UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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1183309

Ref: 8EPR-SA

ACTION MEMORANDUM-ENFORCEMENT

DATE: December 21, 2010

SUBJECT: Request for a Time-Critical Removal Action at the Rico-Argentine St. Louis Tunnel/Settling Ponds Site in Dolores County, Colorado

FROM: Steven Way, On-Scene Coordinator
Emergency Response Unit

THROUGH: Curtis Kimbel, Supervisor
Emergency Response Unit

TO: David Ostrander, Director
Preparedness, Assessment & Emergency Response Program

Category of Removal: PRP-Lead, Time-Critical

I. PURPOSE

The purpose of this Action Memorandum is to request and document approval of a Time-Critical Removal Action for the proposed removal action described herein. This removal action addresses the St. Louis Tunnel and associated settling ponds at the Rico-Argentine Site in Rico, Dolores County, Colorado ("the Site"). The conditions at this Site meet the criteria set out in the National Contingency Plan ("NCP") at 40 CFR 300.415(b)(2) and thus warrant a removal action. There are no nationally significant or precedent-setting issues associated with the response.

II. SITE CONDITIONS AND BACKGROUND

The CERCLIS ID number for the Site is COD9890952519 – Rico-Argentine Site. The Superfund Site ID number is 08-BU (Rico-Argentine Site) and the Operable Unit is OU01 (Rico Tunnels). Site conditions are such that this removal action is classified as Time Critical.

Generally, the Site includes areas of historical mining. Mining related operations included processing ore and, more recently, water treatment of mine discharges. During historical operations

of the water treatment system, a series of settling ponds were used to settle and store lime/metals precipitation sludge and other mine waste. The sludge and other waste remains onsite.

Mining operations in the district began in the late 1800's as a major silver producing district. Historic mining operations consisted of precious metal mining, base metal production (lead, zinc, and copper) from sulfide ores, and sulfuric acid production from pyrite ores. During the 1930's, the St. Louis Smelting and Refining Company drove the St. Louis Tunnel and crosscut extensions into the east bank of the Dolores River under CMC Hill. In the 1950's, a crosscut from the Argentine Mine on the Silver Creek to the St. Louis Tunnel on the Dolores River was completed. This caused the water level in the Silver Creek area workings to drop 450 feet, reducing the impact of drainage at the Site, but increasing the flow rate from the St. Louis Tunnel (also herein referred to as the "Adit"). In addition, the Rico-Argentine Mining Company began operation of the Dolores River acid plant. The plant was located at the St. Louis Tunnel area and processed 165 tons per day of iron pyrite ore to produce 0.3 million tons of sulfuric acid to supply uranium mills. This operation generated calcine (iron oxide) tailings. They were deposited in what is now considered ponds 11 through 18 (Stephens 1978).

In 1971, the Rico-Argentine Mining Company mining operations ceased and the lower 500 feet of workings were allowed to flood and discharge from the St. Louis Tunnel, through the ponds, into the Dolores River. The Rico-Argentine Mining Company also began operation of a 100,000 ton heap leach pad adjacent to the acid plant to extract gold and silver from dump material from the Newman Hill area. In the mid-1970's, a berm failure at the heap leach pad occurred, resulting in an extensive fish kill in the Dolores River. This led to an immediate closure of the cyanide heap leach pad.

In 1980, the Anaconda Company ("Anaconda") acquired the Site from the Rico-Argentine Mining Company (a division of Crystal Exploration and Production Company). This discharge permit (discussed below) associated with the Site was also transferred to Anaconda. Anaconda began conducting a deep exploration drilling program for molybdenum ore bodies. It also began operating a lime addition plant at the settling ponds to treat the drainage from the St. Louis adit.

In 1986, Anaconda, noting poor treatment efficiencies obtained by the old treatment system, added a new lime-slaking facility. In addition, reportedly, Anaconda removed some materials from the Rico facility and demolished the acid plant and associated structures. The Site was then re-graded, capped with a soil cover, and re-vegetated.

The Colorado Discharge Permit System ("CDPS") permit covered two discharge points associated with the historical operations. Discharge Point 001 was the discharge from the Blaine Tunnel into Silver Creek. Flow from Discharge Point 001 was later redirected underground to the St. Louis Tunnel, where it now drains into the St. Louis Tunnel and discharges at the Adit. The CDPS permit for the second discharge point was at Outfall 001 (Pond 5). It regulated discharges of cadmium, copper, silver, zinc, and lead, and other constituents from Pond 5 into the Dolores River. Numerous violations were noted by the State from 1995 through when the treatment plant operations were abandoned in or around 1996. The St. Louis Tunnel Adit drainage and associated settling ponds, with metals precipitate sludge, remain on the banks of the Dolores River.

Currently, of the 19 original settling ponds, only 10 are actively receiving water discharged from the Adit. Ponds 16, 17, and 19 have been completely back-filled. Pond 13 is completely drained of water, but not back-filled. There is a strong suggestion of calcine tailings from the old acid production plant evidenced by dark, brick-red sediment. Pond 10 is full of water; however there is no visible connection to the rest of the system. Ponds 1 through 4 have been left unused and exhibit some evidence of natural characteristics of plant growth and wildlife. CDPS Outfall 001 currently exits to the Dolores River at Pond 5. Portions of the old lime treatment plant are present near the St. Louis Tunnel Adit area.

A. SITE DESCRIPTION

1. Removal Site Evaluation

The St. Louis Tunnel Adit drains historical mine workings extending several thousand feet into Telescope Mountain and Dolores Mountain to the east and southeast, respectively. The St. Louis Tunnel is or was directly hydraulically connected to the mine workings of the former Pigeon, Logan, Wellington, Mountain Spring, Argentine, Blaine, and Blackhawk Mines. For example, the Blaine Mine Adit was discharging to Silver Creek as late as 2000. Flow was later diverted back into the workings of the Argentine Mine, which connects through a drift to the St. Louis Tunnel. Based on an Atlantic Richfield 2000 sampling report, metals concentrations in the Blaine mine water included 7000 ug/L cadmium, 5200 ug/L copper, 844,000 ug/L iron, 505 ug/L lead, 149,000 ug/L manganese, and 230,000 ug/L zinc. The discharge flow rate from the St. Louis Tunnel adit was reported in 1996 as much as approximately 2,200 gallons per minute ("gpm"), which is greater than 4 cubic feet per

second ("cfs"). The flows are reported to generally range from 2 to 3.3 cfs in the latest State Water Quality Assessment, 2008 ("WQA").

The Adit discharge treatment consisted of a lime addition and precipitation of heavy metals into a series of settling ponds at the Site. As of 1996, the estimated volume of lime-precipitation/metals sludge was in excess of 68,000 cubic yards ('cy") in 10 settling ponds. The settling ponds are unlined and surrounded by earthen dikes/berms. The construction material and geotechnical stability of the dike system is not known. The aerial extent of the system of settling ponds was reported to be within the 100-year floodplain of the Dolores River (Watershed Plan for the East Fork of the Dolores River in Dolores County, Grayling Environmental. August 17, 2006). A recent hydrology analysis (HEC-RAS model) of a limited segment of the river along the reach of the settling ponds indicates that the 100-year flood event would not be expected to overtop the pond system. However, the existing embankments will be impacted by 100-year event flood stage water to within approximately one foot of the top of the settling pond dike. This does not account for potential downstream channel constraints that may develop at the bridge that would likely cause back water levels to rise even higher.

The upper, largest pond, Pond 18, contains the largest estimated volume of impounded treatment sludge (approximately 24,000 cy). It is adjacent to the Dolores River, and has little remaining freeboard at the dike along the river. In June 2010, for example, the sludge and water were measured to be less than 12 inches from the top of the dike embankment. During a second inspection in September 2010, beaver damming caused pond water to overtop the lower pond (Pond 5) banks and bypass the outfall structure. The conditions contribute to erosion and instability.

The stability of the existing pond embankments along the river and between the ponds is not known. The construction of these ponds was completed in the 1950's and the ponds have been modified over time. Geotechnical samples and analysis from the embankments have not been performed to determine stability or safety. The hydraulic conditions that may occur during flood conditions have not been evaluated against the embankment armoring, which is not continuous along the extent of the outside banks of the pond system.

Several sampling events have been conducted in different settling ponds over many years. Settling pond sludge samples in the upper pond (Pond 18) below the St. Louis Tunnel had arsenic 49.4 mg/kg, cadmium 227 mg/kg, copper 4,250 mg/kg, lead 838 mg/kg, manganese 18,600 mg/kg, and zinc 43,900 mg/kg (URS Rico-Argentine Site Reassessment Report, 1996).

A recent sample from the adit flow before it entered the settling ponds showed total zinc concentrations at 8,300 ug/L, and the zinc concentration in the outfall to the Dolores River was 4,100 ug/L (the dissolved zinc concentration was 3,900 ug/L). Sludge volumes in the ponds have increased over the last decade or more. Since active water treatment was discontinued, effluent metals concentrations discharging to the Dolores River have been and are increasing as measured at the original permitted Outfall 002 from the settling ponds. For example, even with the variability in results over the period, a review of sampling data from 2002 to present shows an upward trend in zinc concentrations being released to the Dolores River (UOS-START 9/6/2010). (See Attachment 2, Table 1 Dissolved Metals Concentrations)

In addition to the releases to the river measured at the discharge (Outfall 002), it appears that substantial releases of contaminated mine water to the river alluvium occur from leakage out of the ponds. According to the flow analysis performed during the Colorado School of Mines ("CSM") investigation of the St. Louis Tunnel Adit, discharge flow was 2,200 gpm; Pond 18 inflow was 1,600 gpm; Pond 9 inflow was 1,200 gpm; Pound 5/Outfall 002 was 1,400 gpm. This shows there is an estimated 40 percent loss of flow from the ponds largely due to leakage into the alluvial groundwater system (Characterization of and Treatment Recommendations for the St. Louis Adit Drainage and Associated Settling Ponds; Paser, 1996).

2. Physical Location

The Rico Site is located north of the Town of Rico, in Dolores County, Colorado, in portions of Sections 24 and 25, Township 40 North, and Rage 11 West. The general Site location is shown in Figure 1. Rico is 45 miles due south of Telluride in southwestern Colorado. The Site is adjacent to the Dolores River and extends into Telescope Mountain and its related mine workings. The St. Louis Tunnel Adit and associated settling ponds are located on the eastern edge of Dolores County approximately ½ mile north of the town of Rico. The settling ponds area is on the eastern bank of the Dolores River and occupies about 80 acres at an altitude of 8,800 feet. It is adjacent to the San Juan National Forest.

3. Site Characteristics

The Site is located in the San Juan Mountains, within the Upper Dolores River Watershed. Generally, the Site consists of an Adit (known as the St. Louis Tunnel) and associated underground mine workings and a series of at least 18 ponds historically used for settling water treatment metals precipitate and storing other waste over time. Currently, 10 ponds receive flow from the Adit. The remaining ponds may store dredged sediments and/or were back-filled, or are inactive settling ponds. Several of the remaining lower ponds (below Pond 5) appear to be inactive and are not impacted by current discharges from the mine.

The area is bound to the west by the Dolores River and U.S. Forest Service land on the east. A portion of many of the ponds sit within U.S. Forest Service land boundaries. The remaining land is within several privately-held mining claims with different owners. In some cases, the ownership of specific parcels is uncertain. In 2000, an emergency removal was performed to address overtopping of one of the ponds. EPA's response consisted of raising and reinforcing the riverside embankment of the pond, adding an additional culvert between the pond and downgradient ponds, and installing overflow riprap as a backup drain path.

4. Release or Threatened Release into the Environment of a Hazardous Substance, Pollutant or Contaminant

The recent samples (June 2010) from the mine adit flow before entering the settling ponds showed total zinc concentrations at 8,300 ug/L (dissolved zinc was at 7,700 ug/L). The zinc concentration in the outfall to the Dolores River was 4,100 ug/L (dissolved zinc concentration was at 3,900 ug/L). Other heavy metals being released that may pose a threat include cadmium and copper. Significant releases of this mine water to the alluvial groundwater occur from the settling ponds at the Site. Settling pond sludge contains heavy metals at percent levels (e.g. 4.4% zinc), and some of the ponds high water levels relative to the top of the dikes increase the potential threat that sludge and metals-laden water will overtop the ponds and flow into the Dolores River.

These heavy metals are "hazardous substances" as defined by Section 101(14) of the Comprehensive Environmental, Compensation, and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. Section 9601(14). Accordingly, release of these hazardous substances into the

environment from this Site poses an immediate and substantial threat to public health or the environment (see also Endangerment Determination, Section IV).

5. NPL Status

The Site is not listed on the National Priorities List ("NPL"), and it is not proposed for the NPL. In 1999, the Rico-Argentine Mine and associated mining district were considered for inclusion on the NPL, but the community was opposed to listing at the time.

B. OTHER ACTIONS TO DATE

1. Previous Actions

EPA first became involved in the Rico-Argentine Site by pursuing entities for violations of the Clean Water Act at both the adit and outfall discharge points. There has been one other removal action in 2000 to repair a breach in the containment berms for the settling ponds immediately adjacent to the Dolores River. The removal action occurred because the Rico Development Corporation abandoned operation and maintenance of the lime treatment plant and associated systems in the late 1990's. This action was limited in scope and conducted as an emergency.

2. Current Actions

No Current Actions are underway.

C. STATE AND LOCAL AUTHORITIES' ROLE

1. State and Local Actions to Date

A series of Voluntary Cleanup Program ("VCUP") actions have been implemented to address mine waste contamination within the town of Rico and to address a tailings impoundment at the Rico-Argentine Mine. Neither the State nor local authorities have the resources to conduct this Removal Action at this time. State and local authorities requested EPA assistance and are being consulted throughout Site evaluation and the removal process.

III. THREATS TO PUBLIC WELFARE OR THE ENVIRONMENT, AND STATUTORY OR REGULATORY AUTHORITIES

The levels of surface contamination and the unsecured nature of the settling ponds create ongoing releases from the Site, and support a decision to perform a time critical removal action at the Site. These conditions present a threat to public health and the environment and meet the criteria for initiating a removal action under 40 CFR § 300.415(b)(2) of the NCP.

EPA has considered all of the factors in § 300.415(b)(2) and determined that the following are the basis for EPA's determination of the threat present and appropriate action to be taken:

(i) Actual or potential exposure to nearby human population, animals, or the food chain from hazardous substances or pollutants or contaminates;

Flora and fauna in the surrounding aquatic environment have the potential for exposure to high levels of hazardous substances associated with mine discharge waters from the Site. There is a potential for direct human and animal access to areas of the Site where hazardous substances exist at high concentrations and where off-Site migration of hazardous substances into surface waters, channel bottoms sediment, and wetlands creates additional threats of exposure.

(ii) Actual or potential contamination of drinking water supplies or sensitive ecoystems;

Sensitive ecosystem impacts are potentially occurring due to the ongoing releases to the Dolores River, which is considered a Cold Water Aquatic Life Class 1 by the State of Colorado. The metals concentrations being released into the environment exceed the low flow assimilative capacity of the river segment as determined by the State 2008 Water Quality Analysis ("WQA"). Ongoing discharges from the St. Louis Tunnel adit and the treatment pond system (Outfall 002) into the Dolores River currently exceed metals concentrations for the acute and chronic Colorado Department of Public Health and the Environment ("CDPHE") Water Quality Standards ("WQS") for zinc and cadmium as defined for this stream segment. For example, the zinc concentration at outfall to the Dolores River during June 2010 was 3,900 ug/L, and the chronic WQS for zinc is 269 ug/L.

(iii) Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release;

Treatment ponds bounded by earthen berms adjacent to the Dolores River contain approximately 68,000 cubic yards of precipitated sludges and sediments with high concentrations of zinc, cadmium, copper, and lead. The sediments within the treatment ponds pose a threat of release to the Dolores River. Based on the volume of sludge, the high standing water level in the ponds and the unknown construction quality of the dike system and the predicted water levels during significant flooding, it is reasonable to conclude that the conditions pose a threat of release to the environment. High water levels within the ponds present a threat of overtopping and reducing dike stability, high water levels during flooding events will be above existing riprap armoring causing embankment erosion, and impoundments structures may be subject to failure.

(iv) High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate;

Hazardous substances, such as cadmium and lead, are present in high concentrations at the Site. Limited data from samples reported in 2004 indicates cadmium at 270 mg/kg and lead in excess of 2,000 mg/kg in surface soil. Although the Site investigation is not complete, reported historic activities at the Site did generate mine waste (waste rock, mill tailings, and other waste) that may have contributed to these conditions with even higher concentrations of heavy metals.

(v) Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released;

The Dolores River flows through the valley where the Site is located and is subject to rapid increase in flows and rising water levels during precipitation events. Significant snow pack accumulations are normal for the watershed and snowmelt runoff is a major influence in river flow and water levels adjacent to the settling pond embankments. Flood conditions are predicted to impact the embankments of the waste impoundment ponds, which may lead to a breach in the containment system, releasing hazardous substances to the Dolores River.

(viii) The availability of other appropriate federal or state response mechanisms to respond to the release;

There are no other appropriate response authorities to respond to this condition at this time.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action described in this Action Memorandum, may present an imminent and substantial endangerment to public health, welfare, or the environment.

Based upon available water sampling data (UOS START Memorandum 9/6/2010), the estimated concentrations of zinc and cadmium in the Dolores River ranged from 790-1220 ug/l and 3.76-6.53 ug/l, respectively. Given the most current seasonal low-flow outfall concentration for zinc (December 2004) and the December chronic low-flow conditions calculated in the State WQA, the concentration in the Dolores River would be 790 ug/L. For acute low-flow conditions, the most current low-flow outfall concentration (December 2004) and the December acute low-flow conditions that were calculated for the WQA, the concentration in the Dolores River would be 1220 ug/L.

The acute/chronic water quality standards for zinc and cadmium calculated in the WQS based on a hardness of 247 mg/l are 301/269 ug/l and 3.74/0.84 ug/l, respectively. Based on these estimated concentrations of zinc in the Dolores River, mortality to trout exposed to such levels during their sensitive life stages (i.e. swim-up fry) is anticipated. If the current trends continue and the concentrations of zinc in the outfall approach adit concentrations, the predicted concentrations of zinc in the river would be 1052-1628 ug/L under different low flow conditions. The toxicity modeling predicts between 7 and 17 % mortality of brown trout at their sensitive life stages under these scenarios (Toxicology Memorandum, Wall 9/10/10).

If the containment berms were to fail and sediments were washed into the Dolores River, they would likely exceed both the Threshold Effects Concentrations ("TEC") and Probable Effects Concentrations ("PEC") for the protection of aquatic invertebrates in freshwater sediments (Toxicology Memorandum, Wall 9/10/10). The effects of such an event could lead to fish kills, the destruction of habitat for benthic and aquatic organisms, and ongoing metals leaching into the water throughout the impacted stream segment.

V. EXEMPTION FROM STATUTORY LIMITS

This is to be a PRP-Lead removal action; therefore, an exemption from the statutory limits is not required. This removal will be consistent with long term remedy decisions at the Site, but it is not

an NPL Site. The planned removal action discussed herein, combined with a very short construction season at this location necessitates construction taking more than twelve (12) months to complete.

VI. PROPOSED ACTIONS AND ESTIMATED COSTS

A. PROPOSED ACTIONS

The objective of this removal action includes performing actions necessary to minimize or prevent the on-going release and potential release of hazardous substances (both aqueous and solid waste) being discharged from the St. Louis Tunnel and the associated settling ponds into the Dolores River and surrounding wetlands.

1. Proposed Action Description

There are two general elements to the work required to meet the objectives for this removal action. The first involves removal of metals precipitate sludge from the settling ponds, and the second, water management of the discharge from the St. Louis Tunnel to control flow and/or reduce the metals concentration in the effluent to levels deemed protective of water quality and aquatic life in the Dolores River. Water management may take the form of active water treatment, reduction in flows or a combination thereof to meet effluent limits in the discharge to the river. The actions will be implemented in a phased approach to achieve the stated objective. The phased work will include: 1) actions with the settling ponds and associated sludge; and 2) conducting the necessary investigations and developing the engineering designs required to implement the actions associated with a water management system for adit discharge.

- Remove settling pond sludge from the ponds and placing waste in an engineered on-site repository or approved off-site disposal facility.
- Reduction of water levels within the ponds to maintain the freeboard level within the ponds to prevent potential overtopping of the dike systems. This will be done by monitoring and managing existing flow through the ponds to prevent additional release of waste from the ponds.
- Conduct geotechnical and hydrologic evaluations of the pond containment structures. This stability analysis will determine if additional structural improvement is required and/or engineered erosion controls such as riprap, revetments, or equivalent are needed to protect the remaining treatment/settling pond structures and ensure the waste storage units

are adequately protected against flooding or failure. Actions to address any instability may include: placing liner systems in the ponds to contain mine water and treatment sludges; upgrades on the dikes to increase stability; reconfiguration of ponds to provide long-term stability and protection from floodwaters.

- Sampling and monitoring of surface water, ground water and mine drainage water to characterize the on-going discharges from the ponds to the Dolores River; the water quality within the ponds; and related monitoring to characterize releases from the Adit.
- Conduct an evaluation of the Adit and related mine workings to determine the feasibility of controlling flow by installing an engineered flow-through, hydraulic bulkhead(s) in the Adit or other hydraulic controls in mine openings. Rehabilitation of the collapsed Adit portal is necessary to access the workings to conduct these investigations.
- Conduct an engineering evaluation of the available water treatment technology applicable to mine drainage water treatment. These studies will be conducted such that they provide supporting information and discuss the efficiency of metals removal, metals recovery potential, construction and operating cost, long-term performance and other factors necessary for comparison and selection of the appropriate technology.
- Perform the necessary investigations and engineering studies needed to develop design options to reduce the heavy metals concentrations in the effluent water discharging to the Dolores River. Such designs should ensure protection of water quality, and/or reduce the flow from the Adit and associated workings. This may require an on-site active water treatment system(s), containment of mine water within the underground mine workings and aquifer, reduction of influent to the underground mine workings and the associated hydraulic controls in the mine openings. Pending the completion of the evaluations described above, the details of specific actions will be selected and presented in design reports that will be reviewed and approved by EPA.
- Implement actions consistent with the remedy designs, which may include hydraulic controls in the adit, reducing inflow into the mine workings, and if necessary, water treatment of the St Louis Tunnel adit discharge.
- Temporary water treatment systems will be developed and in place, as necessary, while the aforementioned work is being performed and until such time that a permanent mine

water management system associated with St. Louis Tunnel is completed. This temporary treatment is intended to provide the ability to treat adit and/or pond water effluent to ensure that the Dolores River water quality is protected during these actions.

- As part of the requirements under the Administrative Order and the Statement of Work for this removal action, the PRP will institute appropriate Post-Removal Site Controls ("PRSC"). Anticipated PRSCs include actions necessary to ensure the effectiveness and integrity of the remedy, including but not limited to Operation and Maintenance (O&M) of all features constructed or installed to minimize releases from the Site, protect water quality and meet ARARs as well as any restoration (i.e. revegetation, re-contouring) of areas disturbed during the removal actions.

2. Contribution to Remedial Performance

Once the proposed removal action is complete, no remedial actions would be required.

3. Description of Alternative Technologies

Alternative technologies are generally not applicable for this type of action. However, as appropriate, alternative water treatment technologies will be considered.

4. Engineering Evaluation/Cost Analysis (EE/CA)

An EE/CA is not required for this time critical removal action.

5. Applicable or Relevant and Appropriate Requirements (ARARs)

This removal action will attain, to the extent practicable and considering the exigencies of the situation, all applicable or relevant and appropriate requirements of Federal Law or, where more stringent, Colorado State environmental laws. A list of potential ARARs is provided in Attachment 4.

6. Project Schedule

Water level conditions in Pond 18 require immediate action to reduce the volume of water stored in the pond. Temporary water treatment capabilities will be developed and made ready on-Site during the fall/winter 2010, as determined necessary based on monitoring. The Site is located in the San Juan Mountains, therefore work on the settling ponds will not be able to occur until after the winter and spring runoff. The work will continue into 2011 and 2012 to perform the remainder of the actions.

B. ESTIMATED COSTS

The removal action is planned to be a PRP-lead action. EPA oversight costs will be incurred during the implementation of this removal action. In addition, investigative costs will also be incurred as necessary to select appropriate response actions.

1. Extramural Regional Allowance Costs:

The costs for this removal are not presented below as the work is expected to be performed by the PRP. Should it be necessary to perform some or all of the work as a Fund-lead action, the estimated costs will be presented in an amended Action Memorandum.

Total Errs (Construction)	$
START 3 Costs (Design and Removal Support)	$
~20% Contingency (Construction)	$
TOTAL EXTRAMURAL COSTS	$
REMOVAL PROJECT CEILING	**$**
(This is expected to be a PRP lead action).	

VII. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Delayed or no action will allow the hazardous substances to continue releasing into the Dolores River from the adit and may increase the potential for additional releases from the ponds.

VIII. OUTSTANDING POLICY ISSUES

None.

IX. ENFORCEMENT

A separate Enforcement Memorandum provides a confidential summary of current and potential future enforcement actions.

X. RECOMMENDATIONS

This decision document represents the selected Removal Action for the Rico-Argentine Site near Rico, in Dolores County, Colorado, developed in accordance with CERCLA as amended, and is not inconsistent with the NCP. This decision is based on the administrative record for the Site.

Conditions in the Site meet the NCP § 300.415(b)(2) criteria for a Removal and I recommend your approval of the Time Critical Removal Action. The total project budget has not been estimated based on it being a PRP-lead action.

Approve: _____ Date: 1/11/2011

David A. Ostrander, Director
Preparedness, Assessment, and
Emergency Response

Disapprove: _____ Date:_____

David A. Ostrander, Director
Preparedness, Assessment, and
Emergency Response

Attachments:

1- Site Location and Sampling Figures
2- Data Table 1 Dissolved Metals Concentration
3- Toxicological Endangerment Analysis
4- Applicable or Relevant and Appropriate Requirements (ARARs)

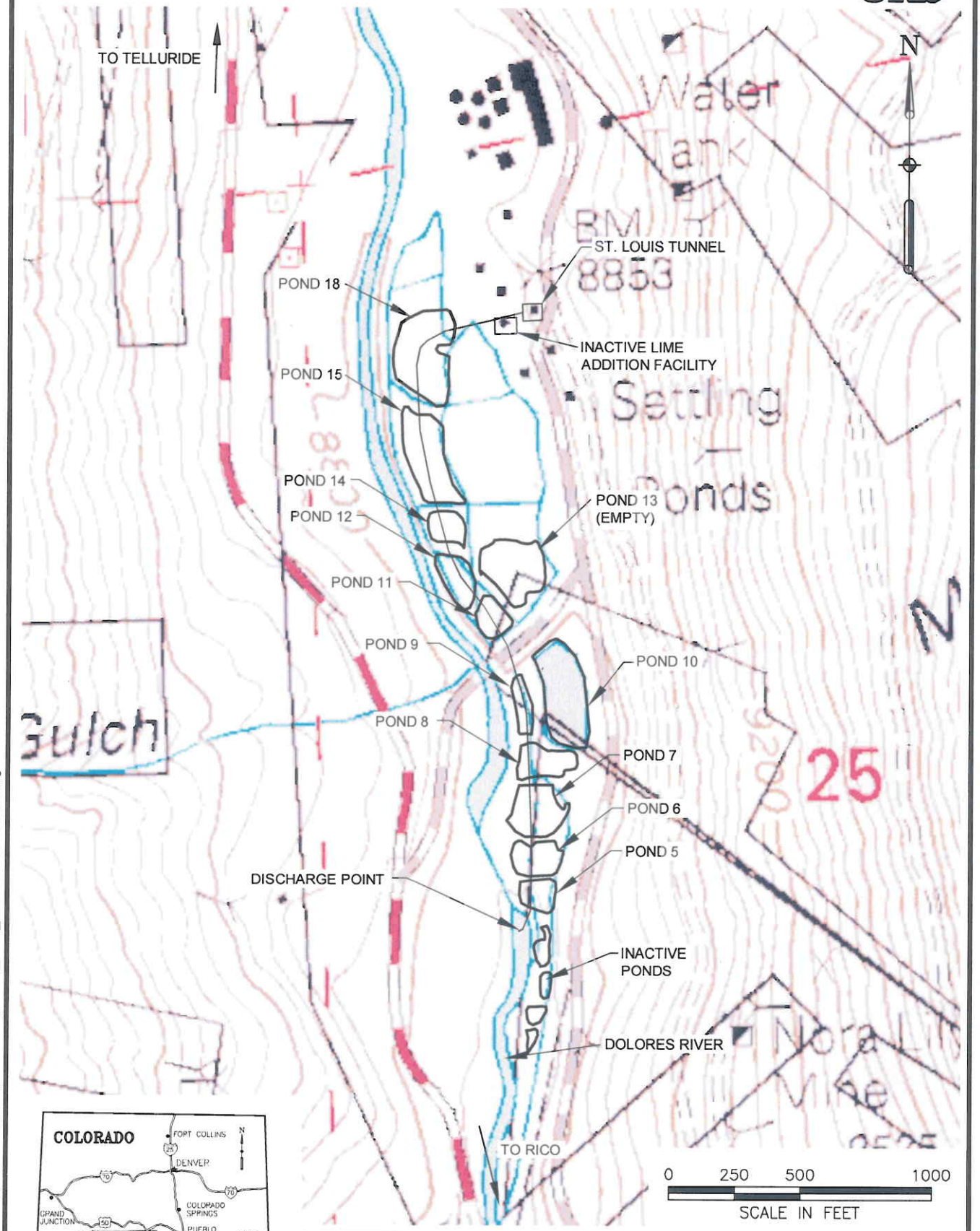
SUPPLEMENTAL DOCUMENTS

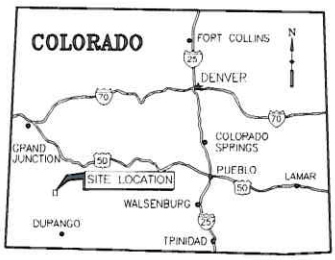
Support/reference documents which may be helpful to the reader and/or have been cited in the report may be found in the Administrative Record File at the Superfund Records Center for Region VIII EPA, 1595 Wynkoop Street, Denver, Colorado 80202.

Printed on Recycled Paper

Attachment 1
Site Map

URS





STATE MAP
NOT TO SCALE

Job No. : 22241923	SITE LAYOUT ST. LOUIS SETTLING PONDS
Prepared by : MN	
Date : 10/11/10	RICO ARGENTINE MINE

N:\Projects\22241923_Argentine_Rico_Mine\Sub_0017.0_CAD_GIS\SITE LAYOUT.dwg

Attachment 2
Table 1 Dissolved Metals Concentrations
(Adit Discharge and Outfall 2 – Dolores River)

TABLE 1

Dissolved Metal Concentrations near St. Louis Tunnel (Metal concentrations in micrograms per liter (µg/L), hardness in milligrams per liter)

Location	Date	Arsenic	Cadmium	Copper	Lead	Manganese	Zinc	Hardness
DR-3 - St. Louis Adit, at portal	10/24/1999	--	12	10 U	1.4	2200	6650	490
	10/25/1999	--	12	10 U	1.4	2200	6650	689
	6/26/2000	--	18	30	0.5 U	2660	3600	639
	6/27/2001	--	21.8	20 B	0.1 U	2300	4510	685
	10/18/2001	--	15.7	20 B	0.1 U	2150	3560	685
	7/16/2002	--	13 B	20	16.7	2050	3430	742
	10/8/2002	--	13.8	22	13.2	1830	2970	762
	10/30/2003	--	21.3	20.6	0.1 U	2170	5190	730
	12/2/2003	--	22	8.2	0.1 B	1930	4000	687
	1/7/2004	--	16.7	14.1	0.2 U	1820	3550	716
	2/3/2004	--	17.7	29.5	0.1 U	1780	3450	707
	3/2/2004	--	15.569	28	0.1192 B	1850	3320	729
	4/27/2004	--	19.9613	27.3	0.1 U	1830	4180	738
	6/1/2004	--	80.3882	217	0.1006 B	4320	13900	724
	7/6/2004	--	35.9311	18.6 B	0.1 U	2750	5700	613
	12/7/2004	0.8 B	24.5	18.5	0.1 U	2230	4200	680
	6/2/2010+	4.4 U	52	91	2.6 U	2400	7700	670
DR-6 - St. Louis Ponds Outfall 002 Discharge	10/24/1999	--	8.7	10 U	0.9	1700	2990	--
	6/26/2000	--	5.9	10 U	0.5 U	1970	1410	793
	6/27/2001	--	12.5	10 U	0.1 U	1940	2470	807
	8/30/2001	--	7.4	10 U	0.9	1380	1820	812
	10/18/2001	--	7.7	10 U	0.1 U	1560	1660	773
	7/16/2002	--	3 U	3 B	0.2 U	505	410	925
	10/8/2002	--	1.7	--	0.1 U	296	400	848
	10/30/2003	--	4.6	9.7	0.1 B	685	1110	905
	12/2/2003	--	15.5	3.1	0.1 U	1930	2880	802
	1/7/2004	--	11	3 B	0.2 U	1750	2420	749
	2/3/2004	--	10.8	3.1	0.1 U	1690	2090	787
	3/2/2004	--	8.4735	3.15 B	0.1 U	1720	1740	763
	4/27/2004	--	7.7287	9.5 B	0.1 U	1070	1690	817
	6/1/2004	--	45.762	1.5 U	1.2221 B	2770	8340	875
	7/6/2004	--	14.9022	1.5 U	0.3435 B	1460	3080	820
	12/7/2004	1.4 B	15	7.6	0.2 B	2080	3140	732
	6/2/2010+	4.4 U	31	3.5 B	2.6 U	2400	3900	740

Data provided by ARCO/SEH except as noted. Water Quality Data_Rico, Colorado_6 Sep 05_1.xls, A. Jewell. SEH, Inc. + Data from Letter Report for Rico-Argentine St. Louis Tunnel Site, Rico, Delores County, Colorado. From Bryan Williams, URS Operating Services, Inc. to Mr. Steven Way, On-Scene Coordinator, Environmental Protection Agency. August 18, 2010. U Analyte not detected at or above the detection limit. B Value is an estimated quantity. -- No data available.

Attachment 3
Toxicological Endangerment Analysis

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
1595 Wynkoop Street
DENVER, CO 80202-1129
Phone 800-227-8917
http://www.epa.gov/region08

September 10, 2010

MEMORANDUM

SUBJECT: Implications of Pond Containment Failures and Risks from Discharge of St. Louis Tunnel Treatment Ponds

FROM: Dan Wall, EPA Toxicologist

TO: Steven Way, EPA On-Scene Coordinator

IMPLICATIONS OF TREATMENT POND FAILURES

The St. Louis Tunnel (SLT) Passive Treatment system sits adjacent to the Dolores River. The treatment system is a series of ponds that are designed to precipitate metals emanating from SLT drainage and as a consequence the sediments from the treatment ponds have become highly contaminated with a variety of metals. Sediment core samples were collected from Ponds 5, 9, 11, and 18, and analyses of these core samples and of sediment samples collected in 2000 and 2003 reveal a roughly uniform composition of metals throughout the pond sludges at depth. The sediments all contain concentrations of Zinc ranging from 18,000 to 37,700 ppm, Cadmium ranging from 51.4 to 190 ppm, Copper ranging from 650 to 2460 ppm, and Lead ranging from 200 ppm to 957 ppm. The following is a discussion of the ecological implications of a treatment pond(s) failing to contain the sediments and releasing them to the Dolores River.

The assessment of the potential toxicity of sediments based on bulk metals concentrations is an imprecise endeavor without additional supporting information. The best available approach for this type of comparison is to compare benchmarks developed in the consensus-based sediment quality guidelines for freshwater ecosystems document (MacDonald et al, 2000) to sediment concentrations. The benchmarks developed in this document include a Threshold Effect Concentration (TEC) and Probable Effect Concentration (PEC). Concentrations below the TEC are considered to be protective of aquatic invertebrate and have been shown to be accurate in at least 72% of the metals contaminated sediments tested. Concentrations above the PEC are considered likely to harm organisms and have been shown to accurately predict toxicity in at least 75% of the tested sediments.

As can be seen in the following table the concentrations of contaminants in the sediments greatly exceed the higher PEC benchmark value with cadmium and zinc exceeding PEC values by up to 2 orders of magnitude. Despite the difficulties associated with assessing the potential toxicity of sediments it is almost a certainty that if treatment pond sediments were released to the Dolores River in sufficient quantity they would be toxic to aquatic invertebrates.

Metal	TEC (ppm)	PEC (ppm)	Sediment Concentration Range (ppm)
Cadmium	1	5	51.4 - 190
Copper	32	149	650 - 2460

Lead	36	128	200 - 957
Zinc	121	459	18,000 – 37,700

The effects would likely run a continuum of severe impacts near the site to minor impacts at some downstream location. The footprint of sediment deposition would be the most severely impacted based on both the physical and chemical effects on the stream bed. Areas inundated with contaminated sediments would eliminate virtually all benthic invertebrate habitat by filling in spaces in the cobble that are needed by most resident insects to survive and by fish to reproduce. Immediate chemical impacts to downstream aquatic populations would likely be observed as a pulse of high metals concentrations released with and from the tailings. Fish kills would be probable. For some extended period of time after the failure, metals from the released sediments would be leached into the stream and would likely produce localized areas of lethal concentrations of metals. Gradually the leachable metals would be depleted and areas that weren't inundated with sediments would begin to recover.

RISKS FROM EXISTING DISCHARGE

The State of Colorado developed a Water Quality Assessment (WQA) for the Mainstem of the Dolores River in October 20008. The WQA proposed monthly chronic and acute WQBELS (water quality based effluent limits) for the protection of the Dolores River. Additionally, as part of the WQA acute and chronic low flow conditions were calculated for the Dolores River. These values, in conjunction with the available analytical results were used to calculate concentrations of metals in the Dolores River under a variety of flow and discharge scenarios.

The predicted concentrations of zinc and cadmium in the Dolores River ranged from 790-1220 ug/l and 3.76-6.53 ug/l, respectively. The acute/chronic water quality standards for zinc and cadmium calculated in the WQA based on a hardness of 247mg/l are 301/269 ug/l and 3.74/0.84 ug/l, respectively. This memo does not address the validity of these calculations and predictions but is limited to providing an opinion on whether the predicted concentrations in the Dolores River pose a risk to fish populations.

Based on these predicted concentrations of zinc in the Dolores River, I would anticipate mortality to occur to trout during their sensitive life stages (i.e. swim-up fry). This is based on 2 lines of evidence.

The first is line of evidence is from results of reference toxicity testing conducted at the EPA Golden Laboratory (Figure 3.3-2). These results are conducted as a positive control with each toxicity test that is conducted with site water. Reference tests are run with rainbow trout using reconstituted laboratory water spiked with zinc as the toxicant. The results of 7 tests conducted since 2005 yield a mean LC50 of 260 ug/l dissolved zinc at a hardness of about 90 mg/l. which translates to 612 ug/l dissolved zinc at a hardness of 247mg/l. These results are presented below. The concentrations predicted to occur in the Dolores River exceed this LC50 value and therefore I would anticipate that if the predicted concentrations were to occur in the river, mortality of sensitive trout life stages would occur. Reliance on laboratory toxicity tests is uncertain due to site specific conditions which may mitigate or exacerbate toxicity.

The second line of evidence is based on EPA (2006) investigations of the toxicity of zinc to brown trout, using both site (Upper Arkansas River) and laboratory waters. The goal of the study was to develop an exposure-response model for brown trout exposed to zinc under a variety of conditions. Five toxicity tests were run including 2 on-site dilution studies, 2 laboratory studies (conducted by Colorado Division of

Wildlife) and an on-site water spiking study. The results led to a model that reliably predicts the percent mortality based on the zinc concentration and hardness. This model is specific to the Upper Arkansas but as is seen in figure 4-2 below, there is good agreement between the laboratory and field results. Using the range of zinc concentrations predicted to occur in the Dolores River under the various scenarios (790-1220 ug/l), the model predicts between 4 and 10% mortality of brown trout at their sensitive life stage.

If the current trends continue and the concentrations of zinc in the outfall approach adit concentrations, the predicted concentrations of zinc in the river are from 1052-1628 ug/L under different low flow conditions. The model predicts between 7 and 17 % mortality of brown trout at their sensitive life stage under these scenarios.

This line of evidence likely predicts less toxicity to brown trout than the reference testing because of several factors, including species differences, use of site water and differences between testing laboratories. Additionally, it is not possible with the available information to determine the distance that the concentrations of zinc would be present at levels that pose risk to fish populations or whether sensitive life stages would be present in this reach of the river.

Figure 3.3-2
Zinc LC 50 Reference Chart

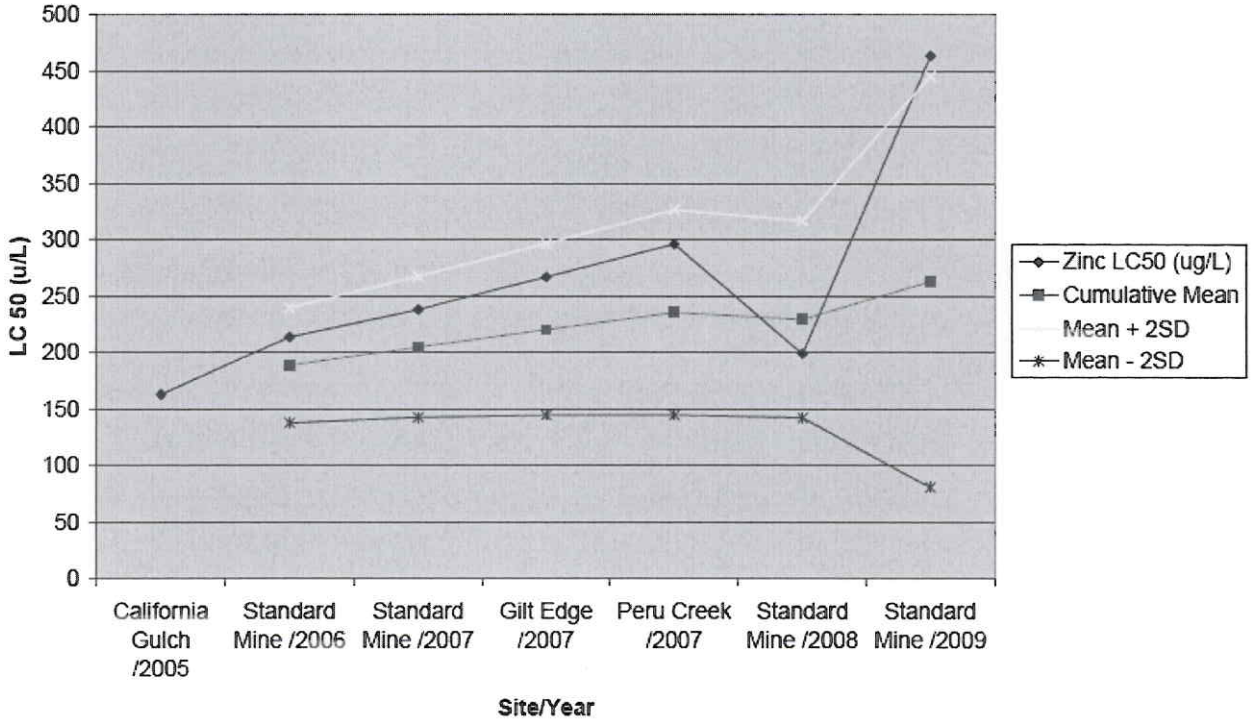
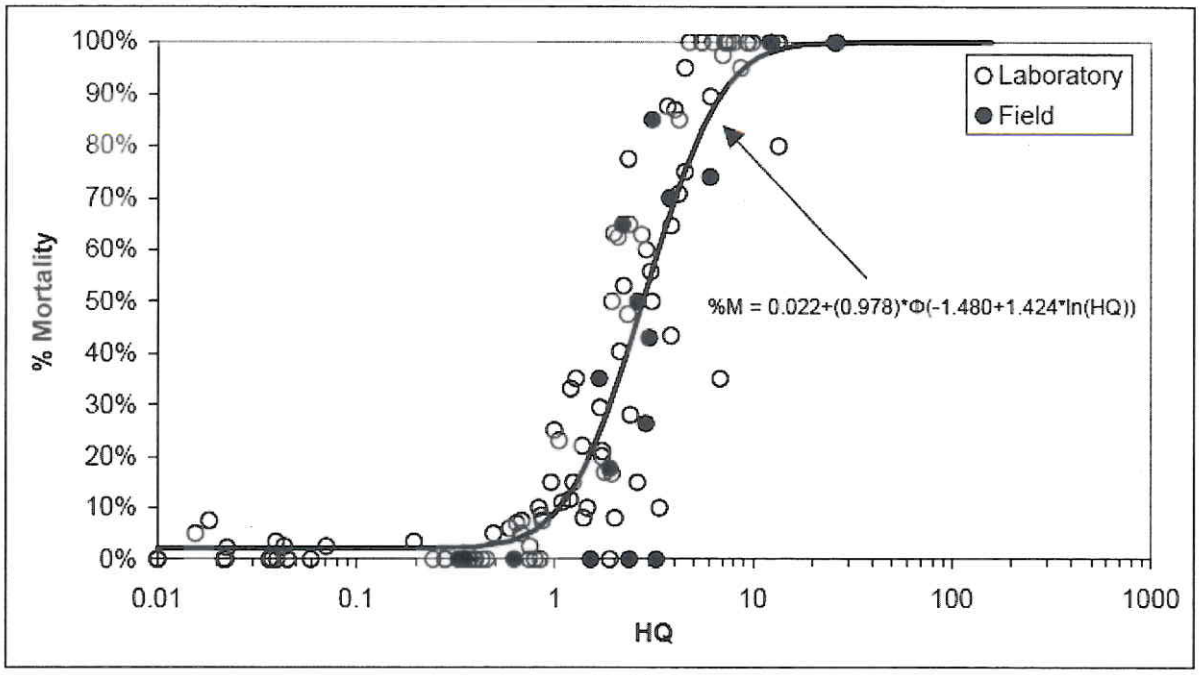


Figure 4-2. Comparison of All Laboratory and Field Studies



MacDonald, D.D., C.G. Ingersoll, and T.A. Berger. 2000. Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Arch. Environ. Contam. Toxicol. 39:20-31.

EPA, 2006. Laboratory and Field Investigations of Zinc Toxicity on Brown Trout in the Upper Arkansas River.

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Attachment 4
Applicable or Relevant and Appropriate Requirements (ARARs) Analysis

CHEMICAL-SPECIFIC ARARs

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable or Relevant and Appropriate	Comments
FEDERAL				
Clean Water Act Federal Water Quality Criteria	40 CFR Part 131 Quality Criteria for Water, 1986, pursuant to 33 USC § 1314	Sets standards for surface water to protect aquatic life and human health.	Yes	This Removal is limited in scope to isolating and treating settling ponds; therefore, other water bodies will not be affected.
National Primary Drinking Water Regulations (MCLs)	40 CFR Part 141, Subpart B pursuant to 42 USC §§ 300g-1 and 300j-9	Regulates drinking water quality.	Relevant and Appropriate	MCLs are applicable for drinking water at the tap and may be relevant and appropriate for drinking water sources.
National Primary Drinking Water Regulation Goals (MCLGs)	40 CFR Part 141, Subpart F, pursuant to 42 USC 300g-1	Sets goals for contaminant levels	Yes	MCLs are applicable for drinking water at the tap and may be relevant and appropriate for drinking water sources.
National Secondary Drinking Water Regulations (SMCLs)	40 CFR Part 143, pursuant to 42 USC §§ 300g-1(c) and 300j-9	Sets standards for drinking water based on health and aesthetics.	Relevant and Appropriate	These regulations are Applicable at the tap.
Clean Air Act, National Primary and Secondary Ambient Air Quality Standards	40 CFR Part 50, pursuant to 42 USC § 7409	Sets standards for air emissions.	Applicable	If anticipated actions include source categories covered by the regulations.
National Emission Standards for Hazardous Air Pollutants	40 CFR Part 61, Subparts N, O, P, pursuant to 42 USC § 7412	Regulates emission of hazardous chemicals to the atmosphere.	Applicable	If regulated constituents present at site.
RCRA Subtitle C Groundwater Protection Standards	40 CFR 264.92-264.101	Sets standards for groundwater at RCRA facilities.	Relevant and Appropriate	This is not a RCRA facility.
STATE				
Colorado Primary Drinking Water Standards	5 CCR 1003-1	Establishes health-based standards for public water systems.	Relevant and Appropriate	MCLs are applicable for drinking water at the tap and may be relevant and appropriate for drinking water sources.
Basic Standards and Methodologies for Surface Water: WQCD Reg. No. 31	5 CCR 1002-31	Provides basic standards, antidegradation rule, implementation process, and system for classifying surface water, assigning water quality standards and review of classifications and standards, as determined by the Colorado WQCC.	Applicable	This Removal is limited in scope to isolating and treating settling ponds.

CHEMICAL-SPECIFIC ARARs

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable or Relevant and Appropriate	Comments
Colorado Classification and Numeric Standards for the Dolores River	5 CRS §§ 25-8-203 and 204)	Classification and numeric standards for the Dolores River Basin, Classification identifies actual beneficial uses of water and allowable concentrations of various parameters.	Applicable	This Removal is limited in scope to isolating and the settling ponds. Over the course of the removal, the ponds will not be receiving or discharging water.
Basic Standards for Groundwater: WQCD Reg. No. 41	5 CCR 1002-41	Sets standards for contaminants in groundwater.	Applicable	This Removal is limited in scope to isolating and treating the settling ponds. Over the course of the Removal, Pond 18 will not be receiving or discharging water.
Colorado Air Pollution Prevention and Control Act, CRS § 25-7-101 et. seq.	5 CCR 1001-10 Part C(I) and (II), Regulation 8	Sets standards for air emissions.	Applicable	If anticipated removal actions include source categories covered by the regulations.
Colorado Emission Standards for Hazardous Air Pollutants	CRS § 25-7-108, 5 CCR 1001-10, Reg. 8	Regulates emission of hazardous chemicals to the atmosphere.	Applicable	If regulated constituents present at site.
Colorado Asbestos Waste Management Regulations	(6 CCR 1007-2 § 5)	Pertains to materials containing asbestos and related disposal	Applicable	If asbestos material from the old lime treatment facility is disposed or managed

ACTION-SPECIFIC ARARs

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable or Relevant and Appropriate	Comments
FEDERAL				
Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976 (RCRA Subtitle D)	40 CFR Part 257, Subpart A: § 257.3-1 Floodplains, paragraph (a); § 257.3-7 Air, paragraph (b)	Regulates the generation, storage, handling and disposal of solid waste.	On-Site: Applicable or Relevant and Appropriate Offsite: Applicable	Relevant and appropriate to in-place capping. Applicable to on-site consolidation or off-site disposal.
RCRA Subtitle C	40 CFR Part 261.4(b)(7) and RCRA Section 3001(b) (Beville Amendment)	Regulates the generation, treatment, storage and disposal of hazardous wastes.	Applicable for non-Beville exempt wastes; Relevant and Appropriate for Beville-exempt waste.	Applicable for disposal of hazardous wastes. Certain mining wastes are Beville exempt.
Standards Applicable to Generation of Hazardous Waste	40 CFR Part 262, pursuant to 42 USC § 6922	Establishes standards for the generation of hazardous waste.	See RCRA Subtitle C	
Standards Applicable to Transporters of Hazardous Waste	40 CFR Part 263, pursuant to 42 USC § 6823	Regulates the transportation of hazardous waste.	See RCRA Subtitle C	
Hazardous Materials Transportation Act, D.O.T. Hazardous Materials Transportation Regulations	49 USC §§ 1801-1813 49 CFR Parts 107, 171-177	Regulates the transportation of hazardous materials.	Potentially Applicable	Applicable if materials are transported off site.
CWA - Dredge and Fill Requirements	40 CFR 230-233, 320-330, Section 404, pursuant to 33 USC § 1251-1376	Prohibits discharge of dredged of fill material into wetlands or navigable waters of the U.S. without permit.	Applicable – substantive requirements	
Underground Storage Tanks	40 CFR Part 280	Establishes regulations for the monitoring, design, and construction of underground storage tanks.	No	None present at site
Underground Injection Control Regulations	40 CFR §§ 144.12, 144.24, and 144.25, pursuant to 42 USC § 123(e)(1)	Establishes requirements for injection of waste water into wells and aquifers.	Applicable	Would apply if injecting to a mine shaft or mine workings.
CWA - National Pollutant Discharge Elimination System (NPDES)	40 CFR Parts 122, 125, pursuant to 33 USC § 1342	Regulates the discharge of pollutants to waters of the U.S.	Applicable – substantive requirements	CERCLA actions are not subject to permitting & administrative requirements or discharges pursuant to Part 122.3(d)

ACTION-SPECIFIC ARARs

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable or Relevant and Appropriate	Comments
STATE (Colorado)				
Colorado Solid Waste Disposal Sites and Facilities Act	6 CCR 1007-2, pursuant to CRS § 30-20-101, et.seq.	Establishes standards for the licensing, locating, constructing, and operating solid waste facilities.	On-Site: Applicable or Relevant and Appropriate Offsite: Applicable	Relevant and appropriate to in-place capping. Applicable to on-site consolidation or off-site disposal. No licensing or permitting is required.
Colorado Hazardous Waste Act	25-15-301 to 327 C.R.S. and 6 CCR 1007-3	Regulates generation, storage and disposal of hazardous waste, and the siting, construction, operation, and maintenance of hazardous waste disposal facilities.	Applicable or relevant and appropriate	Applicable for disposal of listed wastes and for off-site disposal of hazardous wastes generated. Relevant and appropriate for Beville exempt wastes. Mining waste is Beville exempt.
Colorado Mined Land Reclamation Act	CRS 34-32-101 to 125 Rule 3 of Mineral Rules and Regulations	Regulates all aspects of mining, including reclamation plans and socioeconomic impacts.	Applicable	
Colorado Discharge Permit System	5 CCR 1002-61	Implementation of the Colorado Water Quality Control Act, and applies to operations discharging to waters of the state from a point source.	Applicable – substantive requirements	CERCLA actions are not subject to permitting & administrative requirements or discharges pursuant to 40 CFR Part 122.3(d)
Colorado Water Quality Control Act. Storm Water Discharge Regulations	5 CCR 1002-61	Regulates discharge of storm water during construction activities.	Applicable	
Protection of Fishing Streams	CRS 33-5-101 - 107	Establishes notification requirements for modifications to streams.	Applicable	
Reservoirs and Rules and Regulations for Dam Safety and Dam Construction	CRS 37-87-101 - 125, 37-80-(11k), and 24-4-103	Establishes rules and regulations for the design, construction, and operation of dams and reservoirs.	Relevant and Appropriate	Otherwise, Independently applicable if conditions meet definitions of these regulations.
Colorado Air Pollution Prevention and Control Act	5 CCR 1001-3; Section III.D.1.b.c.d; Sections II.D. 2.b.c.e.f.g.; Reg. 1	Regulates fugitive emissions during construction.	No	Contemplated actions would not trigger permit requirements, however dust control will be required.
Colorado Air Pollution Prevention and Control Act	5 CCR 1001-5, Regulation 3 APENs	Establishes requirements for obtaining permits.	No	Contemplated actions would not trigger permit requirements
Colorado Noise Abatement Statute	CRS §§ 25-12-101, eq.seq.	Establishes standards for controlling noise.	Applicable	In areas zoned residential, commercial or industrial

ACTION-SPECIFIC ARARs

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable or Relevant and Appropriate	Comments
Colorado Environmental Real Covenants Act	CRS § 25-15-317 to 327	Requires environmental covenant whenever environmental remediation project results in less than unrestricted land use or uses an engineered structure or feature that requires monitoring, maintenance or operation to function or that will not function as intended if disturbed.	Applicable	

TABLE

LOCATION-SPECIFIC ARARs

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable or Relevant and Appropriate	Comments
FEDERAL				
National Historic Preservation Act	16 USC § 470 et seq. A portion of 40 CFR § 6.301 (b), 30 CFR Part 63, Part 65, Part 800	Regulates impacts to historic places and structures.	Applicable	Applicable if historic places and structures are impacted by response actions
The Historic and Archaeological Data Preservation Act of 1974	16 USC 469 40 CFR § 6.301(c)	Protects sites with archeological significance.	Applicable	Applicable if sites of archeological significance are impacted by response actions
Historic Sites Act of 1935, Executive Order 11593	16 USC §§ 461 et.seq. 40 CFR § 6.301(a)	Regulates designation and protection of historic places.	Applicable	Applicable if designated historic places are impacted by response actions
The Archaeological Resources Protection Act of 1979	16 USC §§ 470aa-47011	Regulates removal of archeological resources from public or tribal lands.	Applicable	Applicable if archeological resources exist on public or tribal lands affected by the response action
Executive Order No. 11990 Protection of Wetlands	40 CFR § 6.302(a) and Appendix A	Minimizes impacts to wetlands.	Applicable	Applicable if wetlands are impacted by response actions
Executive Order No. 11988 Floodplain Management	40 CFR § 6.302 and Appendix A	Regulates construction in floodplains.	Applicable	Applicable if construction in floodplains will occur during response actions
Wild and Scenic Rivers Act	16 USC §§ 1271-1287 40 CFR § 6.302(e) 36 CFR Part 297	Establishes requirements to protect wild, scenic, or recreational rivers.	No	No regulated rivers impacted
Wilderness Act	16 USC 1311, 16 USC 668 50 CFR 53, 50 CFR 27	Limits activities within areas designated as wilderness or National Wildlife Refuge.	No	Area not a designated wilderness
Fish and Wildlife Coordination Act	16 USC § 661 et seq. 40 CFR § 6.302(g)	Requires coordination with Federal and State agencies to provide protection of fish and wildlife.	Applicable	
Endangered Species Act	16 USC §§ 1531-1543 50 CFR Parts 17, 402 40 CFR § 6.302(b)	Regulates the protection of threatened or endangered species.	Applicable	Only if threatened and endangered species or their habitats are identified
Section 404, Clean Water Act	33 USC 1251 et.seq. 33 CFR Part 330	Regulates discharge of dredge or fill materials into waters of the United States	Applicable	

TABLE

LOCATION-SPECIFIC ARARs

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable or Relevant and Appropriate	Comments
FEDERAL				
Migratory Bird Treaty Act	16 USC § 703-12	The act contains a requirement for agencies to examine proposed actions by the government relative to habitat impacts and impacts to individual organisms.	Applicable	Applicable if migratory birds or their habitats are impacted by the response action.
Executive Order No. 12962 Recreational Fisheries	16 USC § 742a-d and e-j; 16 USC § 661-666c; 42 USC § 4321; and 16USC § 1801-1882	The order contains a requirement that Federal agencies, to the extent permitted by law and where practicable and in cooperation with State and Tribes, improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities.	Applicable	
STATE				
Historic Places Register	CRS §§ 24-80.1-101 to 108	The State historic preservation officer reviews potential impacts to historic places and structures.	Applicable	Applicable if historic places and structures are impacted by response actions.
Colorado Natural Areas	Colorado Revised Statutes, Title 33 Article 33, Section 104	Maintains a list of plant species of "special concern." Recommends coordination among Division of Parks and Outdoor Recreation.	Applicable	Only if appropriate plant species are present
Colorado Species of Special Concern and Species of Undetermined Status	Colorado Division of Wildlife Administrative Directive E-1, 1985, modified	Protects species listed on the Colorado Division of Wildlife generated list.	Applicable	Only if listed wildlife species are present
Wildlife Commission Regulations	2 CCR 405-0	Establishes specific requirements for protection of wildlife.	Applicable	
Non-game, Endangered, or Threatened Species Act	CRS §§ 33-2-101 to 108	Standards for regulation of non-game wildlife and threatened and endangered species.	Applicable	Only if appropriate species are present
Colorado Historical Prehistoric and Archaeological Resources Act	CRS 24-80-401 to 410, 1301 to 1305.	Regulates prehistoric and archaeological resources on State lands	Relevant and Appropriate	If actions affect State lands.