



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 8

DENVER, CO 80202-1129

1595 Wynkoop Street

Phone 800-227-8917

<http://www.epa.gov/region08>

Ref: 8EPR-ER

ACTION MEMORANDUM

SUBJECT: Request for Approval of a Non-Time-Critical Removal Action at the Barker Hughesville Mining District NPL Site – Block P Mine Complex

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

A handwritten signature in blue ink, appearing to read "Steven Way", is written over the "FROM" line.

THROUGH: Curtis Kimbel, Chief
Emergency Response Unit

A handwritten signature in blue ink, appearing to read "C. Kimbel", is written over the "THROUGH" line.

TO: David A. Ostrander, Director
Preparedness, Assessment & Response Program

Site ID#:

035N

~~08RN~~ - OU 01

SW

Category of Removal:

Non-Time Critical, PRP-Lead

I. PURPOSE

The purpose of this Action Memorandum is to request and document approval of the proposed PRP-lead removal action described herein for the Block P Mine Complex of Operable Unit 01 (OU1) at the Barker Hughesville Mine District NPL Site, located near the town of Monarch, Cascade and Judith Basin County(s), Montana. The actions discussed herein are consistent with anticipated and/or potential future Remedial actions at the Site. The extent of the construction required to complete these actions and the very short annual construction season at the Site will necessitate the removal taking more than twelve (12) months to complete.

Ongoing releases of hazardous substances from the Block P Mine Complex waste dumps and mine workings into area drainages continue to cause water quality standards, for both aquatic life and drinking water, to be exceeded in Galena Creek and associated groundwater. Accordingly, conditions at the Site present an imminent and substantial endangerment to human health or the environment and meet the criteria for initiating a Non-Time Critical Removal Action (n-TCRA) under 40 C.F.R. Section 300.415(b)(2) of the National Contingency Plan (NCP).

II. SITE CONDITIONS AND BACKGROUND

A. Site Description

The Barker-Hughesville Mining District NPL Site (Site) is within Judith Basin County and Cascade County, approximately 40 miles southeast of Great Falls, Montana. Actions discussed in this Memorandum include related activities at the Block P mine, the Wright/Edwards mines, the Belt Patent mine, and the Grey Eagle mine (the 'Block P Mine complex').

Mining activities in the project area date back to 1879, when the first discovery of silver and lead ores was made. By 1883, near-surface ore deposits were depleted and underground workings were being expanded. Mining continued into the mid-1900s at the Block P Mine complex. (Data are summarized in the Engineering Evaluation/Cost Analysis (EE/CA) for the Block P Mine Complex, Barr Engineering; March 2010.)

1. Removal Site Evaluation

Upper Galena Creek Drainage: The Upper Galena Creek drainage is located in the center of the Site, downstream of Green Creek and Daisy Creek. It encompasses about 1,178 acres and includes Galena Creek from the Block P Mine through the town of Barker. The Upper Galena Creek drainage also includes Silver Creek and Bend Gulch Creek. There are a total of 19 mine sites located within this drainage, the largest of which is the Block P Mine. Water quality in Galena Creek is poor throughout the drainage due to degrading influences from the Block P Mine Complex, upstream tributaries with contaminated with mine waste, numerous adit discharges to the creek, and recharge from impacted groundwater. Creek water is often rust-colored, the pH is seasonally low, and the stream bed is iron stained.

Lower Galena Creek Drainage: The Lower Galena Creek drainage is located downstream of the town of Barker and includes Galena Creek through its confluence with Dry Fork Belt Creek. This drainage encompasses 549 acres and includes three mine sites including the Block P Tailings, Silver Bell, and SW SE Section 7 mine.

2. Physical Location

The Site is located in west-central Montana, in the Little Belt Mountains. The portion of the Site being addressed by this action is approximately ten miles east of the town of Monarch, MT, in the Galena Creek watershed. Site elevations range from approximately 5,500 ft MSL to more than 6,000 ft MSL. (Figure 1, Attachment 1 – Site Map)

3. Site Characteristics

The estimated waste rock volume for the five mines of the Block P Mine complex is approximately 260,000 cubic yards. These waste rock dumps are located within the channels of Galena Creek and a tributary (an intermittent stream) to Silver Creek. Recent samples have shown lead concentrations in the waste rock dumps range from approximately 4,500 milligrams per kilogram (mg/kg) to 21,000 mg/kg. Zinc is also highly elevated in several waste rock samples with concentrations ranging up to approximately 3,000 mg/kg. Water from seasonal snow melt run-off and precipitation events percolate through the mine wastes, producing acid mine drainage from the dumps, releasing hazardous substances into area drainages and associated ground water, and eroding additional wastes into surface water.

In addition, contaminated water accumulated in underground mine workings flow from adits directly into surface drainages. Flow volumes from the Block P mine adit (discharge water at approximately a pH of 3.5 standard units) vary widely during the year, ranging as high as approximately 300 gallons per minute. Also, alluvial groundwater levels rise seasonally, saturating portions of the waste dumps which further contribute to hazardous substance releases into surface water.

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

Analyses of samples collected at the Site indicate presence of high concentrations of heavy metals, including zinc, cadmium, and lead, in waste, sediment and mine drainage waters. For example, flows from the Block P Mine adit contain zinc at concentrations ranging from 27,000 to 30,000 micrograms per liter (ug/L). In addition, these same hazardous substances are found in several miles of surface water at the Site. 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 imminent and substantial threat to public health or the environment.

Aquatic life in Galena Creek below the Block P Mine complex is practically non-existent. Impacts to aquatic life are evident in the Dry Fork of Belt Creek below the confluence with Galena Creek due to elevated concentrations of heavy metals and low pH water being transported from the mines. Galena Creek surface water sampling shows that concentrations of heavy metals increase 10 to 20 times immediately below the Block P Mine from those samples collected immediately above the Block P mine. These concentrations are more than 10 times above the surface water quality standards for some metals.

5. NPL Status

The Barker Hughesville Mine District Site has been listed on the NPL.

B. Other Actions to Date

1. Previous Actions

There have been no previous CERCLA removal actions performed at Block P Mine complex

Initial investigations at the Site were performed by the EPA Region 8 Superfund Remedial program. Subsequent Site removal evaluations continued pursuant to terms of an Administrative Order on Consent (AOC) with the PRP for development of an EE/CA.

A 2004 removal action at the Block P Tailings Impoundment was performed by the PRP pursuant to terms of an administrative order from the USDA-FS. . Accordingly, the Block P Tailings impoundments were consolidated into the upper tailings pond and covered with a geo-membrane and vegetated soil cap.

Water quality in Lower Galena Creek remains poor due primarily to upstream discharges to Upper Galena Creek, within the NPL Site.

2. Current Actions

In addition to the removal action described herein, EPA is conducting a remedial action at the Site, as discussed elsewhere in this document.

C. Federal, State, and Local Authorities' Roles

1. Federal, State and Local Actions to Date

The State of Montana has directly assisted with site assessment activities. They have participated in the assessment and planning associated with the removal proposed in this document.

2. Potential for Continued State/Local Response

The State is anticipating involvement in future activities in the area during subsequent remedial actions. The State is expected to remain involved in the removal planning and oversight, and supports this proposed removal.

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

The levels of surface contamination and the unsecured nature of ongoing Site releases support the decision to develop an EE/CA and perform a removal at the Site. Conditions existing at the Site meet the criteria for initiating a Removal Action under 40 CFR, §300.415 (b) (2) of the National Contingency Plan (NCP).

The following factors from § 300.415 (b) (2) of the NCP form the basis for EPA's determination of the threat present and the appropriate action to be taken:

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

Flora and fauna in the surrounding aquatic environment are being exposed to and adversely affected by heavy metals released from the Site through direct contact (primarily ingestion) with waste rock containing hazardous substances, and/or consumption of water impacted by mine discharge waters. There is a potential for direct human and animal access to areas of the Site where hazardous substances exist at high concentrations on the surface, and where offsite migration of hazardous substances into surface waters, channel bottoms, wetlands, and seasonal private recreation properties, creates additional threats of exposure;

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

Risk to aquatic life from heavy metals in surface water is elevated for Galena Creek, Dry Fork Belt Creek, and their tributaries where there exists multiple metals which have a high frequency of hazard quotients (HQ) values above 1, based on both the chronic and acute toxicity benchmarks (HQ values were often into the 10-100 range, indicating a significant threat to aquatic life). The highest risks appear to be due to cadmium, copper, iron, lead, and zinc. The highest HQ are usually in Galena Creek, Daisy Creek, and Silver Creek. Similar levels of risks are found for the sediments present in the channel bottoms of these water ways. (Ref: Screening-Level Ecological Risk Assessment (SLERA) for the Barker Hughesville Mining District Superfund Site, April 25, 2007)

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

As evidenced by the sampling analyses and Site evaluation which have been completed thus far, there are several findings that demonstrate the release of hazardous substances, pollutants, or contaminants into the environment. Metals (especially lead and zinc) have been found in the soil and surface water sediments and there is obvious evidence of erosion of mineralized waste rock into surface water and onto surrounding areas. Recent samples have shown lead concentrations found in the waste rock dumps ranges from approximately 4,500 mg/kg to 21,000 mg/kg. Zinc is also highly elevated in several waste rock samples ranging up to approximately 3,000 mg/kg. Surface water quality standards are exceeded for these metals and others within this area of the Site. Substantial increases in dissolved metals concentrations are observed for copper, zinc, and lead below the Block P mines.

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

Annual snow melt run-off conditions contribute significantly to the continuing release of the hazardous substances into adjacent surface water, which has led to heavy sediment contamination and low pH values in the water.

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

EPA is the lead agency for overseeing PRP Removal actions at this NPL Site, as discussed in this Action Memorandum.

A. Threats to the Public Health or Welfare

The following are descriptions of the threats posed to the human population by the specific contaminants found in the material in the various Site piles. However, the frequency of exposure is generally expected to be low.

Lead

There is a potential for humans to come into direct contact with material in the various piles. Lead concentrations are elevated in numerous waste rock samples. Lead is classified as a B2 carcinogen by EPA, and lead compounds are known to cause acute health effects. (The classification as a carcinogen is the result of animal studies determining that these compounds are probable human carcinogens). Lead can enter the body via ingestion and inhalation. Children appear to be the segment of the population at greatest risk from toxic effects of lead. Initially, lead travels in the blood to the soft tissues (heart, liver, kidney, brain, etc.). Then it gradually redistributes to the bones and teeth where it tends to remain. Children exposed to high levels of lead have exhibited nerve damage, permanent mental retardation, colic, anemia, brain damage, and death.

B. Threats to the Environment

The threats to the environment, specifically to the aquatic life in Galena Creek and the Dry Fork of Belt Creek have been described previously in this document. The following are descriptions of the threats to the environment posed by the specific contaminants found in the waste and acid mine drainage at the Site.

Zinc

Zinc is found in Galena Creek at levels 10 to 20 times above the surface water quality standard. Zinc produces acute toxicity in freshwater organisms over a range of concentrations below those found on the Site. Acute toxicity is similar for freshwater

fish and invertebrates. In many types of aquatic plants and animals, growth, survival, and reproduction can all be adversely affected by elevated zinc levels.

Cadmium

Cadmium levels in Galena Creek below the Block P mine are at approximately 30 times above surface water quality standards. Laboratory experiments suggest that cadmium may adversely effect fish reproduction in levels present at the Site. Cadmium is highly toxic to wildlife; it is cancer-causing and teratogenic and potentially mutation-causing, with severe sub-lethal and lethal effects at even low environmental concentrations. It bio-accumulates at all trophic levels, accumulating in the livers and kidneys of fish. Crustaceans appear to be more sensitive to cadmium than fish and mollusks. Cadmium can be toxic to plants at lower soil concentrations than other heavy metals and is more readily taken up than other metals.

Copper

Copper concentrations in Galena Creek are found at levels approximately 10 times above the highest (based on water hardness) surface water quality standards. Copper produces acute toxicity in freshwater animals and data is available for species in 41 genera. Data for eight species indicates that acute toxicity also decreases with increases in alkalinity and total organic carbon. Chronic values are available for 15 freshwater species (for Brook Trout, as low as 3.873 ug/l, depending on hardness). Copper concentrations are found above 200 ug/L in Galena Creek. Fish and invertebrate species seem to be about equally sensitive to the chronic toxicity of copper. Copper is highly toxic in aquatic environments, adversely effecting fish, invertebrates and amphibians. Copper will bio-concentrate in many different organs in fish (potential low, however) and mollusks. Copper sulfates and other copper compounds are algacides, with sensitive algae potentially affected by free copper at low ppb concentrations. Toxicity tests have been conducted on copper with a wide range of freshwater plants, and their sensitivities are similar to those of animals.

IV. ENDANGERMENT DETERMINATION

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

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 potential remedial actions currently anticipated for the Site. The amount of construction 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

1. Proposed Action Description

The recommended actions include removing waste rock from its current location on the Block P Mine Complex mines on hillsides (slopes) adjacent to Galena Creek, in and along surface water drainages, and consolidating the waste rock into an engineered repository located on-Site (Figure 2 – Site Layout, Attachment 1). (Currently, Area 2 is the planned location for the on-Site repository as shown in Figure 3 – Proposed Repository Locations, Attachment 1.) The repository will be designed so as to minimize infiltration and run-on and, in turn, prevent migration of hazardous substances from the waste rock. The removal action is expected to contribute to remedial performance, is intended to provide long-term protection, and to be consistent with future actions at the Site.

The major components of the action are listed below and may include other actions consistent with the overall scope of this removal:

- a. Temporarily diverting Galena Creek flow around the construction area;
- b. Clearing out the damaged old wooden structures, metal pipe and other debris on the waste dump(s) and from the channel;
- c. Constructing or improving existing roads between the Site to the repository so as to support haul-truck traffic;
- d. Constructing an engineered repository so as to permanently store Site wastes, to include an earthen and geo-membrane (e.g., HDPE, PVC or equivalent) composite cover;
- e. Removing waste rock and other mine waste (approximately 260,000 cubic yards) from the specified mines, impacted adjacent land and portions of Galena Creek within and near the area adjacent to the Block P Mine Complex;
- f. Constructing an engineered seal in the mine shaft that is connected to the Block P Mine adit so as to prevent draining water from entering the workings from nearby surface and near surface flow;
- g. Reducing water inflow to the Block P mine workings from surface and near surface drainage, where possible; and
- h. Restoring areas impacted during the removal, including re-constructing Galena Creek and amending and revegetating the waste dump areas.

2. Contribution to Remedial Performance

This Site is a part of the Barker Hughesville Mine District NPL Site. Removal actions described herein are intended to provide long-term Site protection, and are consistent with future remedial actions contemplated for other portions of the

NPL Site. 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). Such PRSC include actions necessary to ensure the effectiveness and integrity of this action, including but not limited to those steps taken to minimize inflow to or outflow from the Block P mine shaft adit, securing the repository cap so as to ensure long-term cap integrity, and re-vegetating, re-contouring, or restoring areas disturbed during the removal.

3. Description of Alternative Technologies

At this time, no alternative technologies have been identified as appropriate for the removal actions discussed herein. Alternative technologies for remedial actions anticipated elsewhere on the Site are continually being investigated and, as appropriate, will be selected during Remedial design.

Doe Run Resources Corporation prepared an Engineering Evaluation and Cost Analysis (EE/CA) that EPA submitted to the public for comment from March 22 – April 30, 2010.

5. Applicable or Relevant and Appropriate Requirements (ARARs)

This Removal Action will attain to the extent practicable, considering the exigencies of the situation, applicable or relevant and appropriate requirements of federal environmental or more stringent state environmental laws. General regulatory conditions that apply to the Site are described below. A list of potential ARARs and detailed analysis is presented in Attachment 2.

The Removal Action as it relates to channel construction/stabilization and waste pile removal within a channel is covered under the auspices of the nationwide permit by rule provided for under the Clean Water Act 404 requirements.

RCRA Section 3001(b) (3) (A) (ii), the **Bevill exclusion**, excludes "solid waste from the extraction and beneficiation of ores and minerals" from regulation as hazardous waste under Subtitle C of RCRA.

6. Project Schedule

This PRP-lead Removal start is planned for August 2010, with the completion anticipated in November 2012

B. Estimated Costs

The estimated PRP Removal cost, as presented in the EE/CA for this action, is approximately \$ 6 million. EPA oversight costs will be incurred, and reimbursed, during PRP implementation of this Removal.

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

Heavy metal contaminants will continue to migrate off-site from the Block P Mine Complex by various leaching and erosion mechanisms and from active mine discharges into Galena Creek, impacting and degrading creek ecosystems. Additionally, contaminants in the creek will be carried downstream into the Dry Fork of Belt Creek, thereby adversely impacting additional ecosystems should action be delayed or not taken.

VIII. ENFORCEMENT

As indicated above, the Doe Run Resources Corporation, a PRP, is expected to perform the proposed Removal Action under the terms of an Administrative Order.

IX. RECOMMENDATION

This decision document represents the selected Removal Action for the Block P Mine Complex waste piles, which is a portion of Operable Unit 01 of the NPL Site, and it is developed in accordance with CERCLA as amended, and not inconsistent with the NCP. This decision is based on the administrative record for the Site.

Conditions at the Site meet the NCP Section 300.415(b) (2) criteria for a Removal, and I recommend your approval of this proposed PRP-lead, Non-Time Critical Removal Action.

Approve: David A. Ostrander
David A. Ostrander
Director
Preparedness, Assessment, and
Response Program

Date: 8/19/2010

Disapprove: _____
David A. Ostrander
Director
Preparedness, Assessment, and
Response Program

Date: _____

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 EPA Region 8 – Montana Operations office in Helena, Montana.

Attachment 1: Figures

Attachment 2: ARARs Analysis

Attachment 1 (Figures)

Figure 1 - Site Location

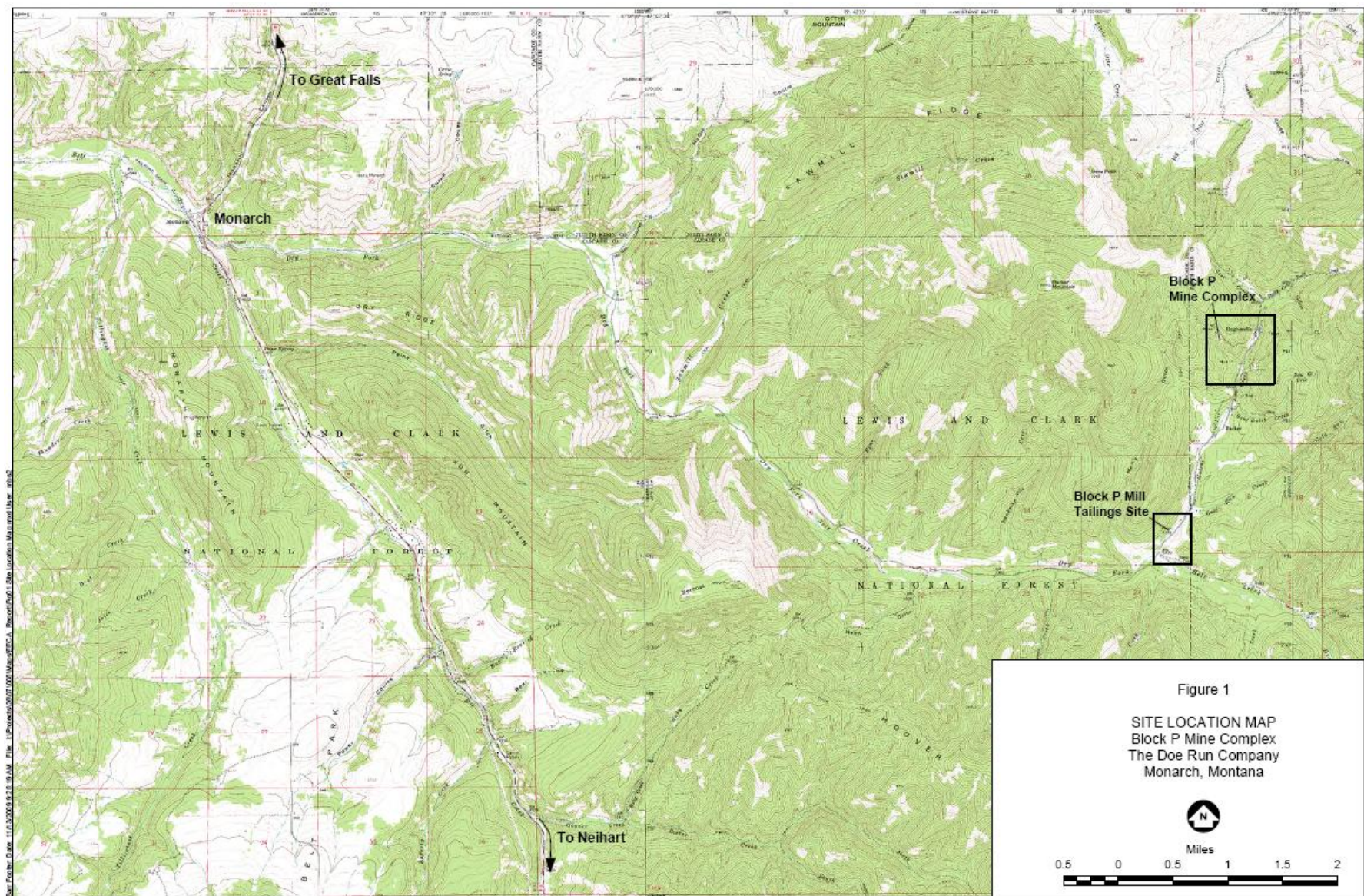
Figure 2 – General Site Layout

Figure 3 - Proposed Repository Locations

Barker Hughesville Mine District NPL Site

Block P Mine Complex

Removal Action





Imagery Source: 2005 NAIP

Approximate Mine
Site Areas

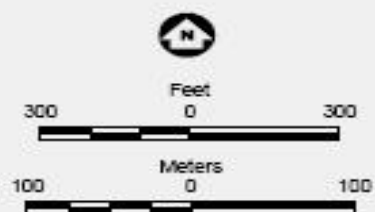
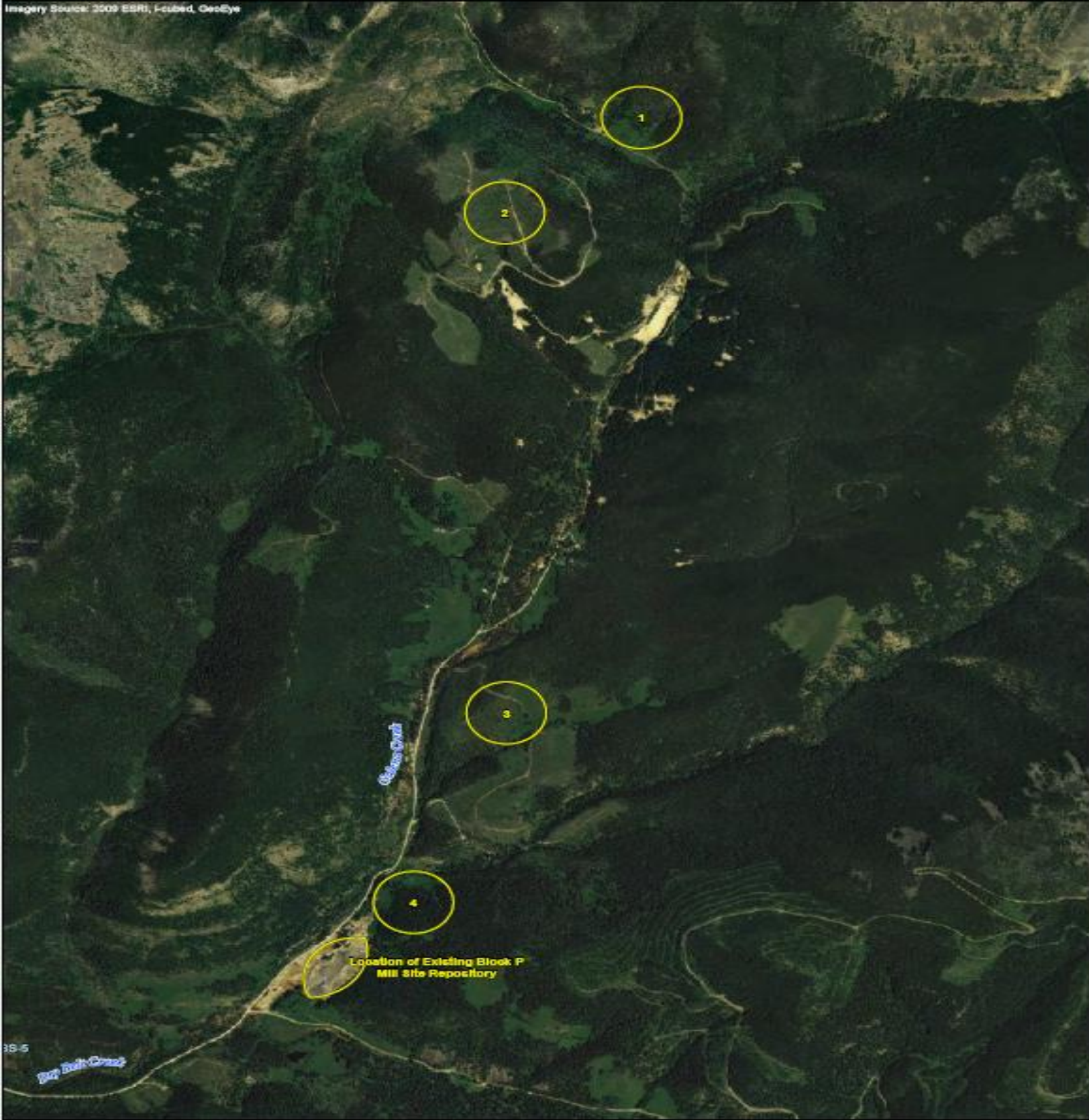


Figure 2
GENERAL SITE LAYOUT
Block P Mine Complex
The Doe Run Company
Monarch, Montana



Potential Repository Location

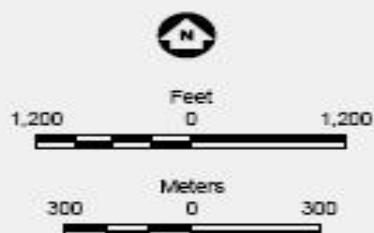


Figure 17
POTENTIAL REPOSITORY
LOCATIONS
Block P Mine Complex
The Doe Run Company
Monarch, Montana

Attachment 2
Applicable or Relevant and Appropriate Requirements
(ARARs) Analysis

Barker Hughesville Mine District NPL Site
Block P Mine Complex
Removal Action

**Table H-1
Contaminant-Specific ARARs
Block P Mine Complex
Monarch, Montana**

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/Relevant and Appropriate?
<i>Federal</i>			
Safe Drinking Water Act	40 USC § 300¹		
National Primary Drinking Water Regulations	40 CFR Part 141	Establishes health-based standards for public water systems (maximum contaminant levels).	Relevant and Appropriate ²
National Secondary Drinking Water Regulations	40 CFR Part 143	Establishes aesthetic standards for public water systems (secondary maximum contaminant levels).	Relevant and Appropriate ^{3 4}
Water Pollution Prevention & Control Act	33 USC §§ 1251-1387⁵		
Water Quality Regulations	40 CFR Part 131	Sets criteria for water quality based on toxicity to aquatic organisms and human health.	Not Applicable , Defer to Montana Regulations ⁶
National Priority Pollutant Discharge Elimination System	40 CFR Part 122	General permits for discharge from construction.	Not Applicable , Defer to Montana Regulations ⁷
Clean Air Act	40 USC § 7409⁸		
National Primary and Secondary Ambient Air Quality Standards	40 CFR Parts 50.6 and 50.12	Air quality levels that protect public health. Specifically, PM-10 and lead airborne concentration limits.	Not Applicable , Defer to Montana Regulations ⁹
Resource Conservation and Recovery Act	42 USC § 6901-6987¹⁰		
Lists of Hazardous Wastes	40 CFR Part 261, Subpart D	Defines those solids wastes which are subject to regulation as hazardous wastes under 40 CFR Parts 262-265 and Parts 124, 270, and 271.	Not applicable based on Bevill Amendment. ¹¹
	40 CFR Part 264	Requirements for proper handling, transport, storage, and disposal of hazardous wastes.	Not applicable based on Bevill Amendment. ¹²

**Table H-1
Contaminant-Specific ARARs
Block P Mine Complex
Monarch, Montana**

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/Relevant and Appropriate?
<i>State of Montana</i>			
Montana Water Quality Act	MCA 75-5-101 et seq.	Laws to prevent, abate, and control the pollution of state waters. It is unlawful to cause pollution of any state waters, to place any wastes in a location where they are likely to cause pollution of any state waters, or to violate any permit provision.	Applicable ¹³
Regulations Establishing Ambient Surface Water Quality Standards	ARM 17.30.623	Provides the water use classification for various streams and imposes specific water quality standards per classification.	Applicable, Outside Scope ¹⁴
	ARM 17.30.637	Requires that the State's surface waters be free from, among other things, substances that will create concentrations or combinations of materials that are harmful to human, animal, plant or aquatic life. No waste may be discharged and no activities may be conducted that can reasonably be expected to violate any of the standards.	Applicable, Outside Scope ¹⁵
Regulations Establishing Waste Treatment Standards	ARM 17.30.635	Imposes waste treatment requirements to restore and maintain the quality of surface water to applicable water use categories.	Applicable, Outside Scope
Nondegradation of Water Quality	ARM 17.30.705-717	Applies nondegradation requirements to any activity which would cause a new or increased source of pollution to state waters and outlines review procedures.	Applicable, Outside Scope ¹⁶
Montana Groundwater Act	MCA 85-2-101 et seq.		
Montana Groundwater Pollution Control System Regulation	ARM 17.30.1006	Classifies groundwater into Classes I through IV and establishes the groundwater quality standards for each groundwater classification	Applicable, Outside Scope ¹⁷

**Table H-1
Contaminant-Specific ARARs
Block P Mine Complex
Monarch, Montana**

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/Relevant and Appropriate?
Montana Groundwater Pollution Control System Regulation (continued)	ARM 17.30.1005	Establishes the applicability of groundwater quality standards and the basis for classification	Applicable, Outside Scope ¹⁸
	ARM 17.30.1011	Requires that any groundwater whose existing quality is higher than the standard for its classification must be maintained at that high quality unless degradation is allowed under the principles established in 75-5-303, MCA, and nondegradation rules ARM 17.30.705 et seq.	Applicable, Outside Scope ¹⁹
Clean Air Act of Montana	MCA 75-2-102		
Air Quality Regulations	ARM 17.8.220	No person shall cause or contribute to concentrations of particulate matter in the ambient air such that the mass of settled particulate matter exceeds the following 30-day average; 10 grams per square meter.	Applicable ²⁰
	ARM 17.8.222	Ambient air lead standard.	Applicable ²¹
	ARM 17.8.223	Ambient air PM-10 standard.	Applicable ²²
	ARM 17.8.304-308	Requires construction and demolition to control emissions of airborne particulate matter.	Applicable ²³

**Table H-1
Contaminant-Specific ARARs
Block P Mine Complex
Monarch, Montana**

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/Relevant and Appropriate?
Air Quality Regulations (continued)	ARM 17.8.604	Lists certain wastes that may not be disposed of by open burning, including oil or petroleum products, RCRA hazardous wastes, chemicals, and treated lumber and timbers.	Applicable
	ARM 17.24.761	Requires a fugitive dust control program be implemented in reclamation operation, and lists specific components of such a program.	Relevant and Appropriate ²⁴

¹ These are enforceable in Montana under the Public Water Supplies, Distribution, and Treatment Act and corresponding regulations, MCA § 75-6-101, et seq., and ARM § 17.38.203.

² The National Primary Drinking Water Regulations (40 CFR Part 141) establish maximum contaminant levels (MCL) for chemicals in drinking water distributed in public water systems. Safe Drinking Water Act MCLs are relevant and appropriate to this removal action because the water in Galena Creek and nearby tributaries is a potential source of drinking water to residents in the area. These regulations also establish maximum contaminant level goals (MCLG) which are also relevant and appropriate for this removal action. MCLGs are health-based goals which are established at levels at which no known or anticipated adverse effects on the health of persons occur and which allow an adequate margin of safety. According to the NCP, MCLGs that are set at levels above zero must be attained by removal actions for ground or surface waters, such as Galena Creek, that are current or potential sources of drinking water. Where the MCLG for a contaminant has been set at a level of zero, the MCL promulgated for that contaminant must be attained by the removal actions.

³ The National Secondary Drinking Water Regulations (40 CFR Part 143) establish MCLs for certain additional constituents, as identified in the table in Footnote 4.

⁴ The MCLs and MCLGs for contaminants of concern at the Block P Mine Complex are:

<u>Contaminant</u>	<u>MCL (mg/L)</u>	<u>MCLG^a (mg/L)</u>
Antimony	0.006	0.006
Arsenic	0.01	NE
Cadmium	0.005 ^b	0.005 ^b
Copper	1.3 ^c	1.3 ^c
Iron	0.3 ^d	NE
Lead	0.015 ^c	0
Manganese	0.05 ^d	NE
Mercury	0.002 ^b	0.002 ^b
Silver	NE	NE
Thallium	0.002 ^b	0.0005
Zinc	5.0 ^d	NE

NE - Not Established

^a 40 CFR § 141.51(b)

^b 40 CFR § 141.62(c)

^c 40 CFR § 141.80(c) No MCL, but specifies BAT to be applied

^d 40 CFR § 143.3 Secondary MCL

⁵ As provided under Section 303 of the Clean Water Act, 33 USC § 1313, the State of Montana has promulgated water quality standards. See the discussion concerning State surface water quality requirements in endnotes.

⁶ Not an ARAR since the State of Montana has promulgated water quality standards.

⁷ Not an ARAR since the regulation of storm-water runoff from mining operations is excluded in 40 CFR § 122.26. Defer to State of Montana requirements for storm-water control and BMP.

⁸ These are enforceable in Montana under the Clean Air Act of Montana and corresponding regulations, MCA § 75-2-101, et seq., and ARM § 17.8.101-230.

⁹ Not an ARAR since only “major” sources are subject to NAAQS requirements. Defer to corresponding State of Montana standards, found at ARM § 17.8.222 and ARM § 17.8.223. These provisions establish standards for PM-10 and lead emissions to air, respectively. The lead standard is 1.5

$\mu\text{g}/\text{m}^3$, maximum arithmetic mean averaged over a calendar quarter and the PM-10 standard is 150 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), 24-hour average concentration.

¹⁰ Solid waste from the extraction, beneficiation, and processing of ores and minerals is not a listed waste in RCRA due to the Bevill Exemption, as outlined in 40 CFR § 261.4(b)(7). Further the State of Montana has incorporated by reference all federal RCRA requirements, as provided by ARM § 17.53.105, unless mentioned otherwise below.

¹¹ Not an ARAR – Bevill Exemption.

¹² Not an ARAR – Bevill Exemption. The RCRA Subtitle C requirements discuss provisions related to solid wastes left in place in “waste management areas,” (i.e. a repository) as a result of removal actions. Due to the similarity of mining waste repositories to the RCRA “waste management unit,” certain discrete portions of the RCRA Subtitle C implementing regulations will be relevant and appropriate for the Block P Mine Complex removal action. This will be further discussed in the Table H-3, Action-Specific ARARs.

¹³ The Clean Water Act, 33 U.S.C. § 1251, et seq., provides the authority for each state to adopt water quality standards (40 CFR Part 131) designed to protect beneficial uses of each water body and requires each state to designate uses for each water body. The Montana Water Quality Act, MCA Section 75-5-101, et seq., establishes requirements to protect, maintain, and improve the quality of surface and groundwater.

¹⁴ Montana's regulations classify State waters according to quality, place restrictions on the discharge of pollutants to State waters, and prohibit degradation of State waters. Pursuant to this authority and the criteria established by Montana surface water quality regulations, ARM § 17.30.601, et seq., Montana has established the Water-Use Classification System. Under ARM § 17.30.610, tributaries to the Missouri River have been classified “B-1” according to the Water-Use Classification System. Galena Creek is a part of the Missouri River drainage, which is a documented recreational fishery.

Attainment of water quality standards, as described in this section, is beyond the scope of this removal action. Water quality will be addressed by the actions taken within the scope of work outlined in the EE/CA by reducing metals loading from surface runoff, groundwater infiltration through tailings and waste rock, and discharging mine workings passing over tailings and waste rock.

Waters classified B-1 are, after conventional treatment for removal of naturally present impurities, suitable for drinking, culinary and food processing purposes. These waters are also suitable for bathing, swimming and recreation, growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers, and use for agricultural and industrial purposes. This section provides also that concentrations of carcinogenic, bioconcentrating, toxic or harmful parameters which would remain in water after conventional water treatment may not exceed standards set forth in department circular DEQ-7. DEQ-7 provides that “whenever both Aquatic Life Standards and Human Health Standards exist for the same analyte, the more restrictive of these values will be used as the numeric Surface Water Quality Standard.” These numerical standards for the contaminants of concern are listed below.

Montana DEQ-7 Surface Water Quality Standards

Aquatic Life Standards

Contaminant	Acute (µg/L)	Chronic (µg/L)	Human Health Standards (µg/L)
Aluminum ^a	750	87	NE
Antimony	NE	NE	5.6
Arsenic	340	150	10
Cadmium	2.1 ^b /1.1 ^c /0.52 ^d	0.27 ^b /0.16 ^c /0.10 ^d	5
Copper	14 ^b /7.3 ^c /3.8 ^d	9.3 ^b /5.2 ^c /2.8 ^d	1,300
Iron ^e	NE	1,000	NE
Lead	82 ^b /34 ^c /14 ^d	3.2 ^b /1.3 ^c /0.54 ^d	15
Manganese ^e	NE	NE	NE
Mercury	1.7	0.91	0.05
Silver	4.1 ^b /1.2 ^c /0.37 ^d	NE	100
Thallium	NE	NE	0.24
Zinc	120 ^b /67 ^c /37 ^d	120 ^b /67 ^c /37 ^d	2,000

NE Not Established

^a The aluminum standard is based on the dissolved fraction. All other parameters are based on the total recoverable fraction.

^b The aquatic life standard is based on hardness. Value shown is for a hardness of 100 mg/L as CaCO₃.

^c The aquatic life standard is based on hardness. Value shown is for a hardness of 50 mg/L as CaCO₃.

^d The aquatic life standard is based on hardness. Value shown is for a hardness of 25 mg/L as CaCO₃.

^e Concentrations of iron and manganese must not reach values that interfere with the uses specified in the surface and groundwater standards (ARM 17.30.601 et seq. and ARM § 17.30.1001 et seq.). The secondary maximum contaminant levels of 300 µg/L and 50 µg/L, respectively, may be considered guidance to determine levels that will interfere with the specified uses.

The B-1 classification standards at ARM §17.30.623 also include the following criteria: 1) dissolved oxygen concentration must not be reduced below the levels given in department circular DEQ-7; 2) induced variation of hydrogen ion concentration (pH) within the range of 6.5 to 8.5 must be less than 0.5 pH unit. Natural pH outside of this range must be maintained without change. Natural pH above 7.0 must be maintained above 7.0; 3) the maximum allowable increase above naturally occurring turbidity is 5 nephelometric turbidity units; 4) temperature increases must be kept within prescribed limits; 5) no increases are allowed above naturally occurring concentrations of sediment or suspended sediment, settleable solids, oils or floating solids, which will or are likely to create a nuisance or render the waters harmful, detrimental, or injurious to public health, recreation, safety, welfare, livestock, wild animals, birds, fish or other wildlife; 6) true color must not be increased more than five color units above naturally occurring color.

¹⁵ Provides that surface waters must be free of substances attributable to industrial practices or other discharges that will: (a) settle to form objectionable sludge deposits or emulsions beneath the surface of the water or upon adjoining shorelines; (b) create floating debris, scum, a visible oil film (or be present in concentrations at or in excess of 10 milligrams per liter) or globules of grease or other floating materials; (c) produce odors, colors or other conditions which create a nuisance or render undesirable tastes to fish flesh or make fish inedible; (d) create concentrations or combinations of materials which are toxic or harmful to human, animal, plant or aquatic life; (e) create conditions which produce undesirable aquatic life.

ARM §17.30.637 also states that no waste may be discharged and no activities conducted which, either alone or in combination with other waste activities, will cause violation of surface water quality standards.

In addition, ARM §17.30.637 provides that leaching pads, tailings ponds, or water or waste or product holding facilities must be located, constructed, operated and maintained in such a manner and of such materials to prevent any discharge, seepage, drainage, infiltration, or flow which may result in pollution of state waters, and a monitoring system may be required to ensure such compliance.

¹⁶ The provisions of this subchapter apply to any activity of man resulting in a new or increased source which may cause degradation. "New or increased source" means an activity resulting in a change of existing water quality occurring on or after April 29, 1993. The term does not include the following: (b) nonpoint sources discharging prior to April 29, 1993, where "nonpoint source" means a diffuse source of pollutants resulting from the activities of man over a relatively large area, the effects of which normally must be addressed or controlled by a management or conservation practice. The removal action in the Block P Mine Complex will consolidate and cap several areas of nonpoint sources from mining activities before April 29, 1993, thus this is not applicable.

¹⁷ Provides that groundwater is classified into Classes I through IV based on its specific conductance and establishes the applicable ground water quality standards with respect to each groundwater classification. Groundwater throughout the Block P Mine Complex is considered Class I

groundwater to be maintained for its potential use as a public and private drinking water supply. The proposed action does not directly address groundwater and the existing impacts to groundwater quality from the site.

Concentrations of dissolved substances in Class I or II groundwater may not exceed the human health standards listed in Circular DEQ-7. These levels are listed below for the primary contaminants of concern.

<u>Contaminant</u>	<u>DEQ-7 Standard (mg/L)^a</u>
Antimony	0.006
Arsenic	0.01
Cadmium	0.005
Copper	1.3
Iron	NE ^b
Lead	0.015
Manganese	NE ^b
Mercury	0.002
Silver	0.1
Thallium	0.002
Zinc	2.0

NE- Not Established

^a DEQ-7 standards for metals and arsenic in ground water are based on the dissolved portion of the sample (after filtration through a 0.45 μ m membrane filter).

^b Concentrations of iron and manganese must not reach values that interfere with the uses specified in the surface and groundwater standards (ARM § 17.30.601 et seq. and ARM § 17.30.1001 et seq.). The secondary maximum contaminant levels of 300 μ g/L and 50 μ g/L, respectively, may be considered guidance to determine levels that will interfere with the specified uses.

Response actions must meet the DEQ-7 standards for all contaminants at the site. In addition, for Class I and Class II ground water, no increase of a parameter may cause a violation of MCA § 75-5-303, (nondegradation).

ARM §17.30.1006 requires that concentrations of other dissolved or suspended substances must not exceed levels that render the waters harmful, detrimental or injurious to public health. Maximum allowable concentrations of these substances also must not exceed acute or chronic problem levels that would adversely affect existing or designated beneficial uses of groundwater of that classification.

¹⁸ Establishes the applicability and basis for the groundwater standards in ARM § 17.30.1006, which establish the maximum allowable changes in groundwater quality and may limit discharges to groundwater.

¹⁹ This section provides that any groundwater whose existing quality is higher than the standard for its classification must be maintained at that high quality in accordance with MCA § 75-5-303 and ARM §17.30.7.

An additional concern with respect to ARARs for groundwater is the impact of groundwater upon surface water. If significant loadings of contaminants from groundwater sources to any tributaries within the Block P Mine Complex contribute to the inability of the stream to meet B-1 class standards, then alternatives to alleviate such groundwater loading must be evaluated and, if appropriate, implemented. Groundwater in certain areas may have to be remediated to levels more stringent than the groundwater classification standards in order to achieve the standards for affected surface water. See Compliance with Federal Water Quality Criteria, OSWER Publication 9234.2-09/FS (June 1990) ("Where the ground water flows naturally into the surface water, the ground-water remediation should be designed so that the receiving surface-water body will be able to meet any ambient water-quality standards [such as State WQSs or FWQC] that may be ARARs for the surface water.")

²⁰ These provisions establish standards for gross particulate matter emissions to air. Montana standards are found at ARM § 17.8.220 and require particulate matter deposition not exceed 10 g/m^2 , averaged over a 30-day period.

²¹ These provisions establish standards for lead emissions to air. Montana standards are found at ARM § 17.8.222 and require airborne lead concentrations not exceed $1.5 \text{ } \mu\text{g/m}^3$, maximum arithmetic mean averaged over a calendar quarter.

²² These provisions establish standards for PM-10 emissions to air. Montana standards are found at ARM § 17.8.223 and require airborne PM-10 concentrations not exceed 150 micrograms per cubic meter ($\mu\text{g/m}^3$), averaged over a 24-hour period.

²³ These provisions require construction sites or demolition projects take reasonable precautions to control emissions of airborne particulate matter. Such emissions of airborne particulate matter from any stationary source shall not exhibit an opacity of 20% or greater averaged over six consecutive minutes.

²⁴ Each operator shall employ fugitive dust control measures as an integral part of site preparation... and reclamation operations in accordance with MCA § 82-4-231(10)(m), which states "stabilize and protect all surface areas, including spoil piles, to effectively control air pollution" and applicable federal and state air quality standards. Air monitoring equipment must be installed and monitoring must be conducted in accordance with the air monitoring plan required under ARM §17.24.311, a relevant and appropriate standard.

**Table H-2
Location-Specific ARARs
Block P Mine Complex
Monarch, Montana**

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/Relevant and Appropriate?
<i>Federal</i>			
National Historic Preservation Act	16 USC § 470 36 CFR Part 800 40 CFR 6.301 (b)	Requires Federal Agencies to take into account the effect of any Federally-assisted undertaking or licensing on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places.	Applicable
Archeological and Historic Preservation Act	16 USC § 469 40 CFR 6.301(c)	Establishes procedures to provide for preservation of historical and archeological data which might be destroyed through alteration of terrain as a result of a Federal construction project or a Federally licenses activity or program.	Applicable
Protection of Wetlands Order	33 USC § 1344	Avoid adverse impacts associated with the destruction or loss of wetlands and avoid support of new construction in wetlands if a practicable alternative exists.	Applicable ¹
	40 CFR Part 6 Appendix A, Exec. Order 11,990	Prohibits discharge of dredged or fill material into waters of the United States	Relevant and Appropriate
Historic Sites, Buildings and Antiquities	16 USC §§ 461-467 40 CFR 6.301(a)	Requires Federal agencies to consider the existence and location of landmarks on the National Registry of Natural Landmarks to avoid undesirable impacts on such landmarks.	Applicable
Fish and Wildlife Coordination Act	16 USC 49, §§ 2901-2912 40 CFR 6.302(g)	Requires consultation when Federal department or agency proposes or authorizes any modification of any stream or other water body to assure adequate protection of fish and wildlife resources.	Applicable
Floodplain Management Order	40 CFR Part 6 Appendix A, Exec. Order 11,990	Requires Federal agencies to evaluate the potential effects of actions they may take in a floodplain to avoid the adverse impacts associated with direct and indirect development of a floodplain to the extent possible.	Relevant and Appropriate

**Table H-2
Location-Specific ARARs
Block P Mine Complex
Monarch, Montana**

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/Relevant and Appropriate?
Endangered Species Act	16 USC §§ 1531-1543 40 CFR 6.302(h) 50 CFR Part 402	Activities may not jeopardize the continued existence of any threatened or endangered species or destroy or adversely modify a critical habitat.	Applicable ²
Bald Eagle Protection Act	16 USC § 668, et seq.	Requires continued consultation with the USFWS during remedial design and remedial construction to ensure that any cleanup of the site does not unnecessarily adversely affect the bald or golden eagle.	Applicable
Migratory Bird Treaty Act	16 USC § 703, et seq.	Establishes a federal responsibility for the protection of the international migratory bird resource and requires continued consultation with the USFWS during remedial design and remedial construction to ensure that the cleanup of the site does not unnecessarily impact migratory birds.	Applicable
Hazardous Waste and Solid Waste Requirements	40 CFR Section 241.202-1 40 CFR Section 258.13 40 CFR Section 258.14 40 CFR Section 264.18	Location standards and restrictions for hazardous waste TSD facilities. TSD facility setbacks from faults TSD facility exclusions from seismic impact zones Location standards and restrictions for hazardous waste TSD facilities.	Relevant and Appropriate
State of Montana			
Floodplain and Floodway Management Act	MCA 76-5-401 MCA 76-5-402	Lists the uses permissible in a floodway which do not require structures other than portable structures, fill, or permanent storage of materials or equipment. Lists the permissible uses within floodplains but outside of floodway.	Relevant and Appropriate Relevant and Appropriate

**Table H-2
Location-Specific ARARs
Block P Mine Complex
Monarch, Montana**

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/Relevant and Appropriate?
Floodplain and Floodway Management Act (continued)	MCA 76-5-403	Lists certain uses which are prohibited in a designated floodway, including: any change that will cause water to be diverted from the established floodway, cause erosion, obstruct the natural flow of water, or reduce the carrying capacity of the floodway, or the concentration or permanent storage of an object subject to floatation or movement during flood-level periods.	Relevant and Appropriate ³
Floodplain Management Regulations	ARM 36.15.216	The factors to consider in determining whether a permit should be issued to establish or alter an artificial obstruction or nonconforming use in the floodplain or floodway are provided in this section.	Relevant and Appropriate (substantive provisions only) ⁴
	ARM 36.15.601	Open space uses allowed in the floodway without a permit.	Relevant and Appropriate
	ARM 36.15.602	Permitted uses allowed in floodway requiring a permit.	Relevant and Appropriate (substantive provisions only) ⁵
	ARM 36.15.603	Proposed diversions or changes in place of diversions must be evaluated to determine whether they may significantly affect flood flows and, therefore, require a permit.	Relevant and Appropriate (substantive provisions only)
	ARM 36.15.604	Prohibits new artificial obstructions or nonconforming uses that will increase the upstream elevation of the base flood 0.5 of a foot or significantly increased flood velocities.	Relevant and Appropriate
	ARM 36.15.605	Identifies artificial obstructions and nonconforming uses that are prohibited within the designated floodway except as allowed by permit and includes "a structure or excavation that will cause water to be diverted from the established floodway, cause erosion, obstruct the natural flow of water, or reduce the carrying capacity of the floodway..." Solid waste disposal and storage of toxic, flammable, hazardous or explosive materials are also prohibited.	

**Table H-2
Location-Specific ARARs
Block P Mine Complex
Monarch, Montana**

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/Relevant and Appropriate?
Floodplain Management Regulations (continued)	ARM 36.15.606	Identifies flood control works that are allowed within designated floodways pursuant to permit and certain conditions including: flood control levies and flood walls, riprap, channelization projects, and dams.	Relevant and Appropriate ⁶
	ARM 36.15.701	Describes allowed uses in the flood fringe.	Relevant and Appropriate
	ARM 36.15.703	Prohibited uses within the flood fringe including solid and hazardous waste disposal and storage of toxic, flammable, or explosive materials.	Relevant and Appropriate
	ARM 36.15.801	Allowed uses where the floodway is not designated or where no flood elevations are available.	Relevant and Appropriate
Natural Streambed and Land Preservation Standards	MCA 87-5-501, 502, 503 & 504	Fish and wildlife resources are to be protected and no construction project or hydraulic project shall adversely affect game or fish habitat.	Applicable

¹ No adverse impacts anticipated due to scope of the removal action and the fact that no destruction or loss of wetlands will result from the removal action.

² No “Threatened/Endangered Species or Critical Habitat” have been identified that would be affected by the removal action.

³ Substantive portions are relevant and appropriate to the diversion channels to be constructed as part of the removal action. In this remote location, a “designated floodplain” has not been identified. In the absence of a designated floodplain, the standards discussed in this section are identified as relevant and appropriate. The lead agency can determine, based on its determination of the areas likely to be affected by a base flood, where the identified requirements and restrictions should be applied.

⁴ No planned artificial obstruction or nonconforming use that will pose any of the hazards listed during a flood event.

⁵ Due to limited scope of the removal action, there are none of the listed uses planned within the floodway.

⁶ Substantive portions are relevant and appropriate to the diversion channels to be constructed as part of the removal action, provided Galena Creek has been designated a floodway or in those areas identified by the lead agency as a floodway.

**Table H-3
Action-Specific ARARs
Block P Mine Complex
Monarch, Montana**

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/Relevant and Appropriate?
Federal			
Clean Water Act	33 USC § 1342		
NPDES	40 CFR Part 122	Requires permits for the discharge of pollutants from any point source into waters of the United States.	Not Applicable -
Surface Mining Control and Reclamation Act	30 USC §§ 1201-1328 30 CFR Part 816	Permanent program performance standards for surface mining activities.	Not Applicable
Hazardous Materials Transportation Act HAZMAT Transportation Regulations	49 USC §§ 5101-5127 49 CFR Parts 10, 171-177	Regulates transportation of hazardous materials.	Not Applicable – No “Offsite Transportation” Planned
Resource Conservation and Recovery Act	42 USC § 6901-6987		
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	40 CFR Part 264	Establish minimum national standards which define the acceptable management of hazardous waste for owners and operators of facilities which treat, store, or dispose of hazardous waste.	Not Applicable – Bevill Amendment ¹
Land Disposal Restrictions	40 CFR Part 268	Establish provisions restricting certain hazardous wastes from land disposal.	
State of Montana			
Montana Solid Waste Management Act	MCA 75-10-201, et seq.		
Solid Waste Management Regulations	ARM 17.50.505 ARM 17.50.506	Establishes standards for solid waste management facilities Establishes design criteria for landfills.	Applicable

**Table H-3
Action-Specific ARARs
Block P Mine Complex
Monarch, Montana**

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/Relevant and Appropriate?
Solid Waste Management Regulations (continued)	ARM 17.50.523	Solid waste must be transported in such a manner as to prevent its discharge, dumping, spilling or leaking from the transport vehicles.	Applicable
	ARM 17.50.530	Establishes closure requirements for landfills.	Applicable ²
	ARM 17.50.531	Establishes post-closure care requirements for Class II landfills.	Applicable ³
	ARM 17.50.706	Establishes location and number of monitoring wells and landfill sites.	
	ARM 17.50.707	Establishes monitoring well construction requirements.	Applicable
	ARM 17.50.722	Establishes monitoring well abandonment requirements.	
	ARM 17.50.724	Establishes monitoring well network maintenance requirements.	

Table H-3
Action-Specific ARARs
Block P Mine Complex
Monarch, Montana

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/Relevant and Appropriate?
Montana Strip and Underground Mine Reclamation Act	MCA 82-4-231	Operations shall reclaim and revegetate the land affected by his operation rapidly, completely, and effectively. The operator must prepare and carry out a method of operation plan to grade, backfill, topsoil, reduce highways, stabilize subsidence, control water, and reclaim the land. In so doing, all measures must be taken to eliminate damage from soil erosion, subsidence, land slides, water pollution, and hazards dangerous to life and property.	Relevant and Appropriate ⁴
	MCA 82-4-233	Requires that after the operation has been backfilled, graded, topsoiled and approved, the vegetative cover must be capable of feeding and withstanding grazing pressure from wildlife and livestock, regenerate under natural conditions prevailing at the site, and prevent soil erosion.	
	MCA 82-4-336	Requires disturbed areas be reclaimed to utility and stability comparable to adjacent areas.	Relevant and Appropriate
Backfilling and Grading Requirements	ARM 17.24.501	These sections give general backfilling and grading requirements.	Relevant and Appropriate
	ARM 17.24.504	Provides that permanent impoundments may be retained under certain circumstances.	Relevant and Appropriate
	ARM 17.24.505	Provides requirements for burial and treatment of exposed waste materials.	Relevant and Appropriate
	ARM 17.24.519	The operator may be required to monitor settling of regraded areas.	Relevant and Appropriate ⁵
	ARM 17.24.520	Spoil materials may be disposed of on-site in accordance with the requirements of this section. This section contains specific requirements for siting, surface runoff, construction of underdrains, and revegetation.	Relevant and Appropriate ⁶

**Table H-3
Action-Specific ARARs
Block P Mine Complex
Monarch, Montana**

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/Relevant and Appropriate?
Montana Strip and Underground Mine Reclamation Act (continued)	MCA 82-4-231, 233 & 336		
Hydrology Requirements	ARM 17.24.631	In accordance with this section, reclamation operations must be planned and conducted to minimize disturbance to the prevailing hydrologic balance and to prevent material damage to the prevailing hydrologic balance. Changes in water quality and quantity must be minimized and reclamation practices that will prevent or minimize water pollution should be emphasized. Proper pollution control and minimization practices include but are not limited to stabilizing disturbed areas, diverting runoff, regulating channel velocity of water, achieving quickly germinating and growing stands of temporary vegetation, and lining drainage channels.	Relevant and Appropriate ⁷
	ARM 17.24.633	Specifies that "all surface drainage from the disturbed area, including disturbed areas that have been graded, seeded, or planted must be treated..." Sediment control must be maintained until the disturbed area has been restored and revegetation requirements have been met.	Relevant and Appropriate ⁸
	ARM 17.24.634	Specifies requirements for constructed and reclaimed areas of drainage basins, including channel engineering, contours, dynamic equilibrium with the hydraulic system, provide for floods, provide for long-term relative stability of the landscape, and establish or restore diversity of aquatic habitats and riparian vegetation.	Relevant and Appropriate
	ARM 17.24.635-637	Set forth requirements for temporary and permanent diversions.	Relevant and Appropriate
	ARM 17.24.638	Sediment control measures shall be designed using the best technology currently available to prevent additional sediment to streamflows, meet the more stringent of federal or state effluent limitation, and minimize erosion.	Relevant and Appropriate

Table H-3
Action-Specific ARARs
Block P Mine Complex
Monarch, Montana

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/Relevant and Appropriate?
Hydrology Requirements (continued)	ARM 17.24.640	Provides that discharge from sedimentation ponds, permanent and temporary impoundments, and diversions shall be controlled by energy dissipaters, riprap channels, and other devices, where necessary, to reduce erosion, prevent deepening or enlargement of stream channels, and to minimize disturbance.	Relevant and Appropriate
	ARM 17.24.641	Sets forth methods for prevention of drainage from acid- and toxic-forming spoils into ground and surface waters.	Relevant and Appropriate
	ARM 17.24.645-646	Provides for groundwater protection, groundwater recharge protection, and surface and groundwater monitoring.	Relevant and Appropriate, Outside Scope ⁹
	ARM 17.24.649	Prohibits the discharge, diversion, or infiltration of surface and groundwater into existing underground mine workings.	Relevant and Appropriate ¹⁰
	ARM 17.24.651	Requires that no land within 100 feet of a perennial stream or intermittent stream or a stream with a biological community will be disturbed unless the original stream function will be restored and the water quantity and quality and other environmental resources will not be adversely affected.	Relevant and Appropriate

Table H-3
Action-Specific ARARs
Block P Mine Complex
Monarch, Montana

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/Relevant and Appropriate?
Top Soiling, Revegetation, and Protection of Wildlife and Air Resource Regulations	ARM 17.24.703	Provides requirements for use of materials other than, or along with, soil for surfacing of spoil.	Relevant and Appropriate
	ARM 17.24.711	Vegetative cover requirements.	Relevant and Appropriate ¹¹
	ARM 17.24.713	Timing of seed application.	Relevant and Appropriate
	ARM 17.24.714	Pursuant to this section, as soon as practicable, a mulchy or cover crop of small grains, grasses or legumes or both must be used on all regraded and resoiled areas to control erosion, promote germination of seeds and increase the moisture retention of the soil until adequate permanent cover is established.	Relevant and Appropriate
	ARM 17.24.716	Establish the required method of revegetation and provides that introduced species may be substituted for native species as part of an approved plan.	Relevant and Appropriate
	ARM 17.24.717	Whenever tree species are necessary, trees adapted for local site conditions and climate shall be used.	Relevant and Appropriate
	ARM 17.24.718	Soil amendments must be used as necessary to aid in the establishment of permanent vegetative cover. Irrigation, management, fencing, or other measures may also be used after review and approval by the department.	Relevant and Appropriate
	ARM 17.24.721	In accordance with this section, rills and gullies may need to be filled, graded or otherwise stabilized and the area reseeded.	Relevant and Appropriate
	ARM 17.24.723	Monitoring of vegetation, soils, and wildlife.	Relevant and Appropriate ¹²
	ARM 17.24.724	Success of revegetation shall be evaluated.	Relevant and Appropriate

**Table H-3
Action-Specific ARARs
Block P Mine Complex
Monarch, Montana**

Standard, Requirement Criteria, or Limitation	Citation	Description	Applicable/Relevant and Appropriate?
Top Soiling, Revegetation, and Protection of Wildlife and Air Resource Regulations (continued)	ARM 17.24.726	Sets means of measuring productivity.	Relevant and Appropriate
	ARM 17.24.731	The revegetated area must furnish palatable forage in comparable quantity and quality during the same grazing period as the reference areas.	Relevant and Appropriate
	ARM 17.24.751	Pursuant to this section, required site activities must be conducted so as to avoid or minimize impacts to important fish and wildlife species, including critical habitat and any threatened or endangered species identified at the site.	Relevant and Appropriate ¹³

¹ The mining waste on this site is considered is exempt from RCRA, per Bevill Amendment. However, 40 CFR Part 264.310 (a), (b), and (5), relating to closure, caps, and run-on/run-off controls will be incorporated into the removal action, along with State of Montana Solid Waste Management Act and Regulations, which provide more specific guidelines. The presentation of RCRA Subtitle C requirements in this section assumes that there will be solid wastes placed in “waste management areas” (i.e., the repository) as a result of this removal action. Because of the similarity of the proposed mine waste repository to the RCRA “waste management unit,” certain discrete portions of the RCRA Subtitle C implementing regulations will be relevant and appropriate for the Block P Mine Complex removal action. RCRA Subtitle C and implementing regulations are designated as applicable for any hazardous wastes that are actively “generated” as part of this removal action or that were “placed” or “disposed” after 1980. All federal RCRA Subtitle C requirements set forth below are incorporated by reference as State of Montana requirements as provided for under ARM 17.53.105 unless mentioned otherwise below.

² ARM 17.50.530(1)(a) and (b) are applicable portions of this regulation, while the remainder of the citation is merely administrative. ARM 17.50.530(1)(a) - “Owners or operators of all Class II landfill units must install a final cover system that is designed to minimize infiltration and erosion. The final cover system must be designed and constructed to: (i) minimize infiltration through the closed unit by the use of an infiltration layer that contains a minimum 18 inches of earthen material and have a permeability less than or equal to the permeability of any bottom liner, barrier layer, or natural subsoils present, or a permeability no greater than 1×10^{-5} cm/sec, whichever is less; (ii) minimize erosion of the final cover by the use of a seed bed layer that contains a minimum of 6 inches of earthen material that is capable of sustaining native plant growth and protecting the infiltration layer from frost effects and rooting damage; and (iii) revegetate the final cover with native plant growth within 1 year of placement of the final cover. The department may approve alternative revegetation plant species or an extension in the time requirement for revegetation.” ARM 17.50.530(1)(b) - The department may approve an alternative final cover design that includes: (i) an infiltration layer

that achieves reduction in infiltration at least equivalent to the infiltration layer specified in (1) (a) (i) and (ii) above; and (ii) an erosion layer that provides protection from wind and water erosion equivalent to the erosion layer specified in (1) (a) (ii) and (iii) above.”

³ ARM 17.50.531(1)(a)(i) pertaining to maintaining the cover is applicable and ARM 17.50.531(1)(a)(iii) applies if the removal action includes post-removal ground water monitoring via installed wells.

⁴ Portions are relevant and appropriate. MCA 82-4-231 and MCA 82-4-233 are provisions specific to coal and uranium mining reclamation, not metal mining reclamation, and as such, only certain provisions are relevant and appropriate for this removal action.

⁵ This provision requires mining operators to monitor settlement of disturbed areas to determine if future/planned mine reclamation practices need to be altered. Given that the scope of the removal action is to consolidate and cap mine wastes and the other substantive provisions of the State of Montana Solid Waste Management Act and Montana Strip and Underground Mine Reclamation Act call for specific monitoring of the cap and repository until properly revegetated, the intent of this provision will be met by implementing the removal action in accordance with other ARARs. Existing underground workings under the waste rock may cause settlement.

⁶ Only portions are relevant and appropriate. This provision regulates the mining operator disposing of spoil materials within permitted areas of an active mine site, which has boundaries that are different from the defined site boundaries for the Block P Mine Complex. The planned removal action will simply consolidate and cap existing waste piles into the selected repository location, which will meet the intent of ARM 17.24.520(3), which describes the siting criteria, construction requirements, and revegetation efforts that must be undertaken to comply with the substantive requirements.

⁷ Portions are relevant and appropriate, however, ARM 17.24.631(4), which outlines treatment as a last resort for controlling water pollution as follows, “If pollution can be controlled only by treatment, the permittee shall operate and maintain the necessary water treatment facilities for as long as treatment is required. The department may specify which practices, used to minimize water pollution, may be used on a permanent basis.” is outside the scope of the removal action, which is designed only to control the source and consolidate mine wastes, thereby reducing loading and leaching into surface waters.

⁸ There is no planned treatment of runoff or storm-water. Nevertheless, best management practices for mitigating the sediment from storm-water and runoff will be employed as part of the removal action to meet the intent of this regulation.

⁹ This regulation is intended for use by mining operators to limit ground water impacts during mining and requires operators to use a monitoring well network and sampling around an operating mine to maintain an understanding of the impacts of the ongoing mining operation to ground water and surface water. As such, this requirement is outside the scope of this source control removal action. It could, however, be used to guide any future ground water and adit discharge water monitoring efforts at the site if EPA deems that appropriate for continued remediation efforts.

¹⁰ There is no planned discharge as part of the removal action. However, run-off/stormwater controls will be needed.

¹¹ Substantive portions are relevant and appropriate. Portions related to agricultural and ranching land-use applications are not applicable to this removal action.

¹² Substantive portions are relevant and appropriate. This regulation is intended for permitted mining operators and monitoring the efficacy of post-remediation efforts at the site. This removal action will apply these substantive requirements to meet the intent of this regulation.

¹³ Portions are relevant and appropriate. ARM 17.24.751(2)(e) - Consult with appropriate state and federal fish and wildlife and land management agencies to ensure that reclamation will provide for habitat needs of various wildlife species in accordance with the approved postmining land use. Pursuant to MCA 82-4-231(10)(j) and MCA 82-4-232(9), special attention must be given to inanimate elements such as rock outcrops, boulders, rubble, dead trees, etc., that may have existed on the surface prior to mining, and to plant species with proven nutritional and cover value for fish and wildlife. Plant groupings and water sources must be distributed to fulfill the requirements of fish and wildlife.