



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8**

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Ref: 8EPR-ER

ACTION MEMORANDUM

SUBJECT: Approval and Funding for a Removal Action at the Red and Bonita Mine Discharge Relocation Site, Bonita Peak Mining District Superfund Site, San Juan County, Colorado

FROM: Joe Payne
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TO: Ben Bielenberg, Acting Director
Superfund and Emergency Management Division

Site ID# A8M5

I. PURPOSE

The purpose of this Action Memorandum is to request and document approval of the removal action described herein for the Red & Bonita Mine located within the Bonita Peak Mining District Superfund Site (BPMD) in San Juan County, Colorado. This time-critical removal action involves the reorientation of mine drainage conveyance lines to further assist operational performance of a removal action taken before the BPMD National

Priorities Listing (NPL) and ensure long term efficacy of the solution. The mine drainage will be diverted away from a sensitive ecological area. Conditions existing at the Site present a threat to public health or welfare or the environment and meet the criteria for initiating a removal action under 40 CFR 300.415(b)(2) of the National Contingency Plan (NCP).

This removal action involves no nationally significant or precedent-setting issues. This time-critical removal action will not establish any precedent for how future response actions will be taken and will not commit the US Environmental Protection Agency (EPA) to a course of action that could have a significant impact on future responses or resources.

II. SITE CONDITIONS AND BACKGROUND

| | |
|--------------------------------------|--|
| Site Name: | Red & Bonita Mine Discharge Relocation |
| Superfund Site ID (SSID): | A8M5 |
| Operable Unit (OU1) | 01 |
| NRC Case Number: | |
| CERCLIS Number: | CON000802497 |
| Site Location: | San Juan County, Colorado |
| Lat/Long: | 37.895870, -107.644483 |
| Potentially Responsible Party (PRP): | |
| NPL Status: | Listed on the NPL, September 2016 |
| Removal Start Date: | July 2023 |

A. Site Description

1. Removal Site Evaluation

The Red and Bonita Mine is located within the Cement Creek watershed, which is a component of the upper Animas River watershed in San Juan County, Colorado. These watersheds within the volcanic terrain of the San Juan Mountains were the focus of both large- and small-scale mining operations that flourished between 1871 and 1991. Historic mapping of the Red and Bonita Mine indicates that mining operations began prior to 1899 and lasted for only a short period.

The Animas River and many of its tributaries, including Cement Creek, carry high concentrations of hazardous substances (heavy metals) from both acid rock/mine drainage at mine sites (AMD) and from natural sources not impacted by mining (ARD). Water quality studies have indicated that the Red and Bonita Mine is one of the major sources of metals, especially zinc, to the Animas River near Silverton. The Environmental Protection Agency (EPA), Bureau of Land Management (BLM) and United States Geological Survey (USGS) have undertaken activities to characterize the nature and extent of contamination from mining-related source areas contributing to metals loading in the Animas River. These actions are intended to contribute to the information needed to identify

potential remedies to reduce or prevent ongoing releases of hazardous substances from mine sites within the Site.

A 2012 USGS evaluation and more recent EPA sampling for water quality data indicates that during low flow conditions, mine adit discharges to Cement Creek contribute a large percentage of the metals loading to the Animas River, as measured at a sampling location below Silverton (known as A72). Data collected each Fall from 2015 through 2021 showed that the Red and Bonita Mine discharge accounted for an estimated 19 percent of the zinc load at the sampling location in the Animas below Silverton. The relative contribution from individual mines varies seasonally, depending on flow conditions.

In September and October 2011, the EPA removed a blockage in the Red and Bonita Mine opening and constructed a temporary portal for accessing the mine. The mine adit is approximately five feet wide by seven feet high and extends underground for several hundred feet in multiple directions. Approximately 2,000 feet of workings were investigated before collapsed ground within the tunnels prevented further assessment. However, based on historic information and the estimated waste dump volumes, it is estimated that there are only approximately 3,500 feet of underground workings and that the adit does not physically connect to other mines. In addition, there is no mapped surface opening to the mine, and none were found during Site investigations in September 2014 or previously.

An investigation inside the mine workings in 2013 revealed that the two primary sources of water include the main cross-cut flow and flow from a drift at 275 feet. Suitable rock for a potential bulkhead construction was identified at approximately 265 feet in from the portal, and downstream of the two sources of flow. The source of water flow within the mine could not be isolated, and no physical connections to other mine workings were identified.

Following additional investigation and design in 2014, a concrete bulkhead with a flow control valve was constructed in 2015. Closing the flow control valve in the bulkhead floods the interior workings. Conceptually this may reduce the generation of acidic metal laden water (AMD) by reducing the oxygen contact with pyrite containing mineralized zones in the underground workings and surrounding rock. Additional testing by the EPA Remedial Program is needed to determine if flooding the underground workings will benefit water quality or if it would instead redirect contaminated water to other areas. Currently, the AMD discharge flows into the iron fen downgradient from the Red and Bonita mine. The iron fen is a sensitive wetland ecosystem that is fed by groundwater and requires specific pH levels. The flow of AMD onto the surface of the fen threatens to both physically and chemically change the iron fen by adding heavy metals solids that can smother the sensitive vegetation.

2. Physical Location

The Red and Bonita Mine is in San Juan County, Colorado. The portal is approximately seven miles north of the Town of Silverton, Colorado, at 10,893 feet above mean sea level (AMSL) at 37 degrees 53'49.95"N and 107 degrees 38'38.70"W. Road access is via County Road (CR) 110 from Silverton to CR53 at the abandoned town of Gladstone. CR53 continues northward up the Cement Creek valley to the mine site, approximately 0.5 mile north of Gladstone. There are 650 year-round residents in Silverton, although the town sees an increase during the summer months for recreational activities such as off-roading, fishing, mountain biking, and hiking.

3. Site Characteristics

The Red and Bonita Mine consists of approximately 1.25 acres of waste rock and suspected tailings material and includes an estimated 3,500 feet of underground workings. The adit, which drains throughout the year with some seasonal fluctuation, discharges to Cement Creek after crossing through an iron fen. An iron fen is a rare type of wetland fed by groundwater that supports a unique type of ecosystem capable of thriving in its acidic water content. The current drainage enters directly into the iron fen as shown in photo 1 of attachment 2 of this document. Cement Creek then drains into the Animas River.

The Site lies east of Cement Creek on a west-facing mountainside slope with an average grade of 44 percent. The mine is accessible during non-snow months of the year, typically late June through early October. The mining claims associated with this mine are on steep terrain, at approximately 10,800 feet, limiting conditions for operation.

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

The original removal action taken in 2015 consisted of the installation of an engineered flow-through bulkhead to control acid mine drainage from the Red and Bonita mine. The acid mine drainage contains high levels of several metals including aluminum, cadmium, iron, lead, manganese, and zinc. This drainage from the Red and Bonita adit predates the 2015 removal action and is being addressed now as an operational improvement.

While the bulkhead undergoes further testing and study, the current drainage physically and chemically affects the iron fen adjacent to the adit and requires adjustment. Moving the drainage will also mean moving the drainage flume. Additionally, there is a well casing above the mine portal that is no longer of service and presents an operational safety hazard to workers entering the portal. The EPA Region 8 Remedial Team has determined that these adjustments will improve the operational efficacy of the bulkhead and water conveyance system.

5. NPL Status

The Red and Bonita Mine is within the Bonita Peak Mining District Superfund Site, which was listed on the National Priorities List on September 9, 2016.

6. Maps, Pictures, Other Geographic Representations

A map of the Site is available in Attachment 1. Relevant Site photos are available in Attachment 2 of this document and in the administrative record.

B. Other Actions to Date

1. Previous Actions

In 2015, the EPA Region 8 Removal Program installed a bulkhead with a flow control valve and piping in the mine with the capability to flood the inner workings as described above in Section A.1. The EPA Remedial Program conducted a treatability study in 2020 and flooded the mine workings by closing the bulkhead valve for approximately 4 months. Additional study is needed to determine if closing the bulkhead permanently would improve water quality in Cement Creek or if the AMD water will appear as seeps or springs in other locations.

2. Current Actions

There are no current Removal activities taking place at the Red and Bonita Mine. There are on-going Remedial investigations and inspections across Bonita Peaks Mining District Site that do include the Red and Bonita Mine.

C. State and Local Authorities' Role

1. State and Local Actions to date

State and local authorities have provided assistance but are not anticipated to contribute to this removal action.

2. Potential for Continued State/Local Response

While state and local entities continue to play a vital consultation role in this removal action, the EPA is uniquely positioned with the capability to respond with the appropriate resources.

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

Conditions at the Site 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 considered all the factors described in 40 CFR 300.415(b)(2) of the NCP and determined that the following factors were to be addressed at the Site.

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

Discharge of AMD from the Red and Bonita Mine adit directly enters an iron fen. AMD is acidic water with heavy metals and deposits high quantities of metal laden solids. The iron fen is a sensitive ecosystem fed by groundwater that maintains a specific pH level to support its unique flora and fauna. Adding AMD as surface discharge into the fen threatens the fen's delicate ecosystem. The metals in the AMD threaten to alter the iron fen physically and chemically and are smothering the fen vegetation with high levels of metal solids.

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

No other federal or state response mechanism is available to respond to the releases described above.

IV. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed Action Description

The EPA will redirect the discharge from the adit to bypass the iron fen by adjusting the current location of the discharge valve on the conveyance line. Relocating the discharge valve downstream of the fen will also require moving the current flow measurement flume to be in alignment with the proposed new location. Once the flow is downstream of the iron fen, it will be directed into an existing earthen channel that then feeds into Cement Creek via approximately 100 feet of new conveyance line and approximately 60 feet of scouring, as portrayed in attachment 1 of this document.

The remedial team has also identified that the previously installed well casing above the mine portal is no longer of service and presents a fall hazard. The well casing will be removed as part of this action. This hazard is documented in photo 2 of attachment 2.

2. Contribution to Remedial Performance

This removal action has been requested by the EPA Remedial program to further remedial goals at the Site.

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

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

4. Applicable or Relevant and Appropriate Requirements (ARARs)

This Action Memorandum addresses the proposed time-critical removal action at the Red and Bonita Mine on the Bonita Peak Site. Removal actions conducted under CERCLA are required, to the extent practicable considering the exigencies of the situation, to attain ARARs. In determining whether compliance with an ARAR is practicable, the lead agency may consider appropriate factors, including the urgency of the situation and the scope of the removal action to be conducted. A table containing potential Site-specific ARARs is provided as Attachment 3 to this Action Memorandum.

5. Project Schedule

This removal action is proposed to start in Summer of 2023. It is anticipated that on Site activities will take approximately one week. Completion is expected by December 31, 2023.

B. Estimated Costs*

| | Estimated Costs |
|--------------------------------------|------------------------|
| ERRS contractor | \$ 65,000 |
| START contractor | \$50,000 |
| SUBTOTAL | \$ 115,000 |
| Contingency costs (20% of subtotal) | \$ 23,000 |
| Total Removal Project Ceiling | \$ 138,000 |

*EPA direct and indirect costs, although cost recoverable, do not count toward the Removal Ceiling for this removal action. Liable parties may be held financially responsible for costs incurred by the EPA as set forth in Section 107 of CERCLA

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

A delay in action or no action at this Site would increase the actual or potential threats to the public health and/or the environment.

VI. OUTSTANDING POLICY ISSUES

None

VII. ENFORCEMENT

A separate Enforcement Addendum has been prepared providing a confidential summary of current and potential future enforcement activities.

VIII. RECOMMENDATIONS

This decision document represents the selected removal action for the Red & Bonita Mine within the Bonita Peak Mining District Site in San Juan 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 removal action.

Conditions at the Site meet the NCP section 300.415(b)(2) criteria for a removal action, and I recommend your approval of the proposed removal action. The total project ceiling, if approved, will be \$138,000; this amount will be funded from the BPMD Special Account.

APPROVE

Ben Bielenberg
Acting Director
Superfund and Emergency Management Division

Date

DISAPPROVE

Ben Bielenberg
Acting Director
Superfund and Emergency Management Division

Date

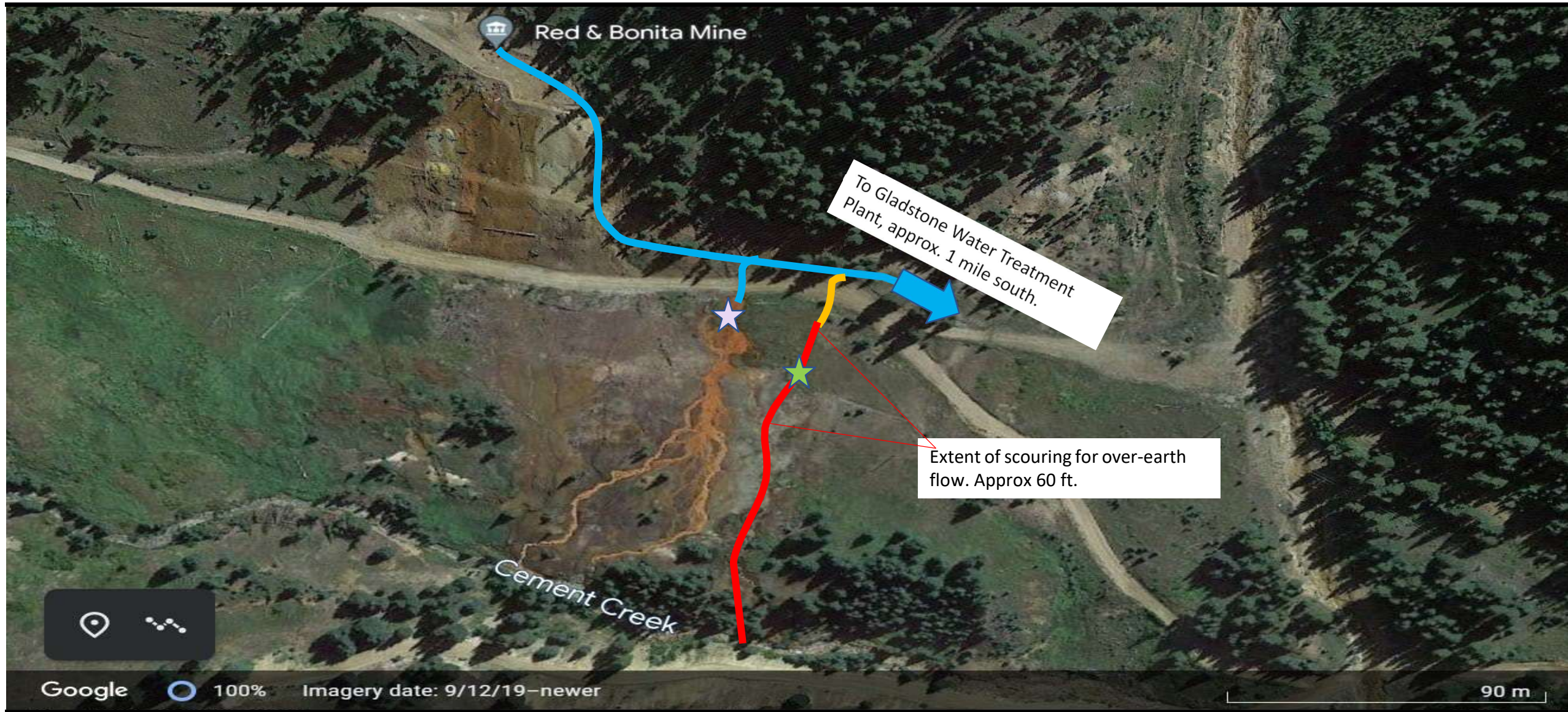
Attachments:

Attachment 1: Site Map

Attachment 2: Site Photos






Attachment 3: Applicable or Relevant and Appropriate Requirements (ARARs)

Attachment 1:
Site Map



LEGEND:

OSC Payne, April 2023

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|---|--------------------------|--|------------------------------|---|---------------------------|---|------------------------|
|  | Existing Conveyance Line |  | Proposed New Conveyance Line |  | Proposed New Channel Flow |  | Current Flume Location |
| | | | | | |  | Proposed New Flume |

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Attachment 2:

Photos



Photo 1: View from the road showing the iron fen adjacent to the mine adit. Also visible is the mine discharge entering the fen through the current flume location.



Photo 2: The mine portal with well casing shown circled in the center of the photo. The well is no longer in use and the casing is held in place by rope as indicated by the arrow.

Attachment 3:

ARARs

**Applicable or Relevant and Appropriate
Requirements (ARARs)
Red and Bonita Mine Discharge
Relocation Site**

| Location | Requirements | Prerequisite | Citation(s) |
|---|---|---|--|
| State Location-Specific ARARs | | | |
| Relevant wildlife habitat | Prohibits willfully damaging or destroying any wildlife den or nest, or their eggs, or harassing any wildlife. "Harass" means to unlawfully endanger, worry, impede, annoy, pursue, disturb, molest, rally, concentrate, harry, chase, drive, herd, or torment wildlife. See C.R.S. § 33-1-102(24) (Definitions) | Performing response activities in relevant wildlife habitat. | Colorado Wildlife Enforcement and Penalties Act, Colorado Revised Statutes (CRS) § 33-6-128 |
| Relevant wildlife habitat | Prohibits harassment, taking or possession of nongame species and subspecies, including threatened or endangered wildlife, with limited exceptions. The designations of species as endangered, threatened, or a nongame species, are made pursuant to 2 C.C.R. 406-10:1002-4. This regulation incorporates definitions of terms found in the Colorado Wildlife Enforcement and Penalties Act, C.R.S. § 33-1-102. | Performing response activities in relevant wildlife habitat. | Colorado Non-game, Endangered, or Threatened Species Act, CRS §§ 33-2-104(3) and Colorado Wildlife Commission Regulations, 2 Code of Colorado Regulations (CCR) 406-10:1002-1004 4(Protected Species) |
| Area where waste left in place above unrestricted use standards or where engineered features are incorporated into the remedy | Requires environmental covenants (ECs) or notice of environmental use restrictions (RNs) whenever residual contamination not safe for all uses is left in place or an engineered feature or structure that requires monitoring, maintenance, or operation is included in the remedy. ¹ | Performing response activities in locations leaving waste in place above standards for unrestricted use or incorporating engineered features or structures. | Colorado Environmental Covenants Statute CRS § 25-15-317 et seq. |
| Excavating mine waste; constructing drainage channels. | Establishes requirements and procedures for land disposal of solid wastes. Pursuant to the Solid Wastes Disposal Sites and Facilities Act, C.R.S. § 30-20-102(4), mining operations including reclamation activities with approved reclamation plans under a Colorado Mined Land Reclamation Board (MLRB) permit may dispose of solid wastes generated by such operations within the permitted area without obtaining a Certificate of Designation. CDPHE interprets this provision to allow CERCLA response actions performed consistently with the MLRB regulation 2 CCR 407-1 Rule 3 (Reclamation Performance Standards) to be compliant with Colorado's regulation pertaining to solid waste disposal. | Disposing solid waste. | Colorado Solid Waste Disposal Sites and Facilities Regulations, 6 CCR 1007-2, pursuant to C.R.S. §§ 30-20-100.5, <i>et seq.</i> |
| Excavating mine waste; constructing drainage channels. | The MLRB Regulations require reclamation of permitted mined lands, defined as "employment of procedures reasonably designed to minimize as much as practicable the disruption from mining operations and to provide for the establishment of plant cover, stabilization of soil, the protection of water resources, or other measures appropriate to the subsequent beneficial use of such affected lands." Reclamation must be conducted in accordance with the performance standards in Rule 3 of the Regulations. Substantive requirements are relevant and appropriate to mine reclamation activities including constructing the lined drainage tunnel, consolidating waste rock and other mine related materials and vegetating the engineered cover. | Reclaiming mined lands. | Colorado Mined Land Reclamation Board Regulations ("MLRB Regulations"), Reclamation Performance Standards, 2 C.C.R. § 407-1, Rule 1.1 (definitions) and Rule 3 (Reclamation Performance Standards), pursuant to the Co. Mined Land Reclamation Act, C.R.S. § 34-32-101, <i>et seq.</i> |
| Excavating mine waste; constructing drainage channels. | Acid forming or toxic producing mined materials must be handled and disposed in a manner that will control unsightliness and protect the surface and groundwater drainage system from pollution. | Reclaiming mined lands. | MLRB Regulations, Rule 3.1.5(5), (10) |

**Applicable or Relevant and Appropriate
Requirements (ARARs)
Red and Bonita Mine Discharge
Relocation Site**

| Excavating mine waste; constructing drainage channels. | Reclamation activities must minimize disturbances to the prevailing hydrologic balance of the mined land and surrounding area by complying with all laws pertaining to water rights, water quality and dredge and fill activities. Minimizing measures also include removing temporary or large siltation structures from drainageways after stabilization and rehabilitation. | Reclaiming mined lands. | MLRB Regulations Rule 3.1.6 (3) |
|---|---|---|--|
| Excavating mine waste; constructing drainage channels. | Any grading shall be done in a manner to control erosion and siltation and protect from slides and other damage. High walls shall be stabilized or eliminated. Grading shall create a final topography appropriate to the future land use. Slopes and slope combinations shall be compatible with the configuration of surrounding conditions and future land use. | Reclaiming mined lands. | MLRB Regulations Rule 3.1.5(1), (3) |
| Conducting activities generating dust. | Establishes regulations concerning fugitive emissions from construction activities, storage and stockpiling activities, haul trucks, and tailings ponds | Conducting activities generating dust. | Colorado Fugitive Dust Control Plan/Opacity, Regulation No. 1, 5 CCR 1001-3(III)(D)(2)(b),(h) (Particulate Matter – Construction Activities), pursuant to Colorado Air Pollution Prevention and Control Act, CRS § 25-7-101 <i>et seq.</i> |
| Location | Requirements | Prerequisite | Citation(s) |
| Federal Location-Specific ARARs | | | |
| Red and Bonita Mine Discharge Relocation Site | <p>This statute and implementing regulations require federal agencies to take into account the effect of this response action upon any district, site, building, structure, or object that is included in or eligible for the National Register of Historic Places (generally, 50 years old or older). A cultural resource survey must be conducted to determine if cultural resources are present. If cultural resources on or eligible for the national register are present, a technical assessment must be conducted to make a determination of no effect, no adverse effect, or determination of adverse effect. If adverse effects are identified, the project planning and design must avoid, minimize, or mitigate the effects.</p> <ul style="list-style-type: none"> - A Class III Re-Evaluation of the Red and Bonita Mine and Mill site was completed in 2015 by a qualified archaeologist. The site lacks integrity due to extensive bulldozing in the 1950s, 1990s, and 2010-11 as well as general deterioration since it's time of significance. Only one set of features identified in the 2015 report would be considered eligible for the National Register of Historic Places and it is located outside of the area of potential effect. The response actions described in this memo will have no adverse impact on cultural resources. | Identification of cultural resources by surveys. | National Historic Preservation Act (NHPA) 16 United States Code (U.S.C.) § 470 and Implementing Regulations 36 Code of Federal Regulations (CFR) §§ 800.4, 800.5, 800.6, and 800.10(a) |
| Red and Bonita Mine Discharge Relocation Site | This statute and implementing regulations provide that federal activities not jeopardize the continued existence of any threatened or endangered species. 16 U.S.C. 1536(a) of the Endangered Species Act (ESA) requires consultation with the U.S. Fish and Wildlife Service to identify the possible presence of protected species and mitigate potential impacts on such species. Substantive compliance with the ESA means that the lead agency must identify whether a threatened or endangered species, or its critical habitat, will be affected by a proposed response action. If so, the agency must avoid the action or take appropriate mitigation measures so that the action does not affect the species or its critical habitat. If, at any point, the conclusion is reached that endangered species are not present or will not be affected, no further action is required. | Actions that may negatively impact the species and their habitat. | Endangered Species Act 16 U.S.C. § 1536, and Implementing Regulations 50 CFR §§ 17.21, 17.31, 17.61, 17.71, 17.82 |

