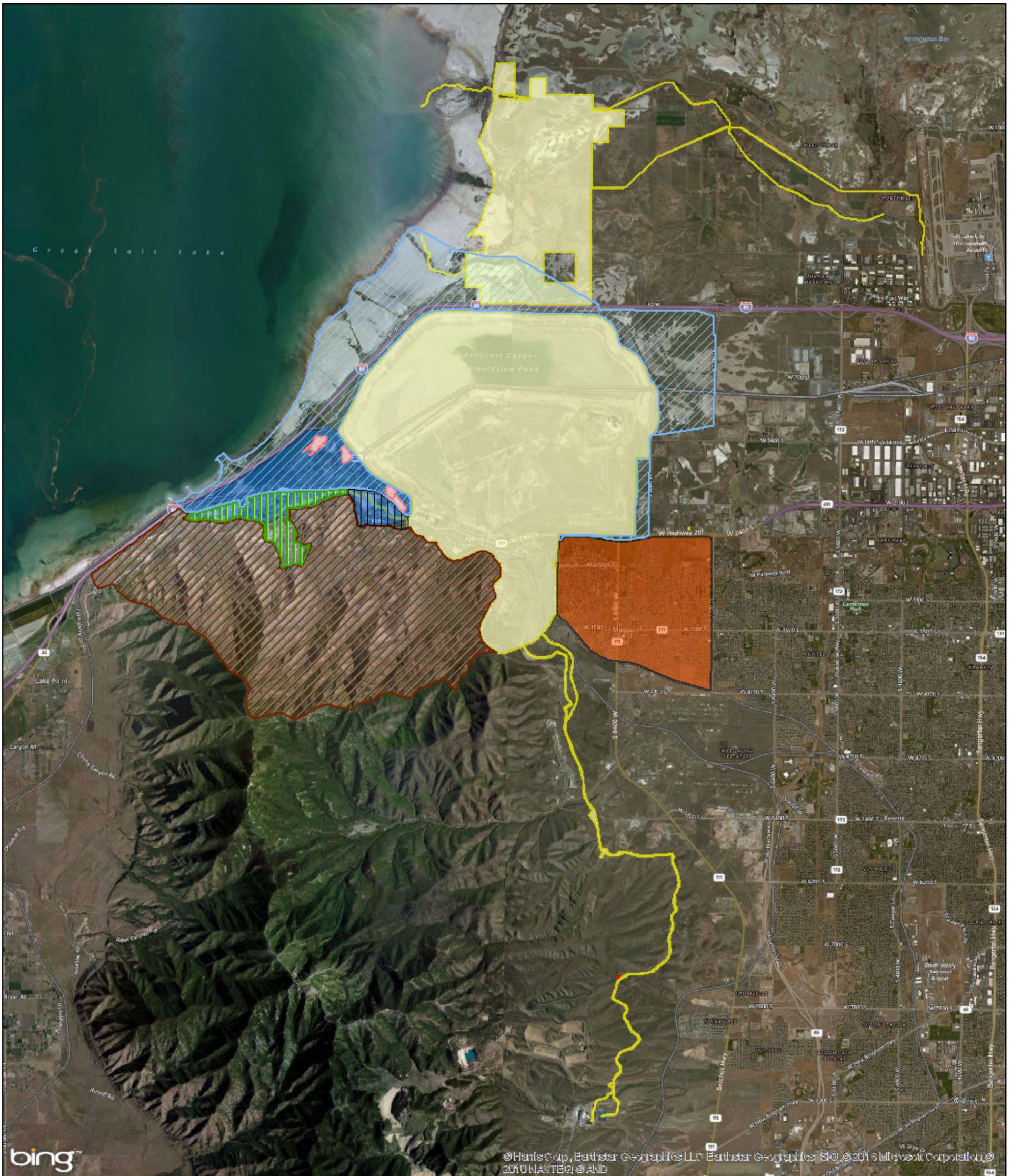
The following authorized official at the Utah Department of Environmental Quality approves the modified remedies as described in this ESD.



Alan Matheson  
Executive Director  
Utah Department of Environmental Quality

August 11, 2017  
Date

**Appendix A**  
**Maps**



## Kennecott North Zone/Tailings Operable Units

- |  |   |
|--|---|
|  <b>OU 8</b> Waste Water Treatment Plant and Sludge Ponds |  <b>OU 15</b> Mills and Tailings Pond  |
|  <b>OU 9</b> Magna Soils                                  |  <b>OU 19</b> Smelter Fallout          |
|  <b>OU 13</b> Smelter and Acid Plants                     |  <b>OU 22</b> Great Salt Lake Wetlands |
|  <b>OU 14</b> Refinery                                    |  <b>OU 23</b> North End Groundwater    |

Map Date: July 28, 2016

Map Projection: UTM, Meters, 12 North, NAD83

Data Sources: Boundaries - U.S. EPA Region 8 (2016)  
Imagery - Microsoft Bing web service (2016)

\*Boundaries are based on the nature and extent of contamination and are subject to change.

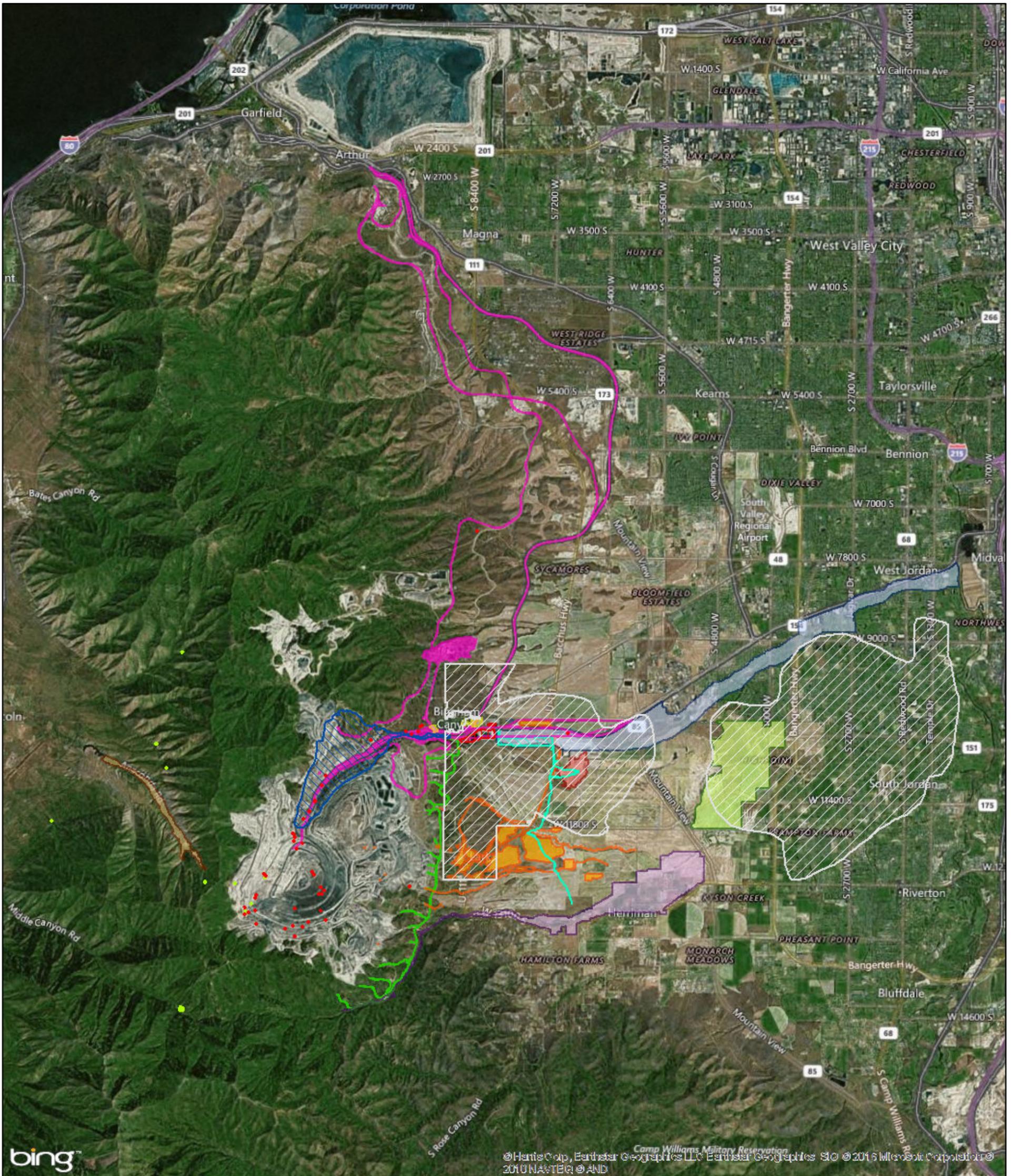


0 2.5 5 Miles



Copyright © 2013 National Geographic Society, i-cubed

Utah



## Kennecott South Zone/Bingham Operable Units

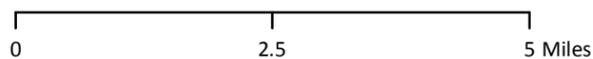
-  **OU 1** Bingham Creek
-  **OU 2** Southwest Jordan River Valley Ground Water Plumes
-  **OU 3** Butterfield Canyon and Herriman
-  **OU 4** Bingham Reservoirs
-  **OU 5** Arco Tailings
-  **OU 6** Lark Waste Rock and Tailings
-  **OU 7** South Jordan Evaporation Ponds
-  **OU 10** Copperton Soils
-  **OU 11** Kennecott Historic Sites
-  **OU 12** Water Collection System
-  **OU 16** Bingham Canyon Underflow
-  **OU 17** Bastian Sink
-  **OU 18** Mine Drainage Tooele County
-  **OU 20** Pine Canyon
-  **OU 24** Precipitation Plant

Map Date: July 28, 2016

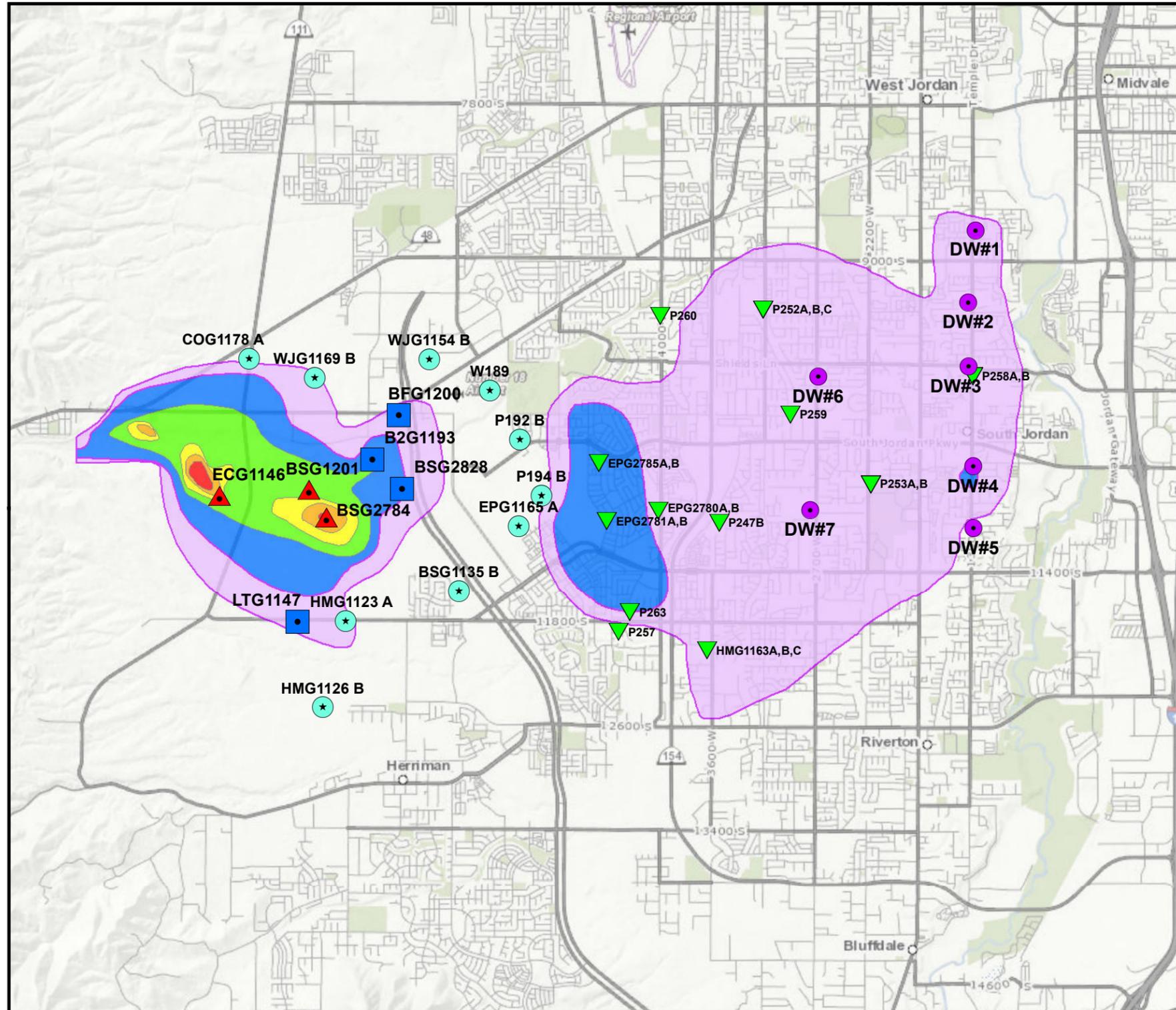
Map Projection: UTM, Meters, 12 North, NAD83

Data Sources: Boundaries - U.S. EPA Region 8 (2016)  
Imagery - Microsoft Bing web service (2016)

\*Boundaries are based on the nature and extent of contamination and are subject to change.



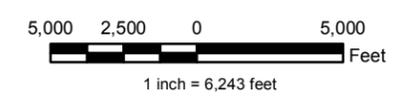
Utah



**2013 Sulfate Concentrations**

- 20,000+ mg/L
- 15,000 - 19,999 mg/L
- 10,000 - 14,999 mg/L
- 5,000 - 9,999 mg/L
- 1,500 - 4,999 mg/L
- 500 - 1,499 mg/L

- ▲ Acid Extraction Well
- Barrier Extraction Well
- JWCD Extraction Wells
- ★ Compliance Well
- ▼ Kennecott Monitoring Well



Designed By: JI	<b>KENNECOTT UTAH COPPER</b>		ZONE A & B 2013 SULFATE CONCENTRATIONS
Drawn by: EA	ENVIRONMENTAL		
Project Eng: IS	Dwg No.: ZONE A & B		
Project Manager: BV	Project: 2013 ANNUAL GW REPORT		

**Appendix B**  
**Technical Memorandum**  
**Compilation of soil and groundwater action levels**  
**December 29, 2015**



State of Utah

GARY R. HERBERT  
*Governor*

SPENCER J. COX  
*Lieutenant Governor*

Department of  
Environmental Quality

Alan Matheson  
*Executive Director*

DIVISION OF ENVIRONMENTAL  
RESPONSE AND REMEDIATION

Brent H. Everett  
*Director*

**TECHNICAL MEMORANDUM**

**SUBJECT:** Compilation of soil and groundwater action levels

**FROM:** Douglas Bacon, UT DEQ-DERR *DCB*  
Kerri Fiedler, U.S. EPA Region 8 *KF*

**TO:** Kennecott North and South Zones Administrative File

**DATE:** December 29, 2015

Since 1998, four records of decision (RODs) have been issued for the Kennecott North and South Zone operable units (OUs). Under each of these RODs various land use action levels for metals in soils were selected. Similarly, various action levels for groundwater contaminants were established under the RODs or by the State of Utah's Groundwater Protection Program (GWPP). This technical memorandum compiles all the action levels into a single document and clarifies inconsistencies determined during recent five-year reviews.

The UT DEQ-DERR and the EPA Region 8 (Agencies) have compiled the soil action levels for OUs 1, 3-15, 17-20, 22, and 24 (Attachment 1). Listed action levels are obtained from existing risk assessment and risk management documents which are part of the administrative record. There are footnotes at the end of the soil action levels table which explain the applicability of the action levels and define the action which can be performed to address an exceedance. Numbered notes on the table provide reference where each of the listed action levels are obtained.

The Agencies have compiled the groundwater action levels for OUs 2, 12, 16, and 23 (Attachment 2). Listed action levels are obtained from existing human health and ecological risk assessment and risk management documents which are part of the administrative record. The listed action levels also take into account the Agencies' selected remedy to rely on the permitting restrictions of the State of Utah's GWPP, overseen by the UT DEQ - Division of Water Quality (UT DEQ-DWQ) for OUs 12 and 16. Remedial actions being implemented at OUs 12 and 16 are being overseen by UT DEQ-DWQ under the permit program to ensure that OU2 is not further impacted.

It is the intent of the Agencies that this technical memorandum will be used as reference under various site-wide and OU-specific management plans, to ensure the mining impacted soils and groundwater are effectively managed until such time that unrestricted use/unlimited exposure action levels are attained. The action levels listed in the two attachments are amendable by the Agencies premised on further risk assessment and risk management decisions, or recommendations by UT DEQ-DWQ.

**Attachment 1**  
**Table of Soil Action Levels**  
**for Kennecott North and South Zones**

**Site Wide Summary of Soil Action Levels for Kennecott North and South Zones**  
(units are mg/kg, parts per million, except where otherwise noted)

Land Use, Media or Receptor	As	Cd	Cr	Cu	Mo	Pb	Se	Zn
<b>OU1 Bingham Creek (SOUTH ZONE)</b>								
Industrial <sup>1</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Commercial <sup>2</sup>	-	-	-	-	-	2000	-	-
Agricultural <sup>1</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>1</sup>	283	758	114	25.2%	34067	2207	34067	100%
Residential <sup>2</sup>	100	-	-	-	-	1100	-	-
Discrete Bingham Creek Channel Parcels (Daybreak Community) - Residential <sup>8</sup>	100	-	-	-	-	700	-	-
Discrete Bingham Creek Channel Parcels (Daybreak Community) - Commercial <sup>8</sup>	450	-	-	-	-	2000	-	-
Discrete Daybreak Commerce Park Parcels <sup>8</sup>	450	-	-	-	-	2000	-	-
<b>OU2 South End Groundwater (SOUTH ZONE)</b>								
Groundwater	See Groundwater Action Levels Table							
<b>OU3 Butterfield Waste Rock (SOUTH ZONE)</b>								
Industrial <sup>1</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural <sup>1</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>1</sup>	283	758	114	25.2%	34067	2207	34067	100%
Residential, Day Care and Playgrounds <sup>3</sup>	100	-	-	-	-	1200	-	-
<b>OU3 Butterfield Canyon Creek (SOUTH ZONE)</b>								
Industrial <sup>1</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural <sup>1</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>1</sup>	283	758	114	25.2%	34067	2207	34067	100%
Residential, Day Care and Playgrounds <sup>3</sup>	100	-	-	-	-	1200	-	-
<b>OU3 Herriman Residential and Agricultural (SOUTH ZONE)</b>								
Industrial <sup>5</sup>	850	2794	8381	10.3%	13972	4000	13972	83%
Agricultural <sup>5</sup>	300	2148	6444	79689	10740	10,000	10740	64%
Recreational <sup>5</sup>	300	758	114	25.2%	34067	10,000	34067	100%
Residential, Day Care and Playgrounds <sup>3</sup>	100	-	-	-	-	1200	-	-
<b>OU4 Large Bingham Reservoir (SOUTH ZONE)</b>								
Industrial <sup>1</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural <sup>1</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>1</sup>	283	758	114	25.2%	34067	2207	34067	100%
<b>OU5 Anaconda Tailings (SOUTH ZONE)</b>								
Industrial <sup>1</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural <sup>1</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>1</sup>	283	758	114	25.2%	34067	2207	34067	100%
<b>OU5 Bastian Ditch (SOUTH ZONE)</b>								
Industrial <sup>1</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural <sup>1</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>1</sup>	283	758	114	25.2%	34067	2207	34067	100%
<b>OU5 Bastian Ditch Daybreak Area (SOUTH ZONE)</b>								
Industrial <sup>1</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural <sup>1</sup>	100	2148	6444	79689	10740	8500	10740	64%

**Site Wide Summary of Soil Action Levels for Kennecott North and South Zones  
(units are mg/kg, parts per million, except where otherwise noted)**

Land Use, Media or Receptor	As	Cd	Cr	Cu	Mo	Pb	Se	Zn
Commercial <sup>4</sup>	450	-	-	-	-	2000	-	-
Recreational <sup>1</sup>	283	758	114	25.2%	34067	2207	34067	100%
Residential <sup>4</sup>	100	-	-	-	-	700	-	-
<b>OU6 Lark Waste Rock and Tailings (SOUTH ZONE)</b>								
Industrial <sup>1</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural <sup>1</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>1</sup>	283	758	114	25.2%	34067	2207	34067	100%
<b>OU7 South Jordan Evaporation Ponds (SOUTH ZONE)</b>								
Industrial <sup>1</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Commercial <sup>4</sup>	450	-	-	-	-	2000	-	-
Agricultural <sup>1</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>1</sup>	283	758	114	25.2%	34067	2207	34067	100%
Residential <sup>4</sup>	100	-	-	-	-	700	-	-
<b>OU8 Waste Water Treatment Plan and Sludge Ponds (NORTH ZONE)</b>								
Industrial <sup>6</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural <sup>6</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>6</sup>	283	758	114	25.2%	34067	2207	34067	100%
<b>OU9 Magna Soils (NORTH ZONE)</b>								
Industrial <sup>6</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural <sup>6</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>6</sup>	283	758	114	25.2%	34067	2207	34067	100%
<b>OU10 Copperton Soils (SOUTH ZONE)</b>								
Industrial <sup>1</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural <sup>1</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>1</sup>	283	758	114	25.2%	34067	2207	34067	100%
<b>OU11 Historic Facilities (SOUTH ZONE)</b>								
Industrial <sup>7</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural <sup>7</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>7</sup>	283	758	114	25.2%	34067	2207	34067	100%
<b>OU12 Eastside Collection System (SOUTH ZONE)</b>								
Industrial <sup>1</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural <sup>1</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>1</sup>	283	758	114	25.2%	34067	2207	34067	100%
Groundwater	See Groundwater Action Levels Table							
<b>OU13 Smelter and Acid Plant (NORTH ZONE)</b>								
Industrial <sup>6</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural <sup>6</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>6</sup>	283	758	114	25.2%	34067	2207	34067	100%
<b>OU14 Refinery (NORTH ZONE)</b>								
Industrial <sup>6</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural <sup>6</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>6</sup>	283	758	114	25.2%	34067	2207	34067	100%

**Site Wide Summary of Soil Action Levels for Kennecott North and South Zones**  
(units are mg/kg, parts per million, except where otherwise noted)

Land Use, Media or Receptor	As	Cd	Cr	Cu	Mo	Pb	Se	Zn
<b>OU15 Magna Mills and Tailings Ponds (NORTH ZONE)</b>								
Industrial <sup>6</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural <sup>6</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>6</sup>	283	758	114	25.2%	34067	2207	34067	100%
<b>OU16 Bingham Creek Underflow (SOUTH ZONE)</b>								
Groundwater	See Groundwater Action Levels Table							
<b>OU17 Bastian Sink (SOUTH ZONE)</b>								
Industrial <sup>1</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Commercial <sup>4</sup>	450	-	-	-	-	2000	-	-
Agricultural <sup>1</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>1</sup>	283	758	114	25.2%	34067	2207	34067	100%
Residential <sup>4</sup>	100	-	-	-	-	700	-	-
<b>OU18 Acid Mine Drainage (Tooele County Areas) (SOUTH ZONE)</b>								
Industrial <sup>1</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural <sup>1</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>1</sup>	283	758	114	25.2%	34067	2207	34067	100%
<b>OU19 Smelter Fallout (NORTH ZONE)</b>								
Industrial <sup>6</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural <sup>6</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>6</sup>	283	758	114	25.2%	34067	2207	34067	100%
<b>OU20 Pine Canyon (SOUTH ZONE)</b>								
Industrial <sup>6</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural <sup>6</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>6</sup>	283	758	114	25.2%	34067	2207	34067	100%
<b>OU22 Great Salt Lake and Wetlands (NORTH ZONE)</b>								
Industrial <sup>6</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural <sup>6</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>6</sup>	283	758	114	25.2%	34067	2207	34067	100%
<b>OU23 North Zone Groundwater (NORTH ZONE)</b>								
Groundwater	See Groundwater Action Levels Table							
<b>OU24 Precipitation Plant (SOUTH ZONE)</b>								
Industrial <sup>6</sup>	261	2794	8381	10.3%	13972	4414	13972	83%
Agricultural <sup>6</sup>	100	2148	6444	79689	10740	8500	10740	64%
Recreational <sup>6</sup>	283	758	114	25.2%	34067	2207	34067	100%

**Notes for Site Wide Summary of Soil Action Levels for Kennecott North and South Zones**

<sup>†</sup> The table provides a listing of the action levels for various metals of concern which can be found in soils located in the operable units of the Kennecott South and North Zones. The table provides concentration levels (or percentage values) to compare against soil characterization results. If a particular land use action level is exceeded, then, prior to redevelopment a person will have to undertake action to assess and/or mitigate the potential for exposure risk.

The term "action" may include but is not limited to: further site characterization, further site specific risk assessment, remedial/response action to mitigate exposure risk, implementation of institutional controls (ICs), and/or ongoing site management after development activities.

<sup>††</sup> The soil action levels listed in this table can only be used when comparing metals concentrations in soils/sediments collected from the operable units of the Kennecott South and North Zone. As part of assessing the potential exposure risk caused by the listed metals

**Notes for Site Wide Summary of Soil Action Levels for Kennecott North and South Zones**

of concern, certain variables specific to the Kennecott operable units were considered. These variables include, but are not limited to, the following: speciation and bioavailability of the metals of concern, the industrial processes that produced the specific mine waste with the metals of concern, and the types of specific land use activities that are likely to take place in each operable unit.

*The listed action levels presented herein do not apply to other sites within the State of Utah located beyond the boundaries of the Kennecott operable units (except as otherwise explained below as it pertains to the site wide unrestricted land use action levels).*

††† Default site wide (Kennecott South or North Zone) unrestricted land use action levels for arsenic (50 mg/kg), cadmium (70 mg/kg), lead (500 mg/kg), and selenium (390 mg/kg) have been derived for those portions of the site where a site specific, risk based, residential action level has not been established and for locations not modeled during the site specific risk assessments. Using default numbers for exposure parameters, conservative values for bioavailability and intake ratios under standard risk assessment and management methodology, the Agencies calculated the default unrestricted land use action levels. The unrestricted land use action levels are protective of public health for all land uses without restrictions, including relocation beyond the Kennecott boundaries. It is important to note, that while the arsenic, cadmium, lead, and selenium unrestricted land use action levels may be protective for a residential land use, they may not be protective of other exposure scenarios (e.g., ecological risk).

Both the arsenic and lead unrestricted land use action levels are based on risk assessment and risk management methods. Due to possibility of contaminated media associated with mining and smelting operations and the uncertainty associated with the limited environmental information (i.e., bioavailability) these unrestricted land use action levels should be used when limited characterization data is available and potential off-site (meaning beyond the Kennecott boundaries) relocation is being considered. The arsenic and lead unrestricted land use action levels are derived from the September 2002 Record of Decision.

The cadmium and selenium unrestricted land use action levels have been calculated by using a residential exposure scenario based on the "Risk Assessment Guidance for Superfund (RAGS) part B" (<http://www.epa.gov/swerrims/riskassessment/ragsb/index.htm>). Also considered were the screening values that are found in the Regional Screening Levels Tables dated May 2014. The unrestricted land use action levels for cadmium and selenium are the residential RSLs.

<sup>1</sup> The listed industrial, agricultural, and recreational land use action levels are located in the document entitled, *Final Preliminary Remediation Goals Report for Addressing Risks to Human Health From Exposure to Chemicals in Kennecott Soils*, December 30, 1999. These action levels are applicable site wide, absent operable unit specific risk based concentrations listed in the November 1998, September 2001, and September 2002 Records of Decision.

<sup>2</sup> For Operable Unit #1, the residential and commercial action levels for lead (respectively 1100 mg/kg and 2000 mg/kg lead) are obtained from two documents: (1) U.S. EPA Region 8 June 1995 Action Memo for the Bingham Creek Phase III residential removal action, and (2) U.S. EPA Region 8 February 1993 Unilateral Administrative Orders to Kennecott and ARCO (CERCLA-VIII-93-10) for the Bingham Creek Channel removal action. The residential action level for arsenic (100 mg/kg) is obtained from the November 1998 Record of Decision for Operable Unit 1.

<sup>3</sup> For Operable Unit #3, the action levels for residential, day care and playground land use application are obtained from the September 28, 2001 Record of Decision. The arsenic and lead action levels for these land use applications are based on speciation and exposure pathways which were considered as part of the risk assessment performed for the City of Herriman.

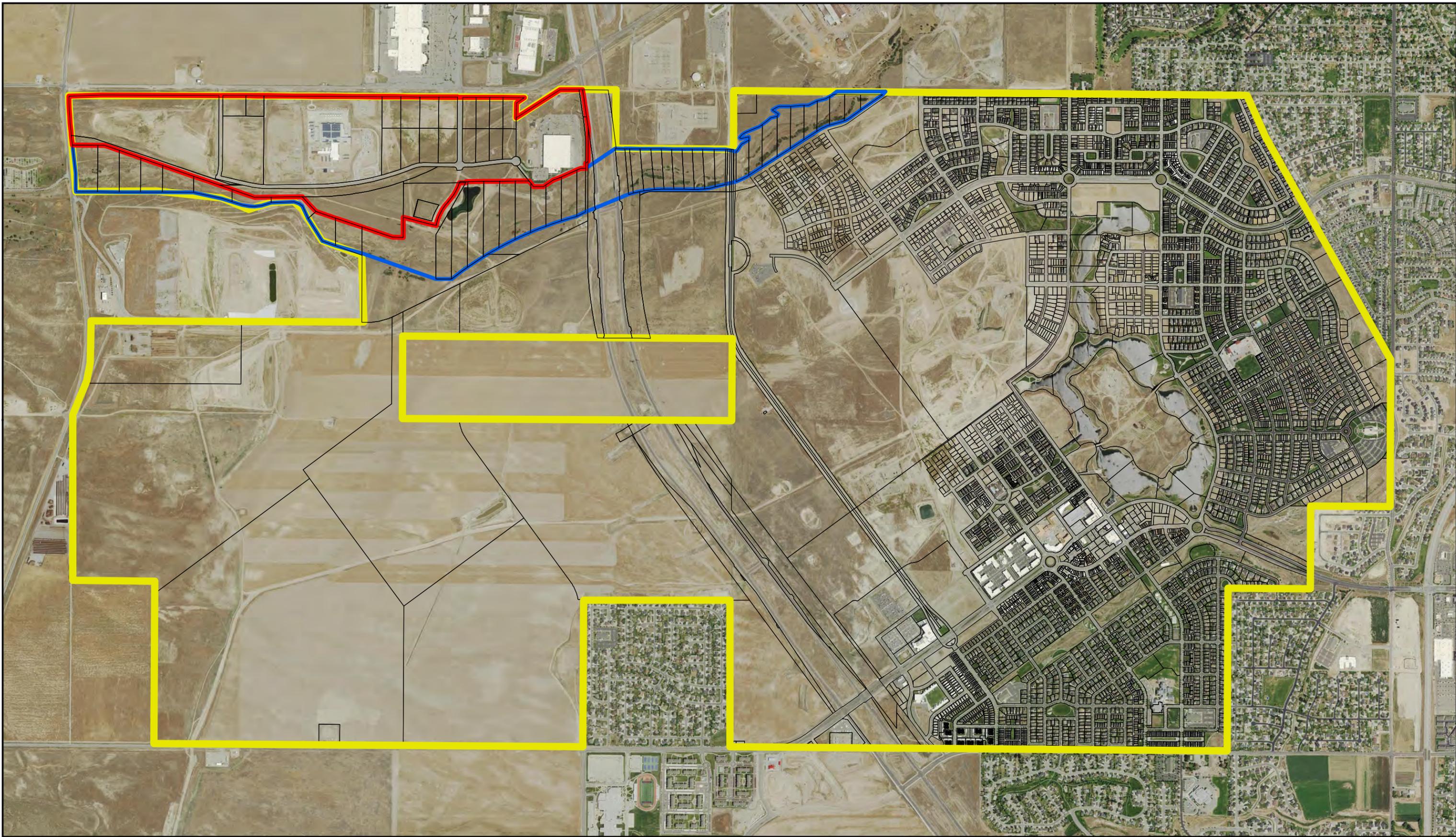
<sup>4</sup> Commercial and Residential action levels for undeveloped areas within the Daybreak Master Planned Community were proposed by Kennecott Utah Copper in the May 26, 2006 Exponent document entitled *Evaluation of Cleanup Levels for Arsenic and Lead in Soil for Undeveloped Portions of the Daybreak Area* and accepted by the CERCLA Agencies in a letter dated September 22, 2006.

<sup>5</sup> The listed industrial, agricultural, and recreational land use action levels are located in the document entitled, *Final Preliminary Remediation Goals Report for Addressing Risks to Human Health From Exposure to Chemicals in Kennecott Soils*, December 30, 1999, and as modified in the *Record of Decision* dated September 28, 2001 for Operable Unit #3.

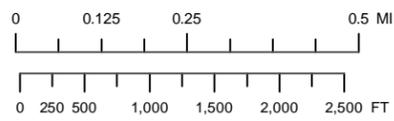
<sup>6</sup> The listed industrial, agricultural, and recreational land use action levels are located in the document entitled, *Final Preliminary Remediation Goals Report for Addressing Risks to Human Health From Exposure to Chemicals in Kennecott Soils*, December 30, 1999, and as modified in the *Record of Decision Kennecott North Zone Site/Kennecott South Zone Site*, September 26, 2002.

<sup>7</sup> The listed industrial, agricultural and recreational land use action levels are obtained from the document entitled, *Final Preliminary Remediation Goals Report for Addressing Risks to Human Health From Exposure to Chemicals in Kennecott Soils*, December 30, 1999. At the time of land use change, the location of a historic site needs to consider the operable unit specific applicable land use standards (listed in the November 1998, September 2001 and September 2002 Records of Decision) to ascertain if an operable unit specific risk based land use standard is applicable.

<sup>8</sup> There are discrete parcels located within the Bingham Creek Channel and in the Daybreak Commerce Park that were considered in 2006 to be part of the overall Daybreak Community. The May 26, 2006 Exponent document entitled *Evaluation of Cleanup Levels for Arsenic and Lead in Soil for Undeveloped Portions of the Daybreak Area* addressed the establishment of residential and commercial land use action levels for the Daybreak Community as defined in the Exponent document and represented herein on Figure 1-A. Though limited, site specific data from the portions of Bingham Creek Channel and the Daybreak Commerce Park areas (located within the Daybreak Community) were included in the risk assessment. The CERCLA Agencies in a letter dated September 22, 2006 accepted the proposed land use action levels for the Daybreak Community. Figure 1-B herein portrays those portions of OU1 which are subject to the residential and commercial land use action levels for arsenic and lead, for the Daybreak Community.



Rio Tinto  
Kennecott Copper

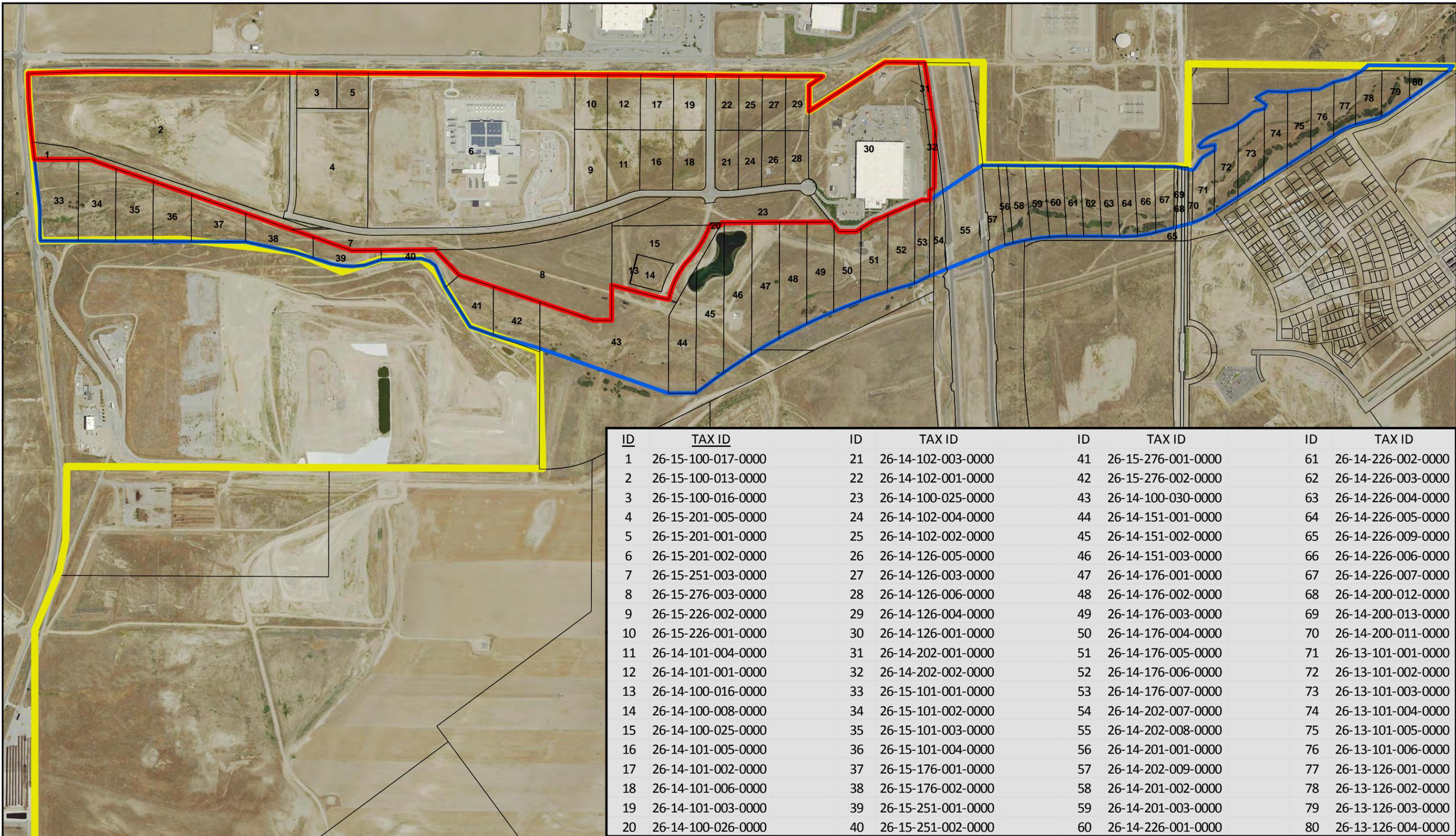


 Daybreak Development

 Commerce Park

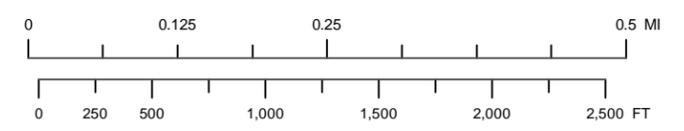
 Bingham Creek Drainage

**DAYBREAK DEVELOPMENT**  
FIGURE 1-A



ID	TAX ID						
1	26-15-100-017-0000	21	26-14-102-003-0000	41	26-15-276-001-0000	61	26-14-226-002-0000
2	26-15-100-013-0000	22	26-14-102-001-0000	42	26-15-276-002-0000	62	26-14-226-003-0000
3	26-15-100-016-0000	23	26-14-100-025-0000	43	26-14-100-030-0000	63	26-14-226-004-0000
4	26-15-201-005-0000	24	26-14-102-004-0000	44	26-14-151-001-0000	64	26-14-226-005-0000
5	26-15-201-001-0000	25	26-14-102-002-0000	45	26-14-151-002-0000	65	26-14-226-009-0000
6	26-15-201-002-0000	26	26-14-126-005-0000	46	26-14-151-003-0000	66	26-14-226-006-0000
7	26-15-251-003-0000	27	26-14-126-003-0000	47	26-14-176-001-0000	67	26-14-226-007-0000
8	26-15-276-003-0000	28	26-14-126-006-0000	48	26-14-176-002-0000	68	26-14-200-012-0000
9	26-15-226-002-0000	29	26-14-126-004-0000	49	26-14-176-003-0000	69	26-14-200-013-0000
10	26-15-226-001-0000	30	26-14-126-001-0000	50	26-14-176-004-0000	70	26-14-200-011-0000
11	26-14-101-004-0000	31	26-14-202-001-0000	51	26-14-176-005-0000	71	26-13-101-001-0000
12	26-14-101-001-0000	32	26-14-202-002-0000	52	26-14-176-006-0000	72	26-13-101-002-0000
13	26-14-100-016-0000	33	26-15-101-001-0000	53	26-14-176-007-0000	73	26-13-101-003-0000
14	26-14-100-008-0000	34	26-15-101-002-0000	54	26-14-202-007-0000	74	26-13-101-004-0000
15	26-14-100-025-0000	35	26-15-101-003-0000	55	26-14-202-008-0000	75	26-13-101-005-0000
16	26-14-101-005-0000	36	26-15-101-004-0000	56	26-14-201-001-0000	76	26-13-101-006-0000
17	26-14-101-002-0000	37	26-15-176-001-0000	57	26-14-202-009-0000	77	26-13-126-001-0000
18	26-14-101-006-0000	38	26-15-176-002-0000	58	26-14-201-002-0000	78	26-13-126-002-0000
19	26-14-101-003-0000	39	26-15-251-001-0000	59	26-14-201-003-0000	79	26-13-126-003-0000
20	26-14-100-026-0000	40	26-15-251-002-0000	60	26-14-226-001-0000	80	26-13-126-004-0000

**Rio Tinto**  
Kennecott Copper



DaybreakDevelopment

Commerce Park

Bingham Creek Drainage

**DAYBREAK DEVELOPMENT**  
FIGURE 1-B

**Attachment 2**  
**Table of Groundwater Action Levels**  
**for Kennecott North and South Zones**

**Site Wide Summary of Groundwater Action Levels for Kennecott North and South Zones  
(units are mg/kg, parts per million, except where otherwise noted)**

Groundwater Use	pH	Sulfate <sup>8</sup>	TDS <sup>8</sup>	D-As	D-B <sup>9</sup>	D-Ba-	D-Cd	D-Cr	D-Cu	D-Pb	T-Hg	D-Ni	D-Se
	Std. Units	mg/L	mg/L	Reported mg/L (Dissolved) (except where noted)									
<b>OU2<sup>1</sup> South End Groundwater, Zone A Acid Plume (SOUTH ZONE)</b>													
Drinking	6.5 - 8.5	1500 (A) // 500 (P) <sup>A</sup>	NA <sup>A</sup>	0.01 <sup>B</sup>		2.0	0.005	0.1	1.3 <sup>C</sup>	0.015 <sup>D</sup>	0.002	0.1	0.05
<b>OU2<sup>1</sup> South End Groundwater, Zone A Sulfate Plume (SOUTH ZONE)</b>													
Drinking	6.5 - 8.5	1500 (A) // 500 (P) <sup>A</sup>	NA <sup>A</sup>	0.01 <sup>B</sup>		2.0	0.005	0.1	1.3 <sup>C</sup>	0.015 <sup>D</sup>	0.002	0.1	0.05
<b>OU2<sup>1</sup> South End Groundwater, Zone B Plume<sup>2</sup> (SOUTH ZONE)</b>													
Drinking	6.5 - 8.5	500	1000	0.01 <sup>B</sup>		2.0	0.005	0.1	1.3 <sup>C</sup>	0.015 <sup>D</sup>	0.002	0.1	0.05
<b>OU12<sup>3</sup> Eastside Collection System (SOUTH ZONE)</b>													
Non-Drinking <sup>4</sup>	Refer to Footnote 4												
<b>OU16<sup>3</sup> Bingham Creek Underflow (SOUTH ZONE)</b>													
Non-Drinking <sup>5</sup>	Refer to Footnote 5												
<b>OU23<sup>3</sup> North Zone Groundwater (NORTH ZONE)</b>													
Non-Drinking <sup>6</sup>	Refer to Footnote 6												
Drinking <sup>7</sup>	6.5 - 8.5	500	1000	0.01 <sup>B</sup>		2.0	0.005	0.1	1.3 <sup>C</sup>	0.015 <sup>D</sup>	0.002	0.1	0.05

**Notes for Site Wide Summary of Groundwater Action Levels for Kennecott North and South Zones**

<sup>†</sup> This table summarizing CERCLA selected action levels and State of Utah protection limitations for groundwater is intended for use only at the Kennecott South and North Zones where mining influenced groundwater is managed.

<sup>1</sup> The action levels listed are derived from UAC R309-200-5 (State of Utah Primary Drinking Water Standards) and the June 2007 ESD for OU2. Review of the April 2014 remedial progress report determined that for the 2012 and 2013 data sets there were some samples of groundwater extracted from the Zone A acid plume which contained un-speciated chromium results in exceedance of the State Primary Drinking Water Standard. Thus chromium is added until it can be demonstrated that this standard is complied with throughout the entirety of the Zone A plume.

<sup>2</sup> The December 2000 Record of Decision denotes that EPA Region 8 was deferring the selection of a remedy for the Zone B Plume pursuant to the State of Utah's Natural Resource Damage project addressing the mining influence to the aquifer in Zone B. The project being implemented in Zone B pursuant to the 2004 NRD Three Party Agreement (as amended in 2009) is producing treated water (in compliance with municipal water quality standards) from extracted groundwater from the impacted aquifer in Zone B. The contaminant specific limitations listed are derived from R309-200-5 for reference purposes (and are applicable for the treated water).

<sup>3</sup> The action levels listed (or referenced) are pursuant to the selected remedies for these three operable units and the 1995 Memorandum of Understanding. Kennecott manages mining influenced groundwater (in part) under the requirements of the State of Utah Groundwater Protection Program.

<sup>4</sup> Pursuant to the Utah Groundwater Protection Program, to ensure the protection of the underlying aquifer, discharge limits for the following contaminants are listed in Table 1 of Permit #UGW350010: pH, Sulfate, TDS, Cd-D, Cu-D, and Zn-D. The compliance limits are established from background concentrations at each compliance well (pursuant to R317-6-4). The permit can be found at: <http://www.waterquality.utah.gov/GroundWater/gwpermits/index.htm>

<sup>5</sup> Pursuant to the Utah Groundwater Protection Program, to ensure the protection of the underlying aquifer, discharge limits for the following contaminants are listed in Table 2 of Permit #UGW350010: pH, Sulfate, TDS, Cd-D, Cu-D, and Zn-D. The compliance limits are

**Notes for Site Wide Summary of Groundwater Action Levels for Kennecott North and South Zones**

established from background concentrations at each compliance well (pursuant to R317-6-4). The permit can be found at: <http://www.waterquality.utah.gov/GroundWater/gwpermits/index.htm>

<sup>6</sup> Pursuant to the Utah Groundwater Protection Program, to ensure the protection of the underlying aquifer, discharge limits for the following contaminants are listed in Table 3 of Permit #UGW350008 (Smelter): pH, Chloride, Sulfate, TDS, As-D, Ba-D, Cd-D, Cr-D, Cu-D, PB-D, Se-D, Zn-D; Table 1 of Permit #UGW350011 (Tailings Impoundment): pH, Sulfate, TDS, As-D, Ba-D, Cd-D, Cr-D, Cu-D, Pb-D, Se-D, Zn-D, Table 1 of Permit #UGW350015 (North Concentrator): pH, Sulfate, TDS, As-D, B-D, Cd-D, Cr-D, Cu-D, Pb-D, Se-D, Zn-D. The compliance limits are established from historical trends at each compliance well (pursuant to R317-6-4). The permits can be found at: <http://www.waterquality.utah.gov/GroundWater/gwpermits/index.htm>

<sup>7</sup> Absent the mining influence and naturally occurring elevated TDS at OU23, the aquifer represents a potential source of drinking water for nearby communities. Though a drilling restriction (to prevent the development of the aquifer as a source of drinking water) is pending, the State of Utah Primary Drinking Water Standards (R309-200-5) are relevant if the impacted aquifer is somehow developed as a source of drinking water in the future.

<sup>8</sup> Pursuant to R309-200-5 (1)(c)(2) & (1)(c)(3) the State of Utah Primary Drinking Water Standards for Sulfate (500 mg/L) and TDS (1000 mg/L) can be allowed by the Division of Drinking Water Board to be higher. As it pertains to sulfate, (1)(c)(2), if the primary standard is to be set to 1000 mg/L a supplier will demonstrate: (a) no better quality water is available, and (b) the water is not for human consumption from commercial establishments. As it pertains to TDS, (1)(c)(3), if TDS is greater than 1000 mg/L (i.e. 2000 mg/L), a supplier shall demonstrate that no better water is available.

<sup>9</sup> Pursuant to the Groundwater Protection Permit #UGW350015 DWQ has established a permit limitation for Dissolved Boron due to the storage and use of coal at the RTKC Power Plant. Refer to note 6 and the reference to Permit #UGW350015 therein.

<sup>A</sup> The OU2 selected remedy (Dec. 2000 Record of Decision) requires active ("A") cleanup of the Zone A plume (extract and treat) until it can be demonstrated that sulfate concentrations comply with the site specific action level of 1,500 mg/L and drinking water standards for metals are attained. Thereafter, a passive ("P") cleanup requirement (monitored natural attenuation) is to be used to document that sulfate concentrations comply with the State of Utah Primary Drinking Water Standard for sulfate of 500 mg/L. No TDS action level was established under the selected remedy.

<sup>B</sup> Pursuant to R309-200-5(5) the primary drinking water standard for arsenic is 0.010 mg/L as of January 23, 2006.

<sup>C</sup> Pursuant to UAC R309-200-5(2)(b) "the copper action level is exceeded if the concentration of copper in more than 10 percent of tap water samples collected during any monitoring period conducted in accordance with R309-210-6(3) is greater than 1.3 mg/L (i.e. if the 90th percentile copper level is greater than 1.3 mg/L).

<sup>D</sup> Pursuant to UAC R309-200-5(2)(a) "the lead action level is exceeded if the concentration of lead in more than 10 percent of tap water samples collected during any monitoring period conducted in accordance with R309-210-6(3) is greater than 0.015 mg/L (i.e. if the 90th percentile lead level is greater than 0.015 mg/L).

**Appendix C**  
**References**

## BINGHAM CREEK RECORD OF DECISION

OU1: Bingham Creek & Flood Plain – Surface Contamination (South Zone)

### DECISION DOCUMENTS

May 7, 1991 Action Memorandum  
Jan 28, 1993 Action Memorandum  
Jul 17, 1995 Action Memorandum  
Nov 3, 1998 Bingham Creek Record of Decision

### FIVE-YEAR REVIEWS

Jun 1, 2004 First Five-Year Review  
Sep 29, 2010 Second Five-Year Review

### ADMINISTRATIVE ORDERS

Administrative Order on Consent: Kennecott  
May 20, 1991 Docket No. CERCLA-VIII-91-11  
Jun 23, 1992 Docket No. CERCLA-VIII-92-10  
Unilateral Administrative Order on Consent (Bingham Creek Phase II): ARCO and Kennecott  
Feb 18, 1993 Docket No. CERCLA-VIII-93-10  
Unilateral Administrative Order on Consent: ARCO  
Jul 21, 1995 Docket No. CERCLA-VIII-95-19, amended Oct 31, 1995

### CONSENT DECREES

Bingham Creek Consent Decree: Kennecott  
Jun 14, 1999 Civil Action No. 2:99-V-0473K, U.S. District Court, District of Utah, Central Division  
ARCO Consent Decree: ARCO  
Dec 16, 1999 Civil Action No. 2:95-cv-0698, U.S. District Court, District of Utah, Central Division

OU4: Large Bingham Reservoir (South Zone)

### DECISION DOCUMENTS

Sep 27, 1995 Memorandum of Understanding among EPA, UDEQ and Kennecott  
Feb 21, 1995 Action Memorandum  
Nov 3, 1998 Bingham Creek Record of Decision

### FIVE-YEAR REVIEWS

Jun 1, 2004 First Five-Year Review  
Sep 29, 2010 Second Five-Year Review

### ADMINISTRATIVE ORDER

Administrative Order on Consent: Kennecott  
Sep 19, 1991 Docket No. CERCLA-VIII-92-10

### CONSENT DECREE

Bingham Creek Consent Decree: Kennecott  
Jun 14, 1999 Civil Action No. 2:99-V-0473K, U.S. District Court, District of Utah, Central Division

### STATE PERMIT

Dec 16, 2010 Utah Groundwater Discharge Permit (UGA 350006)

OU5: Anaconda/ARCO Tailings (South Zone)

### DECISION DOCUMENTS

Aug 5, 1993 Action Memorandum  
Nov 3, 1998 Bingham Creek Record of Decision

### FIVE-YEAR REVIEWS

Jun 1, 2004 First Five-Year Review  
Sep 29, 2010 Second Five-Year Review

### ADMINISTRATIVE ORDERS

Unilateral Administrative Order on Consent: ARCO  
Jan 15, 1993 Docket No. CERCLA-VIII-93-06  
Administrative Order on Consent: Kennecott  
Jan 8, 1998 Docket No. CERCLA-VIII-98-09

## BINGHAM CREEK RECORD OF DECISION

### CONSENT DECREE

ARCO Consent Decree: Kennecott

Dec 16, 1999 Civil Action No. 2:95-cv-0698, U.S. District Court, District of Utah, Central Division

OU10: Copperton Soils (South Zone)

### DECISION DOCUMENTS

Nov 3, 1998 Bingham Creek Record of Decision

### FIVE-YEAR REVIEWS

Jun 1, 2004 First Five-Year Review

Sep 29, 2010 Second Five-Year Review

**ADMINISTRATIVE ORDER** None

**CONSENT DECREE** Pending, to be negotiated

OU11: Kennecott Historic Facilities

*This OU was previously called Bingham Canyon Historic Facilities, but to better depict the operational unit, the OU will now be referred to as Kennecott Historic Sites*

### DECISION DOCUMENTS

Sep 27, 1995 Memorandum of Understanding among EPA, UDEQ and Kennecott

Nov 3, 1998 Bingham Creek Record of Decision

### FIVE-YEAR REVIEWS

Jun 1, 2004 First Five-Year Review

Sep 29, 2010 Second Five-Year Review

**ADMINISTRATIVE ORDER** None

### CONSENT DECREE

Bingham Creek Consent Decree: Kennecott

Jun 14, 1999 Civil Action No. 2:99-V-0473K, U.S. District Court, District of Utah, Central Division

OU17: Bastian Ditch & Sink (South Zone)

### DECISION DOCUMENT

Nov 3, 1998 Bingham Creek Record of Decision

### FIVE-YEAR REVIEW

Sep 30, 2009 First Five-Year Review (*No further five-year reviews required*)

### ADMINISTRATIVE ORDERS

Unilateral Administrative Order on Consent: ARCO

Jan 25, 1993 Docket No. CERCLA-VIII-93-06

Administrative Order on Consent: Kennecott

Aug 31, 1998 Docket No. CERCLA-VIII-98-09 (*Also applies to OU6*)

### CONSENT DECREES

Jun 14, 1999 Bingham Creek Consent Decree: Kennecott

Civil Action No. 2:99-V-0473K, U.S. District Court, District of Utah, Central Division

Dec 16, 1999 ARCO Consent Decree: ARCO

Civil Action No. 2:95-cv-0698, U.S. District Court, District of Utah, Central Division

## OU2 GROUND WATER RECORD OF DECISION

OU2: Southwest Jordan River Valley Ground Water Plumes (South Zone)

### DECISION DOCUMENTS

Sep 27, 1995 Memorandum of Understanding among EPA, UDEQ and Kennecott  
Dec 13, 2000 OU2 Ground Water Record of Decision  
Jun 23, 2003 Explanation of Significant Difference  
Jun 12, 2007 Explanation of Significant Difference

**FIVE-YEAR REVIEW** First Five-Year Review scheduled for Jun 2015

**ADMINISTRATIVE ORDER** None

### CONSENT DECREE

South Zone Groundwater Consent Decree: U.S., State of Utah and Kennecott  
May 21, 2008 Civil Action No. 2:07-cv-00485, U.S. District Court, District of Utah, Central Division

### STATE INSTITUTIONAL CONTROL

Jun 25, 2002 Salt Lake Valley Groundwater Management Plan

OU12: East Side Collection System (South Zone)

### DECISION DOCUMENTS

Sep 27, 1995 Memorandum of Understanding among EPA, UDEQ and Kennecott  
Dec 13, 2000 OU2 Ground Water Record of Decision

**FIVE-YEAR REVIEW** First Five-Year Review scheduled for Jun 2015

**ADMINISTRATIVE ORDER** None

### CONSENT DECREE

South Zone Groundwater Consent Decree: Kennecott  
May 21, 2008 Civil Action No. 2:07-cv-00485, U.S. District Court, District of Utah, Central Division

### STATE PERMIT

Mar 23, 2010 UDEQ Groundwater Discharge Permit No. UGW 350010

OU16: Bingham Creek Underflow (South Zone)

### DECISION DOCUMENTS

Sep 27, 1995 Memorandum of Understanding among EPA, UDEQ and Kennecott  
Dec 13, 2000 OU2 Ground Water Record of Decision

**FIVE-YEAR REVIEW** First Five-Year Review scheduled for Jun 2015

**ADMINISTRATIVE ORDER** None

### CONSENT DECREE

South Zone Groundwater Consent Decree: U.S., State of Utah and Kennecott  
May 21, 2008 Civil Action No. 2:07-cv-00485, U.S. District Court, District of Utah, Central Division

### STATE PERMIT

Mar 23, 2010 UDEQ Groundwater Discharge Permit No. UGW 350010

## BUTTERFIELD RECORD OF DECISION

OU3: Butterfield Mine, Butterfield Creek & Herriman (South Zone)

### DECISION DOCUMENTS

Jun 4, 1997 Action Memorandum  
Jul 16, 1997 Action Memorandum  
Sep 28, 2001 Butterfield Record of Decision

### FIVE-YEAR REVIEW

Sep 30, 2009 First Five-Year Review

### ADMINISTRATIVE ORDERS

Administrative Order on Consent: Kennecott  
Sep 19, 1991 Docket No. CERCLA-VIII-91-18  
Jul 9, 1997 Docket No. CERCLA-VIII-97-08, amended Apr 22, 1998  
Aug 25, 1997 Docket No. CERCLA-VIII-97-09

### CONSENT DECREE

Butterfield Consent Decree: Kennecott  
May 21, 2008 Civil Action No. 2:02-cv-1228, U.S. District Court, District of Utah, Central Division

OU6: Lark Tailings & Waste Rock (South Zone)

### DECISION DOCUMENTS

Feb 21, 1995 Action Memorandum  
Sep 28, 2001 Butterfield Record of Decision

### FIVE-YEAR REVIEW

Sep 30, 2009 First Five-Year Review

### ADMINISTRATIVE ORDERS

Administrative Order on Consent: Kennecott  
Sep 19, 1991 Docket No. CERCLA-VIII-92-10  
Aug 31, 1998 Docket No. CERCLA-VIII-98-09 (*Also applies to OU17*)

### CONSENT DECREE

Butterfield Consent Decree: Kennecott  
May 21, 2008 Civil Action No. 2:02-cv-1228, U.S. District Court, District of Utah, Central Division

OU7: South Jordan Evaporation Ponds (South Zone)

### DECISION DOCUMENT

Sep 28, 2001 Butterfield Record of Decision

### FIVE-YEAR REVIEW

Sep 30, 2009 First Five-Year Review

### ADMINISTRATIVE ORDER

Administrative Order on Consent: Kennecott  
Sep 13, 1994 Docket No. CERCLA-VIII-94-18

### CONSENT DECREE

Butterfield Consent Decree: Kennecott  
May 21, 2008 Civil Action No. 2:02-cv-1228, U.S. District Court, District of Utah, Central Division

## KENNECOTT NORTH ZONE & SOUTH ZONE RECORD OF DECISION

OU8: Waste Water Treatment Plant & Sludge Ponds (North Zone)

**DECISION DOCUMENT**

Sep 26, 2002 Kennecott North Zone & South Zone Record of Decision  
(Also referred to in some documents as the "Final ROD")

**FIVE-YEAR REVIEW**

Jun 17, 2014 First Five-Year Review

**ADMINISTRATIVE ORDER**

Administrative Order on Consent: Kennecott  
Jun 10, 1996 Docket No. CERCLA-VIII-95-04

**CONSENT DECREE** Pending, to be negotiated

OU9: Magna Soils (North Zone)

**DECISION DOCUMENT**

Sep 26, 2002 Kennecott North Zone & South Zone Record of Decision

**FIVE-YEAR REVIEW**

Jun 17, 2014 First Five-Year Review (No further five-year reviews required)

**ADMINISTRATIVE ORDER** None

**CONSENT DECREE** Pending, to be negotiated

OU13: Smelter & Acid Plants (North Zone)

**DECISION DOCUMENTS**

Sep 27, 1995 Memorandum of Understanding among EPA, UDEQ and Kennecott  
Sep 26, 2002 Kennecott North Zone & South Zone Record of Decision

**FIVE-YEAR REVIEW**

Jun 17, 2014 First Five-Year Review

**ADMINISTRATIVE ORDER**

Administrative Order on Consent: Kennecott  
Jun 10, 1996 Docket No. CERCLA-VIII-95-04

**CONSENT DECREE** Pending, to be negotiated

**STATE PERMIT**

Nov 20, 2013 UDEQ Groundwater Discharge Permit No. UGW 350008

OU14: Refinery (North Zone)

**DECISION DOCUMENT**

Sep 26, 2002 Kennecott North Zone & South Zone Final Record of Decision

**FIVE-YEAR REVIEW**

Jun 17, 2014 First Five-Year Review

**ADMINISTRATIVE ORDER**

Administrative Order on Consent: Kennecott  
Jun 10, 1996 Docket No. CERCLA-VIII-95-04

**CONSENT DECREE** Pending, to be negotiated

OU15: Magna Mills & Tailings Pond (North Zone)

**DECISION DOCUMENTS**

Sep 27, 1995 Memorandum of Understanding among EPA, UDEQ and Kennecott  
Sep 26, 2002 Kennecott North Zone & South Zone Record of Decision

**FIVE-YEAR REVIEW**

Jun 17, 2014 First Five-Year Review

## KENNECOTT NORTH ZONE & SOUTH ZONE RECORD OF DECISION

### ADMINISTRATIVE ORDER

Administrative Order on Consent: Kennecott  
Jun 10, 1996 Docket No. CERCLA-VIII-95-04

**CONSENT DECREE** Pending, to be negotiated

### STATE PERMIT

Jul 14, 2011 UDEQ Groundwater Discharge Permit No. UGW350015 (Power Plant & Tailings Impoundment)

### OU18: Mine Drainage in Toole County (South Zone)

*The name of this OU has been changed from Acid Mine Drainage in Toole County to Mine Drainage in Toole County because it contains mine tunnels/adits, overburden dumps, and water discharge*

### DECISION DOCUMENT

Sep 26, 2002 Kennecott North Zone & South Zone Record of Decision

### FIVE-YEAR REVIEW

Sep 30, 2009 First Five-Year Review

**ADMINISTRATIVE ORDER** None

**CONSENT DECREE** Pending, to be negotiated

### OU19: Smelter Fallout (North Zone)

### DECISION DOCUMENT

Sep 26, 2002 Kennecott North Zone & South Zone Record of Decision

### FIVE-YEAR REVIEW

Jun 17, 2014 First Five-Year Review

### ADMINISTRATIVE ORDER

Administrative Order on Consent: Kennecott  
Jun 10, 1996 Docket No. CERCLA-VIII-95-04

**CONSENT DECREE** Pending, to be negotiated

### OU20: Kennecott-Owned Land in Pine Canyon (South Zone)

### DECISION DOCUMENT

Sep 26, 2002 Kennecott North Zone & South Zone Record of Decision

**FIVE-YEAR REVIEW** Pending, First Five-Year Review

**ADMINISTRATIVE ORDER** None

**CONSENT DECREE** Pending, to be negotiated

### OU24: Precipitation Plant (South Zone)

### DECISION DOCUMENTS

Sep 27, 1995 Memorandum of Understanding among EPA, UDEQ and Kennecott  
Sep 26, 2002 Kennecott North Zone & South Zone Final Record of Decision

**FIVE-YEAR REVIEW** Pending, First Five-Year Review

### ADMINISTRATIVE ORDER

Administrative Order on Consent: Kennecott  
Jun 10, 1996 Docket No. CERCLA-VIII-95-04

**CONSENT DECREE** Pending, to be negotiated

### STATE PERMIT

Feb 26, 2009 UDEQ Groundwater Discharge Permit No. UGW350017 (Copperton Concentrator)