ACTION MEMORANDUM

MILLER CREEK RESPONSE ACTION
NEW WORLD MINING DISTRICT
RESPONSE AND RESTORATION PROJECT

Gallatin National Forest - Gardiner Ranger District
Park County, Montana

February 2004

ACTION MEMORANDUM

Date: February 23, 2004

Subject: Request for Removal Action
New World Mining District Response and Restoration Project
Gallatin and Custer National Forests

From: Mary Beth Marks, On-Scene Coordinator

To: Regional Forester

Through: Ken Britton, District Ranger, Gardiner Ranger District
Rebecca J. Heath, Forest Supervisor, Gallatin National Forest

CONTENTS

I. PURPOSE

The purpose of this Action Memorandum is to request and document approval of the proposed non-time-critical Response Action described herein for mine waste deposits located in the Miller Creek drainage. Mine waste deposits in Miller Creek are historic mining disturbances included in the New World Mining District Response and Restoration Project. The project sites are located in Park County, Montana. Mine waste sites located in Miller Creek are sources of metals contaminants that degrade water quality in Miller Creek, which drains into Soda Butte Creek and eventually into the Yellowstone River. The discussion provided in this memorandum will substantiate the need for a Response Action at the site, identify the proposed action, and explain the rationale for the proposed action.

The scope of this Response Action is directed at eliminating or reducing uncontrolled releases of metals from mining-related sources in Miller Creek. Mine waste at the Miller Creek dump sites consists of about 3,150 cubic meters (4,120 cubic yards) of waste rock over an area of 1.2 hectares (3.0 acres). The preferred alternative that will be further described in this document involves removal of two waste rock dumps, in-situ treatment of three other waste rock dumps, no action at 41 remaining waste rock dumps, rehabilitation of roads in the mining district to reduce sediment sources, and other restoration actions.

By addressing releases to surface and groundwater from metals-enriched mine wastes and other sediment sources, some reduction in contaminant concentrations is expected in surface water, groundwater, and new stream sediment accumulations. However, this Response Action does not directly address existing groundwater contamination and does not address mine discharges located in the Miller Creek watershed. This Response Action, therefore, is considered an incremental step toward cleanup of man-caused mining impacts in the Miller Creek drainage, and additional actions may be necessary depending on the effectiveness of this Response Action and future evaluations of potential alternatives that directly address adit discharges.

The Miller Creek Response Action will be executed by following the non-time-critical removal action process as defined by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA; 42 USC 9604) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP; 40 CFR Part 300). Response actions -- as explained in the U.S. Environmental Protection Agency's (EPA) *Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA* -- are implemented to respond to "the cleanup or removal of released hazardous substances from the

environment … as may be necessary to prevent, minimize, or mitigate damage to the public health or welfare or to the environment…" (EPA, 1993).

This is the fourth Response Action proposed for this multi-year project. An Overall Project Work Plan prepared for the project (Maxim, 1999a), and work plans prepared annually (Maxim, 2003a; 2002a; 2001a; 2000; 1999b) describe in detail the process for prioritizing sites and the overall schedule for cleanup of historic mining wastes present in the District. A Draft Engineering Evaluation/Cost Analysis (EE/CA) was prepared to develop various alternatives that address impacts associated with hazardous substances present in Miller Creek (Maxim, 2003b). The EE/CA provides the details and basis for the proposed Response Action. The Final EE/CA, which is an abbreviated summary of the engineering analysis and contains responses to comments received on the Draft EE/CA, is attached to this memorandum as a supporting document. The more complete Draft EE/CA is available at three document repositories in Cooke City, Bozeman, and Gardiner, and on the project website at **http://www.fs.fed.us/r1/gallatin.**

II: SITE CONDITIONS AND BACKGROUND

A. Site Description

The primary environmental issues within the New World Mining District (District) are associated with impacts from historic and recent gold, silver, copper, and lead mining activities that were initiated with minerals prospecting in the area in about 1869. Mining disturbances are primarily situated on National Forest System lands. Human health and environmental issues are related to elevated levels of heavy metal contaminants present in mine waste dumps, metals-rich soils, acid mine discharges, and in-stream sediments. Mine waste has been subject to erosion and leaching of contaminants, and perennial acid mine discharges directly impact water quality in the District.

A Consent Decree negotiated with the former owner of the mining interests in the District provides the terms and funding for cleanup efforts. For cleanup purposes, there are two categories of properties in the District: District Property and non-District Property. District Property is defined as including all property or interests in property that Crown Butte Mining, Inc. (CBMI) relinquished to the United States under the terms and conditions of a Settlement Agreement and Consent Decree entered by the United States District Court for the District of Montana in 1998. Non-District Property includes private land and other federal lands within the project boundary. Mining wastes present on District Property must first be addressed before cleanup of mining wastes on non-District Property can proceed. Contaminant source areas included in the proposed Miller Creek Response Action are located on District Property.

1. Removal Site Evaluation

In 1996, the EPA began a site investigation of mining impacts in the District, which was performed by URS Operating Systems (UOS). The EPA investigation involved installing monitoring wells, surface water sampling, groundwater monitoring, and completing a groundwater tracer study. The results of these studies were published in a technical report (UOS, 1998) that included the following: a review of all previous surface water and groundwater data collected by the Montana Department of Natural Resources and Conservation, USDA Forest Service, CBMI, EPA, and UOS; an evaluation of the data collected during the 1996, 1997, and 1998 field seasons; and an overall evaluation of the complete data set with respect to restoration and reclamation of the historic abandoned mining operations. Site investigation data adequately document impacts to human health and the environment associated with historic mining.

2. Physical Location

The New World Mining District falls within the boundaries of the Gallatin and the Custer National Forests and abuts Yellowstone National Park's northeast corner. The Absaroka-Beartooth Wilderness Area bounds the District to the north and east. To the south of the District is the Montana-Wyoming state line. The District lies entirely within Park County, Montana.

The communities of Cooke City and Silver Gate, Montana are the only population centers near the District. The neighboring communities of Mammoth, Wyoming and Gardiner, Montana are located about 80 kilometers (50 miles) to the west. Red Lodge, Montana is about 105 kilometers (65 miles) to the northeast, via the Beartooth Highway, and Cody, Wyoming is located 100 kilometers (60 miles) to the southeast. Only two routes of travel are open on a year-round basis to the District: the Chief Joseph Highway, which allows access to within a few miles of the District in the wintertime, and the highway between Mammoth and Cooke City. The Beartooth Highway is closed during the winter.

The District is situated at the headwaters of three river systems, which all eventually flow into the Yellowstone River. The three tributary rivers are the Clarks Fork of the Yellowstone, the Stillwater, and the Lamar. The Lamar River flows through Yellowstone Park. The major tributary streams in the District include Daisy, Miller, Fisher, Goose, Sheep, Lady of the Lake, Republic, Woody, and Soda Butte creeks.

3. Site Characteristics

The District is located at an elevation that ranges from 2,400 meters (7,900 feet) to over 3,200 meters (10,400 feet) above sea level and covers an area of about 100 square kilometers (40 square miles). The topography of the District is mountainous, with the dominant topographic features created by glaciation. The stream valleys are U-shaped and broad while the ridges are steep, rock-covered, and narrow. Much of the District is located at or near tree line, especially where the major mining disturbances are located. The site is snow-covered for much of the year.

The Miller Creek Source Area contains metal-rich soils and mine waste deposits that are a principal source of sulfide-bearing material. When oxidized, sulfide-bearing material forms an acidic, metal-laden leachate that can be mobile in surface water and groundwater, and cause deleterious impacts to water quality. The largely unvegetated mine waste dumps in Miller Creek are a source of metals enriched sediment that can erode into Miller Creek. The Miller Creek Source Area contains 46 small, scattered mine waste dumps, 26 of which are located on District Property, and other areas of metal-rich soils and bedrock that provide a pathway for contaminant migration by erosion. Many of the mine waste dumps located in Miller Creek are located on stable valley side-slopes, and only a few occur proximal to surface water in Miller Creek. Dumps are scattered over a wide geographic area and many are difficult to access with vehicles or equipment.

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

a. Hazardous Substances

The hazardous substances as defined in section 101(14) of CERCLA found at the site include aluminum, arsenic, cadmium, copper, iron, lead, and zinc. Concentrations of hazardous substances in solid wastes and surface water are documented in the Miller Creek Response Action EE/CA (Maxim, 2003b).

b. Sampling and Analytical Data

The sampling methods used to collect the chemical data are described in the Miller Creek Response Action EE/CA prepared by Maxim Technologies under contract to the USDA Forest Service (Maxim, 2003b). Surface water, mine waste, and groundwater samples were collected in 1996 by CBMI, in 1997 and 1998 by the EPA, and in 1999, 2000, 2001, 2002, and 2003 by the USDA Forest Service. Laboratory analytical results from waste dump samples indicate that mine waste contains elevated levels of lead and zinc as compared to background concentrations. Long-term monitoring of surface water in Miller Creek shows that water quality standards for aquatic life are particularly exceeded for aluminum, copper, iron, and lead.

c. Mechanism for Past, Present, or Future Release

Waste dumps present in the Miller Creek drainage are largely unvegetated and unconfined. Runoff erodes material into Miller Creek and potentially leaches metals from these metals-enriched wastes and soils into groundwater. Several of the waste dumps are in direct contact with surface water at certain times of the year. Several adits in the drainage discharge acidic and metals-contaminated water year-round. Concentrations of aluminum, copper, iron, and lead exceed water quality standards. Total recoverable copper exceeds standards most often, usually under conditions of high or intermediate flows (much less commonly at low flow rates). Exceedances of other metals occur almost exclusively (with the exception of one zinc analysis) under very high flow conditions (greater than 30 cubic feet per second (cfs). The presence of these total recoverable metals in waters under high flow conditions suggests that metals may be transported as suspended or colloidal particles in the stream.

d. Events or Features that could Spread or Accelerate Releases

Large runoff events, particularly during the spring when twelve to twenty feet of snowpack melts off the sites presents potential conditions for increasing erosion of the dumps and disturbed soils into surface water drainages. Other physical processes that can spread or accelerate the release of metals into the environment include avalanches that cross the path of waste dumps or mineralized soil areas, severe summer thunderstorms, and use of recreational vehicles on unvegetated dumps and in mineralized soil areas.

e. Properties that Influence the Rate of Releases

The conceptual model presented in the Miller Creek EE/CA (Maxim, 2003b) illustrates that the principal mechanisms of transport of contaminants within Miller Creek include the following:

- Physical erosion, transport, and deposition of materials by runoff and surface water.
- Dissolution of contaminants into surface runoff from primary mineralization or secondary sedimentary deposits.
- Infiltration of runoff containing dissolved metals into soil and groundwater.
- Movement of impacted water through open underground mine workings and improperly abandoned exploratory borings.
- Contaminated groundwater discharge into surface water.
- Contaminated surface water inflow to groundwater.

- Precipitation of iron and aluminum mineral phases with adsorption and deposition of trace metals as ferricrete deposits along Miller Creek's flow path.
- Scouring of secondary minerals and remobilization of metals.

Physical erosion of materials occurs where waste rock, metal-rich soils, or roadbed material is exposed at the surface, such as at mine dumps at the mouth of the Little Daisy, Alice E., Black Warrior, and Miller Mountain mines. Surface runoff carries metal-laden sediments to stream channels, where sediments are entrained in the bed load of the stream. Mobility of metals in the streambed is dependent on the chemistry of water in the stream.

5. National Priority List (NPL) Status

CERCLA, sometimes referred to as the "Superfund" statute, was enacted in 1980 to address sites where releases of hazardous substances pose a threat to public health or the environment. Under CERCLA, the nation's most contaminated sites are placed on the National Priorities List (NPL) by the EPA. No mine sites in the District are listed or have been proposed for listing on the NPL by the EPA or the Montana Department of Environmental Quality (MDEQ) because, to date, hazard ranking evaluations of the worst sites in the District do not result in a hazard score warranting listing.

6. Maps, Pictures, and other Graphic Representations

A location map and map of site features are displayed in the attached Final EE/CA (Maxim, 2003b).

B. Other Actions to Date

1. Previous Actions

On August 12, 1996, the United States signed a Settlement Agreement with CBMI to purchase CBMI's holdings in the District. The resulting transfer of property to the U.S. government effectively ended CBMI's proposed mine development plans and provided $22.5 million to cleanup historic mining impacts to specific properties in the District. In June 1998, a Consent Decree, which was signed by all interested parties and CBMI and approved by the United States District Court, finalized the terms of the Settlement Agreement and formalized the process by which funds would be made available for mine cleanup.

Mitigation of historic mining wastes has been an on-going interest of numerous parties since the 1970s. One of the first to investigate revegetation in the District was the USDA Forest Service Intermountain Research Station (Brown, 1994; 1995). This research has focused on reclamation of high elevation mine disturbances, with the bulk of the research focused on the wastes present in the McLaren Pit and the Como Basin. Larger scale reclamation efforts were conducted by CBMI as part of exploration and proposed mine development work. These activities were begun in 1993, and included reclamation work at the McLaren Pit in the Daisy Creek drainage, at the Como Basin in the Fisher Creek drainage, and at the Glengarry Mine, which is also located in the Fisher Creek drainage. From 1993 to 1996, CBMI also reclaimed a number of exploration roads and drill pads, including numerous roads on the west flank of Henderson Mountain, which is located in the Miller Creek drainage.

In March 1999, the USDA Forest Service initiated the planning process for overall project cleanup. Planning documents were in place in June 1999, and work was begun on the project with the monitoring

of surface water and groundwater quality at selected monitoring points. Activities conducted in 1999 included the following:

- Establishing a database management system for the project.
- Cataloging existing information available for the site.
- Completing a technical evaluation of existing information and data.
- Improving portions of Daisy Pass and Lulu Pass roads to accommodate construction traffic.
- Improving a previously constructed surface water diversion around the Como Shaft.
- Developing a suitable map base of District Property to support engineering design.
- Evaluating areas of erosion contributing excessive sediment to area drainages.
- Completing a repository siting evaluation report and collecting hydrogeologic data on two prospective repository sites.
- Completion by the U.S. Geological Survey of a surface water tracer study on Fisher Creek to determine surface water inputs.
- Obtaining data to fill identified data gaps for proposed Response Actions at the site.
- Identifying unrecorded mine waste dumps, adits, and boreholes, and developing a database of site characteristics.
- Ranking mine waste sources according to a modified Hazard Ranking System to aid in the prioritization of sites slated for cleanup.
- Identifying unrecorded cultural features.
- Determining the feasibility of reopening the Glengarry Adit.
- Evaluating water quality treatment alternatives for acid mine discharges.
- Preparing the Selective Source Response Action EE/CA.

Cleanup and Response Actions were continued in 2000 and 2001, with construction of the first Response Action (Selective Source Response Action) initiated in 2001. This cleanup work involved removing mine waste from nine sites in the Fisher Creek and Soda Butte Creek drainages, and disposing of these mine wastes in a constructed, central, on-site mine waste repository. Other cleanup activities conducted during 2000 and 2001 included the following:

- Maintaining community relations.
- Maintaining the project database and the project Web site.
- Preparing annual work plans.
- Continuing long-term monitoring of surface water, groundwater, and revegetated areas in the District.
- Completing the repository siting evaluation.
- Evaluating mass loading of metals from specific source areas to assist in the overall evaluation of potential response actions.

- Completing the hydrologic and geologic evaluation of the McLaren Pit, Como Basin, and Glengarry Adit source areas. This work involved reviewing historic mine maps, analyzing groundwater and surface water samples, measuring infiltration, analyzing pore water samples, and evaluating geochemical and hydrologic models that used the data to describe interactions between surface water and groundwater resources and mine wastes.
- Reopening the Glengarry Adit to assess the feasibility of potential response actions directed at reducing the input of acid mine drainage emanating from the adit.
- Reopening the Spalding and McLaren adits to determine the source and nature of water flows produced in the underground workings.
- Evaluating erosion control measures in the Como Basin.
- Completion by the U.S. Geological Survey of a surface water tracer study on Daisy Creek and Miller Creek.
- Identifying mine waste dumps, adits, and boreholes within the District.
- Completing road improvements initiated in 1999 and installing a bridge across Fisher Creek and Polar Star Creek
- Preparing the McLaren Adit Response Action EE/CA and construction package.
- Preparing the Como Basin/Glengarry Adit/Fisher Creek Response Action EE/CA.
- Reopening and rehabilitating the Como raises from the Glengarry Mine.
- Obtaining data to fill identified data gaps for proposed Response Actions at the site.

Other cleanup and investigative work continued in 2002, including the completion of assessment work in the Glengarry Adit, the Como raise, and the McLaren Adit. Reclamation construction work was begun in the McLaren Pit, with the consolidation of mine waste in the pit, reduction of slopes, and construction of runon and runoff controls. A summary of other response and restoration activities includes the following:

- Maintaining community relations.
- Maintaining the project database and the project Web site.
- Preparing the 2002/2003 annual work plan.
- Continuing long-term monitoring of surface water and groundwater.
- Completing construction of the Selective Source Response Action mine waste repository.
- Reopening the McLaren Adit.
- Conducting a study of ferricrete deposits in Fisher Creek.
- Obtaining data to fill identified data gaps for proposed Response Actions at the site.

In 2003, response action work was completed at the McLaren Pit, and construction of the Glengarry Adit closure was initiated. The 2003/2004 Work Plan was finalized, and investigations at specific sites in the District were planned and implemented.

2. Current Actions

The USDA Forest Service released a Draft EE/CA for the Miller Creek Response Action on June 13, 2003. A copy of the draft version of the EE/CA was placed in information repositories in Cooke City (Chamber of Commerce), Gardiner (Gardiner Ranger District Office), and Bozeman (Gallatin National Forest Supervisor's Office). A public notice appeared in the Bozeman Chronicle, Livingston Enterprise, Cody Enterprise, and Powell Tribune announcing that the draft EE/CA was available, setting the time for the comment period, and listing the location of the information repositories. A comment period was established, allowing comments to be made over a 78-day period, and the comment period was closed at the end of August 2003. Written comments on the public draft were received from two environmental groups, the Beartooth Alliance and the Greater Yellowstone Coalition. A response to comments received is included in the Final EE/CA, which is attached to this Action Memorandum.

C. State and Local Authorities' Role

1. State and Local Actions to Date

The USDA Forest Service has been cooperating throughout the project with the states of Montana and Wyoming, the United States Environmental Protection Agency, the United States Department of Interior, and the local county commissioners. The cooperating agencies have reviewed the various project documents and have provided comments to the USDA Forest Service.

2. Potential for Continued State/Local Response

Neither the State nor local authorities have the resources to conduct a Response Action at this time. State and local constituents will continue to be involved in site activities and will be kept apprised of all activities of this Response Action.

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

The EE/CA indicates there is a threat to public health or welfare, or to the environment as set forth in the National Contingency Plan (NCP) at 40 CFR 300.415(b)(2). Briefly, this threat is the risk of continued and future metals contamination of surrounding lands, surface water, and groundwater in Miller Creek.

Due to the concentrations of metals in mine waste sources (Maxim, 2003b), conditions at these sources meet the criteria for initiating a Response Action under 40 CFR 300.415(b)(2) of the NCP. The following factors from 40 CFR 300.415(b)(2) of the NCP form the basis for USDA Forest Service'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;

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

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

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

(v) The unavailability of other appropriate federal or state response mechanisms to respond to the release.

A. Threats to Public Health or Welfare

Heavy metals associated with the Miller Creek waste rock sources can affect human health through inhalation or ingestion. The total hazard quotient for lead and zinc present in the Miller Creek mine dumps exceed 1.0, indicating that these contaminants pose a human health risk. The total hazard quotient for lead is attributed to the risk posed by ingestion or inhalation of soil and dust. The total hazard quotient for zinc is attributed to the risk posed by ingestion of fish taken from the stream by recreationists. Because there are few fish in Miller Creek at the present time, this risk of exposure to zinc in surface water is currently not a pathway at this site. Therefore, based on these data, only lead appears to present a risk to human health via ingestion or inhalation. The risk of lead exposure in Miller Creek is restricted to waste rock that is present at the Black Warrior Mine. None of the other waste rock dumps in Miller Creek exceed guidelines for human exposure to lead.

B. Threats to the Environment

Two groups of ecological receptors have been identified as potentially being affected by contamination associated with historic mining present in the District. The first group includes aquatic life and wetlands. The second group of receptors is native terrestrial plants at the site whose ability to grow in soil or mine waste is limited by relatively high concentrations of certain metals.

The pathways by which ecological receptors could become exposed to contaminants at the site are through direct contact with soils, ingestion of contaminated soils, direct contact with water and sediments, ingestion of water and sediments, and ingestion of contaminated food. Miller Creek has been impacted by elevated heavy metals concentrations (principally aluminum, arsenic, cadmium, copper, lead, and zinc). A comparison of metals levels measured in mine waste samples collected from selected dumps to literature guidelines and state aquatic water quality standards indicate that aluminum, cadmium, copper, and lead are the contaminants that pose a risk to organisms in the aquatic environment. Concentrations of arsenic, cadmium, copper, lead, and zinc appear at phytotoxic levels in waste dumps, although no site-specific studies of metals concentrations in vegetation growing on reclaimed or abandoned mine wastes in the District have been done to determine if grazing animals would be at risk by consumption of plants that become established on mining wastes.

Another source of metals contaminants that threaten the environment are areas of anomalous metal enrichment in natural soils that are crossed by roads in Miller Creek. Large areas of anomalous soils with copper values greater than as 300 parts per million (ppm) in soils have been identified along the west flank of Henderson Mountain. These areas of anomalously high metal concentrations in soils represent a significant source of metals that could be carried in surface runoff, particularly in areas where soils have been disturbed by road building and on-going road maintenance.

IV. ENDANGERMENT DETERMINATION

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

V. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed Action Description

The preferred alternative for the Miller Creek Response Action uses a combination of alternatives evaluated in the EE/CA. Because of the nominal nature of recognized impacts from mine waste dumps in Miller Creek, the preferred alternative for the Miller Creek Source Area is a combination of best available technologies applied to five mine waste dump sites and no action at the remaining 41 dump sites. Three waste dumps are located proximal to Miller Creek (Miller Creek Dumps One and Two, and Lower Miller Creek Dump One), and are believed to contribute sediment directly to Miller Creek. For these dumps, the preferred alternative will implement in-situ technologies and surface controls to minimize direct contact with surface water. Work at these dumps involves the following activities:

- *Minor Road Improvements*: Existing roads to the three dump sites are adequate for equipment access with some minor improvements. Access to Miller Creek Dump One will require crossing Miller Creek with equipment, but a low water crossing should be adequate for regrading and lime amendment work needed to prevent direct contact of the dump material with Miller Creek.
- *Site Preparation:* This item includes clearing and grubbing, separating combustible and non-combustible debris, and debris disposal from waste surfaces and adjacent areas. Combustible debris will be burned on-site and non-combustible debris will be disposed in a licensed landfill.
- *Regrade Waste Dumps:* Mine waste dumps would be regraded to a stable configuration as allowed by site constraints in order to minimize surface erosion. Wastes in contact with surface water would be pulled back so that the wastes are out of the surface water course. Regrading would be done to blend in with the surrounding topography.
- *Surface controls:* Surface controls would be implemented at those dumps where run-on and runoff move through mine waste or other disturbed areas. Surface controls include diversion of surface water, minor grading, and erosion control measures such as straw bales or silt fence
- *Treat Waste with Neutralizing Amendment:* A neutralizing amendment, such as agricultural limestone, lime kiln dust, or calcium oxide would be mixed into the top 30 cm (1 foot) of waste. The estimated total lime required to amend mine waste is about 15 metric tons.
- *Revegetate Waste Dump Sites*: After neutralization, the regraded dumps would be amended with compost, fertilized, seeded, and covered with erosion control mat.

For the two largest dumps in the Miller Creek drainage, the Black Warrior and Little Daisy, total removal of the dumps to the Selective Source repository is preferred. Total removal involves the following activities:

- *Minor Road Improvements*: Existing roads to the Black Warrior and Little Daisy would require only modest upgrades to accommodate excavation and haul equipment. A short section of new road would be needed to access the Black Warrior.
- *Site Preparation:* This activity includes clearing and grubbing, separating combustible and non-combustible debris, and debris disposal. Combustible debris will be burned on-site and non-combustible debris will be disposed in a licensed landfill.

- E*xcavate/Load Waste:* Excavate and load all waste at the two dumps. Assuming a swell factor of about 15%, a total of 1,290 cubic meters (1,690 cy) of mine waste would be excavated and loaded onto haul trucks.
- *Construct Repository:* The Selective Source repository would be expanded to accept the additional volume of mine waste. This action would likely be coordinated with other removals planned for the District, such as the removal of the Glengarry and Gold Dust dumps, which is currently scheduled for 2005. Expanding the repository would involve the following:

  - Salvaging soil from the disturbed area.
  - Excavating the area to a design depth of 1 m (3 feet) and stockpiling excavated materials.
  - Preparing the subgrade of the repository by compacting to a specified density.
  - Constructing run-on and runoff control ditches around the perimeter of the repository.
  - Constructing a perimeter drainage trench to intercept subsurface flow.
  - Blasting rock from a nearby source to provide material for a rock toe.
  - Crushing rock from a nearby source to provide sand and gravel or importing this material from an off-site source.
  - Extending the bottom liner of the existing repository footprint to cover the expanded repository footprint.
  - Constructing a multilayered cover on top of the waste that includes a geosynthetic liner, a geocomposite liner, a drainage system, and soil layer.
  - Revegetating the repository cap with an appropriate seed mix and mulch.
  - Covering the cap with an erosion control blanket.

- *Haul Waste to Repository:* Truck wastes to the on-site repository and place and compact waste.
- *Regrade and Revegetate Mine Waste Dump Sites:* Regrade excavated areas; amend excavated surface with lime and fertilizer, seed, mulch, and cover with an erosion control blanket.

In addition to the work proposed at the five dumps in Miller Creek, the EE/CA examined restoration actions related to sediment contamination to surface waters derived from roadways. As roadways are considered to produce a majority of man-caused sediment from metals-rich areas, three different treatments are proposed to reduce sediment. The following three types of treatment would be implemented on select sections of roads in Miller Creek, as well as roads throughout the District:

Type 1 *Road closure; including either recontouring or obliteration (ripping in place), followed by seed and fertilizer application, and installation of erosion blankets.*

Type 2 *These roads would remain open and are a combination of Type 2 and Type 3 roads proposed in the Draft EE/CA. Type 2 roads (Figure ES-1 in Final EE/CA) are defined by the USDA-FS as Maintenance Level 2 according to the Forest Service Handbook 7709 (Transportation System Maintenance Handbook, Washington Office Amendment 7709.58-95-1, Effective 7/28/95).*

Type 2 is assigned to roads open for use by high clearance vehicles. Passenger car traffic is not a consideration. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Log haul may occur at this level. Appropriate traffic management strategies are either to (1) discourage or prohibit passenger cars or (2) accept or discourage high clearance vehicles. Road work consists of drainage and turnpike construction in low-lying road sections with spot surfacing. (Turnpike

construction is a descriptive engineering term for roadwork where drainage relief is provided for standing water problems along low-lying areas).

Type 5 *These roads would remain open and are assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. Type 5 roads (Figure ES-1 in Final EE/CA) are defined by the USDA-FS as Maintenance Level 3 according to the Forest Service Handbook 7709. User comfort and convenience are not considered priorities. Roads in this maintenance level are typically low speed, single lane with turnouts and spot surfacing. Some roads may be fully surfaced with either native or processed material. Appropriate traffic management strategies are either "encourage" or "accept." "Discourage" or "prohibit" strategies may be employed for certain classes of vehicles or users. Road work would consist of improvements that would include drainage, constructing ditches, installing culverts and/or rock check dams or other sediment control structures. Cut and fill slopes would be revegetated.*

Table 1 summarizes the amount and type of road rehabilitation treatment that will be implemented as part of the preferred action. A map showing the proposed treatment type for each road segment is included in the Final EE/CA.

TABLE 1
ROAD LENGTH BY REHABILITATION TYPE
New World District Response and Restoration Project

Road Rehab Type	Road Length (kilometers)						
	Daisy Creek	Fisher Creek	Miller Creek	Soda Butte Creek	Still-Water Creek	Rose Bud Creek	Total
1	0.883	2.130	1.062	0.727	0.0	0.0	4.802
2	2.747	4.788	6.903	3.203	0.0	0.0	17.641
5	2.100	0.083	3.798	0.0	0.0	0.0	5.981
Total	**5.73**	**7.001**	**11.763**	**3.93**	**0.0**	**0.0**	**28.424**

Another source of sediment will also be addressed under the road restoration portion of the work – reconstruction of the pack trail that accesses the Lake Abundance Road from Daisy Pass. This restoration work will involve relocating the steep section of this trail that drops from Daisy Pass down to Daisy Creek and reclaiming the existing highly eroded section.

Finally, the preferred alternative includes work at three other sites: backfilling a shaft at the Bull-of-the Woods Pass site; cleanup of the Cumberland Dump; and, restoring wetlands at the Glengarry Adit. Work at the Cumberland Dump, which is a solid waste dump that contains trash and equipment used by historic mining activities, involves removal of trash, old barrels, and other solid waste and disposing of the waste in a licensed landfill. Work at the Glengarry Adit involves restoration work to replace damaged wetlands in front of the portal of the Glengarry Adit in Fisher Creek. These items are considered ancillary actions to the preferred alternative.

a. Address Identified Human Health and Environmental Threats

The Black Warrior is the only waste dump on District Property that poses a risk to human health that is attributed to ingestion and/or inhalation of lead contaminants. There is no identified human health risk associated with the average concentration of metals present in waste at other mine sites in Miller Creek. Removing the Black Warrior dump will eliminate human health risk from District Property in Miller Creek.

The greatest risk to the environment comes from degraded surface water and groundwater quality and its impact to aquatic life. Vegetated surfaces will reduce the potential for further erosion and migration of contaminants from source areas by stabilizing metal-rich soils, resulting in a reduction in sediment transport in Miller Creek. In-situ reclamation is protective of the environment because it reduces the direct contact of dump materials with surface water through diversion of run-on and runoff. Removal of the Black Warrior and Little Daisy dumps eliminates risks from these two dumps that make up 46% of mine waste in the drainage.

Because roads are another source of metals in the Miller Creek watershed, implementing road mitigation treatments will further reduce impacts to surface water and the environment.

b. Justification for Proposed Alternative

The USDA Forest Service has selected the preferred alternative because this alternative provides the best combination of effectiveness, implementability, and cost effectiveness of the alternatives evaluated. Except for the Black Warrior Dump, there appears to be little impact from the remaining mine waste dumps located on District Property in Miller Creek. The Black Warrior is the only human health risk identified; it contains about 22% of the total mine waste in the Miller Creek drainage on District Property. Elsewhere, environmental risks appear to be associated with mine waste that is in contact with surface water and/or groundwater.

At the Little Daisy Mine, waste rock sits at the mouth of the adit, and discharge from the adit flows through the dump. The flow continues in the subsurface beneath shallow colluvial and talus material below the mine site. This water does not obviously come to surface further downslope. Impacts to surface water from the Little Daisy Mine outflow and waste rock are not evident. This dump is comparable in size to the Black Warrior, containing about 680 cubic meters (24%) of total waste in Miller Creek on District Property. Other mine waste dumps and their associated mine sites lie topographically well above the valley bottom, in mostly dry locations, and present no risk to human health and little threat to surface or groundwater quality (except for brief periods during active precipitation or snowmelt).

Limiting in-situ reclamation to three waste dumps in Miller Creek is reasonable, as these are the only three to present a direct hazard to surface water courses in Miller Creek from District Property, while the remaining 41 mine waste sites are in higher locations further from surface water courses, or are located on non-District Property. These remaining 41 sites also have severe site constraints and severe access limitations, as most of the remaining sites are located on steep slopes that limit access with equipment.

The preferred alternative is an appropriate response to man-caused impacts related to historic mining in Miller Creek, and such an action is in accord with the Consent Decree, Settlement Agreement, and overall project objectives. Following the implementation of the preferred alternative, the reduction in loading to Miller Creek may not bring surface water in Miller Creek into compliance with established

surface water standards, although none of the alternatives considered in the EE/CA were expected to meet Montana's B-1 standards for surface water quality in Miller Creek. Although Montana B-1 water quality standards may not be met if this action is selected, this action will mitigate, in part, impacts to the environment that result from historic metal mining. As a result of removing or controlling these primary sources of mining-related metals contamination in Miller Creek, some reduction in contaminant concentrations is expected in surface water, groundwater, and new stream sediment accumulation. In addition, the preferred alternative will not inhibit the implementation of additional response actions.

c. Technical Feasibility and Probable Effectiveness

The recommended action is both technically and administratively feasible. Key project components such as equipment, materials, and construction expertise, although distant from the site, are available and would allow the implementation and successful execution of the alternative.

By implementing the proposed natural resources restoration work on roads, it is estimated that the sediment load attributed to roads can be reduced by 10% in Daisy Creek, 2% in Fisher Creek, 6.2% in Miller Creek, and 3.8% in Soda Butte Creek. The combination of dump removal and restorative road work in Miller Creek will reduce sediment by 7.7%. Almost 60% of the sediment sources in Miller Creek are attributed to natural sources. By implementing the preferred alternative, the total reduction in man-caused sediment load from roads and mining disturbances will be 46% in Daisy Creek, 43% in Fisher Creek, almost 20% in Miller Creek, and about 19% in Soda Butte Creek.

d. Further Information

No further information is needed to select the proposed action.

e. Verify Extent of Contamination

For the removal of the Black Warrior and Little Daisy waste dumps, final contours and visual observations will be used to determine when to stop excavating waste rock. Overexcavation of native material underlying the dumps will be done to ensure any leaching of metals into native soil is removed. Samples from the bottom of excavated areas will be collected and analyzed to verify that contaminant levels in native material below the waste are at acceptable concentrations.

For the three dumps that will be treated in-situ, all disturbed areas associated with the site will be treated. Disturbed areas will be regraded to blend with the surrounding native topography, amended, and revegetated.

f. Sensitive Environments

No sensitive environments are known to be proximal to the areas that will be cleaned up under this response action. No new areas will be disturbed to conduct the response action except for minor road improvements to access all the sites. All disturbances will be revegetated with native species.

g. Uncertainties

Uncertainties associated with implementing this alternative include the uncertainty involved in predicting the effectiveness of the alternative on water quality improvement. Existing studies have shown that the Black Warrior dump does directly impact Miller Creek, and removal of the dump will effectively decrease loading of metals to the creek. However, calculating the reduction in loading to Miller Creek

from treatment/removal of the other four dumps is less certain, either because of their small size (the three in-situ sites) or because of their distance from the creek (Little Daisy dump) and lack of any documented impacts to surface water quality.

h. Institutional Controls

No institutional controls are expected to be needed following the implementation of this Response Action. Temporary closure of portions of the Daisy Pass Road and Upper Connect Road may be required during construction.

i. Off-Site Disposal

Because contaminated material is being handled on-site, off-site disposal is not required.

j. Post-Removal Site Controls

Post-removal site control will be required at the dumps included in the Miller Creek Response Action. Post-removal site control will involve monitoring to identify any problems with revegetation or erosion. Water quality sampling will be conducted periodically at established stations.

k. Changes Resulting from Public Comments

The Final EE/CA (attached) presents the comments received on the internal review draft and the public draft, and provides a response to each comment. Comments received from two environmental organizations supported the selection of the preferred alternative, although there were numerous concerns regarding the proposed actions for natural resource restoration of roads in the District. Appendix A in the Final EE/CA presents a table that reproduces the comments received on the draft EE/CA, and provides specific responses to each comment.

Numerous changes were made to the preferred alternative presented in the public draft of the EE/CA based on the comments received. These changes were almost wholly related to restoration actions proposed for road work in the District. As a result of these comments, about half of the road work proposed for District roads was eliminated from the preferred alternative.

2. Short-Term Impacts

The major short-term impact to the surrounding community, residents, and wildlife involves increased vehicle traffic and temporary closures of access to some forest roads. An increase in traffic will occur during mobilization and demobilization of construction equipment. Short-term road closures in the project area may also be necessary, limiting access to the forest. Increased traffic may impact wildlife by either changing their daily migration patterns or exposing them to a higher potential for injury or death due to collisions with vehicles.

3. Contribution to Remedial Performance

The Miller Creek Response Action is one of several response actions that will be completed in the District for the New World Mining District Response and Restoration Project. The Miller Creek Response Action will address the majority of mining-related impacts in Miller Creek. In so doing, this proposed Response Action would contribute toward improving water quality in Miller Creek. Selection and construction of the preferred alternative will not prevent or inhibit any further response actions

that may need to be taken in Miller Creek to meet the terms and intent of the Settlement Agreement and Consent Decree.

4. Description of Alternative Technologies

Removal technologies and process options potentially capable of achieving response action objectives and goals for the Miller Creek watershed were screened in the Miller Creek Response Action EE/CA (Maxim, 2003b). These technologies included no action, institutional controls, engineering controls, excavation and treatment, and in-situ treatment.

a. Institutional Controls

Institutional controls include land use and access restrictions. Institutional controls by themselves will not prevent migration of the contaminants off-site through groundwater, surface water, or air. Therefore, institutional controls as a separate alternative were not considered. However, institutional controls as components of other alternatives were considered.

b. Engineering Controls

Engineering controls limit the release or threat of release of hazardous substances generally by limiting mobility through isolation, and/or by limiting physical processes necessary for mobility. These measures included removal, in-situ containment, surface controls, and chemical fixation. These measures were incorporated into alternatives considered in the EE/CA for mine waste and natural sources.

c. Waste Disposal

Waste disposal options were considered for the waste rock dumps in Miller Creek. Waste disposal is used as a source control measure by placing contaminated media in an engineered, controlled environment. Waste control measures evaluated for Miller Creek waste dumps included in-situ amendment and removal to an on-site, engineered repository.

d. Miscellaneous Alternatives

Technology types and process options were screened to eliminate those technologies that are obviously unfeasible, while retaining potentially effective options. General response actions and process options were applied to the mitigation of contaminants in the source areas in Miller Creek. An evaluation of surface water and groundwater treatment was not conducted because source control technologies are considered the first step in cleaning up mining-related impacts. Water treatment technologies may be considered at a future time. Removal of waste rock at the Black Warrior and Little Daisy, and in-situ treatment of wastes at dumps in contact with surface water presumes that some reduction in contaminant concentrations will occur in surface water, groundwater, and streambed sediments as a result of removing or controlling the primary sources of contamination.

Various response actions and technology types were evaluated but rejected due to a variety of reasons including uncertainties in effectiveness and high cost. These response actions included: physical/chemical treatments to separate contaminants from soil, thermal treatments to either vaporize or immobilize contaminants, reprocessing metals-rich materials to recover a portion of the metals present, and off-site disposal.

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

An EE/CA that details site characteristics and identifies and develops alternatives was prepared. The USDA Forest Service interdisciplinary team and specialists from the cooperating agencies analyzed the effects of the alternatives identified in the EE/CA, and considered public comments. The Forest Service then selected a preferred alternative. A copy of the Final EE/CA is attached (Maxim, 2003b).

6. Applicable or Relevant and Appropriate Requirements (ARARs)

Section 300.415(i) of the National Contingency Plan (NCP) and guidance issued by the EPA require that removal actions attain Applicable or Relevant and Appropriate Requirements (ARARs) under federal or state environmental laws or facility siting laws, to the extent practicable considering the urgency of the situation and the scope of the removal (EPA, 1993). In addition to ARARs, the lead Agency may identify other federal or state advisories, criteria, or guidance to be considered for a particular release. ARARs were identified in the Miller Creek Response Action EE/CA.

ARARs are either applicable or relevant and appropriate. Applicable requirements are those standards, requirements, criteria, or limitations promulgated under federal or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, or contaminant found at a site and would apply in the absence of a CERCLA cleanup. Relevant and appropriate requirements are those standards, requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that are not applicable to a particular situation but apply to similar problems or situations, and therefore may be well suited requirements for a response action to address.

ARARs are divided into contaminant specific, location specific, and action specific requirements. Contaminant specific ARARs are listed according to specific media and govern the release to the environment of specific chemical compounds or materials possessing certain chemical or physical characteristics. Contaminant specific ARARs generally set health or risk based numerical values or methodologies which, when applied to site-specific conditions, result in the establishment of numerical values. These values establish the acceptable amount or concentration of a chemical that may be found in, or discharged to, the ambient environment.

Location specific ARARs are restrictions placed on the concentration of hazardous substances or the conduct of cleanup activities because they are in specific locations. Location specific ARARs generally relate to the geographic location or physical characteristics or setting of the site, rather than to the nature of the site contaminants.

Action specific ARARs are usually technology or activity based requirements or limitations on actions taken with respect to hazardous substances.

Only the substantive portions of the requirements are ARARs. Administrative requirements are not ARARs and do not apply to actions conducted entirely on-site. Provisions of statutes or regulations that contain general goals expressing legislative intent but are non-binding are not ARARs. In addition, in instances like the present case where the cleanup is proceeding in stages, a particular phase of the remedy may not comply with all ARARs, so long as the overall remedy does meet ARARs.

Under Section 121 of CERCLA, 42 U.S.C. §9621, only those state standards that are more stringent than any federal standard are considered to be an ARAR provided that these standards are identified by the state in a timely manner. To be an ARAR, a state standard must be "promulgated," which means that the standards are of general applicability and are legally enforceable. The State of Montana ARARs

set forth below have been identified in cooperation with, and with assistance from, the State of Montana Department of Environmental Quality.

a. Federal Contaminant Specific Requirements

Groundwater Standards - Safe Drinking Water Act (Relevant and Appropriate)

The National Primary Drinking Water Standards (40 CFR Part 141), are not applicable to the Miller Creek Response Action because the aquifer underlying the area is not a current public water system, as defined in the Safe Drinking Water Act, 42 U.S.C. § 300f(4). These standards are relevant and appropriate standards, however, because groundwater in the area is a potential source of drinking water. In addition, because groundwater discharges to District tributaries that may be a source of drinking water, these standards are relevant and appropriate. Maximum contaminant levels (MCLs) and maximum contaminant level goals (MCLGs) are standards promulgated pursuant to both federal and state law. No State water quality standard is more stringent than the corresponding federal MCL.

Groundwater quality in the Miller Creek drainage has been measured in only three wells and varies considerably. The two wells located in the upper Miller Creek drainage (MW-5P, a bedrock well; and 5A, an alluvial well), are in compliance with groundwater quality standards in both the shallow alluvial aquifer and the bedrock well completed in the Wolsey Shale in the Crown Butte Fault Zone. The other well (MW-6) is located immediately down gradient of the Alice E Pit and dump complex and exceeds the standards for arsenic, cadmium, lead, and manganese (one sample event only). Removal of mine waste dumps and sediment control from roadways will likely have no effect on groundwater. The Alice E Pit and waste rock dumps are located on private land and because of this are not considered for reclamation activities in this EECA, and therefore there will be no significant change in degraded groundwater quality immediately below this mine site.

Surface Water - Ambient Standards and Point Source Discharges.

While CERCLA and the NCP provide that federal water pollution criteria are the usual surface water standards to be used as relevant and appropriate standards for removal action cleanups, the State of Montana has promulgated surface water quality standards pursuant to the State of Montana Water Quality Act that are as or more stringent than the federal standards. The State of Montana has designated uses for District tributaries as B-1 and has promulgated specific standards accordingly. Discussions of these standards are included in the State of Montana ARARs discussion.

Air Standards - Clean Air Act (Applicable)

Limitations on air emissions resulting from cleanup activities or emissions resulting from wind erosion of exposed hazardous substances are described in the federal action specific requirements.

b. Federal Location Specific Requirements

The National Historic Preservation Act (Applicable)

This statute and implementing regulations (16 U.S.C. § 470, 40 CFR § 6.310(b), 36 CFR Part 800) require federal agencies or federal projects 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, the National Register of Historic Places.

Compliance with this ARAR is being met through identifying cultural and historic sites and consultation with the Montana State Historic Preservation Office (SHPO). Cultural and historic data collected during the mining company permit application were mapped and reviewed in detail by USDA Forest Service archaeologists. The USDA Forest Service has drafted a Memorandum of Agreement (Agreement) with SHPO that outlines the steps involved with historic resource delineation and protection.

Impacts to historic features associated with the Miller Creek Response Action are limited to removing and covering mine dumps. Where proposed cleanup actions impact historic or cultural resources, mitigation measures will be taken in accordance with the Agreement. These mitigating measures will be considered for the District as a whole as response actions are initiated. If unknown or undocumented historic properties are discovered during the response action, construction will be halted in the immediate area of the discovery and a USDA Forest Service archeologist will be notified.

Archaeological and Historic Preservation Act (Applicable)

This statute and implementing regulations (16 U.S.C. § 469, 40 CFR § 6.301(c)) establish requirements for evaluation and preservation of historical and archaeological data, including Indian cultural and historical resources, which may be destroyed through alteration of terrain as a result of federal construction projects or a federally licensed activity or program. If eligible scientific, prehistorical, or archaeological data are discovered during site activities, these resources will be preserved in accordance with these requirements. The procedure for addressing such discoveries is described under the previous National Historic Preservation Act discussion.

Historic Sites, Buildings, and Antiquities Act (Applicable)

This requirement states that "in conducting an environmental review of a proposed EPA action, the responsible official shall consider the existence and location of natural landmarks using information provided by the National Park Service pursuant to 36 CFR § 62.6(d) to avoid undesirable impacts upon such landmarks. Those activities described for the National Historic Preservation Act provide procedures to comply with this ARAR.

Fish and Wildlife Coordination Act (Applicable)

These standards (16 U.S.C. §§ 661 et seq. and 40 CFR § 6.302(g)) require that federally funded or authorized projects ensure that any modification of any stream or other water body affected by a funded or authorized action provide for adequate protection of fish and wildlife resources. The USDA Forest Service is involved with discussions with the U.S. Fish and Wildlife Service (USFWS) and the State of Montana Department of Fish, Wildlife, and Parks (FWP) to comply with this ARAR.

Floodplain Management Order (Relevant and Appropriate)

This requirement (40 CFR Part 6, Appendix A, Executive Order No. 11,988) mandates that federally funded or authorized actions within the 100 year flood plain avoid, to the maximum extent possible, adverse impacts associated with development of a floodplain. Compliance with this requirement is detailed in EPA's August 6, 1985 "Policy on Floodplains and Wetlands Assessments for CERCLA Actions." The Floodplain and Floodway Management Act does not directly apply because the waste dumps in Miller Creek included for cleanup are not in a designated 100-year floodplain. However, as some wastes will be removed or treated in the Miller Creek floodplain, cleanup activities will comply with the substantive portions of this order.

Protection of Wetlands Order (Applicable)

This requirement (40 CFR Part 6, Appendix A, Executive Order No. 11,990) mandates that federal agencies avoid, to the extent possible, adverse impacts associated with the destruction or loss of wetlands. The order also provides that activities avoid construction in wetlands if a practicable alternative exists. Section 404(b)(1), 33 U.S.C. § 1344(b)(1) prohibits discharge of dredged or fill material into waters of the United States. The only wetlands that may be impacted by the proposed Response Action are areas immediately adjacent to the toes of the Black Warrior and Miller Creek Dump 1 sites. These areas will be avoided to the extent possible during construction and by reclaiming the excavated waste dump areas with suitable materials that do not adversely impact adjacent wetlands.

The Endangered Species Act (Applicable)

This statute and implementing regulations (16 U.S.C. §§ 1531 - 1543, 50 CFR Part 402, and 40 CFR § 6.302(h)) require that any federal activity or federally authorized activity may not jeopardize the continued existence of any threatened or endangered species or destroy or adversely modify a critical habitat.

Threatened and endangered species are present in or near the District. The U.S. Fish and Wildlife Service has identified the grizzly bear, bald eagle, Canada lynx, and gray wolf as threatened and endangered species that may be present in the project area. No critical habitat was designated or proposed in the project area, although the District lies within the Grizzly Bear Recovery Zone for the Yellowstone area. Long-term impacts to threatened and endangered species from the proposed action are not expected, although risk to grizzly bear mortality may be higher due to the increased use of the area. Also, displacement of wildlife species such as the grizzly bear may be increased by reclamation activities in the short-term.

Although construction and implementation of the alternative will require an increased level of activity, long-term maintenance will not require a level of activity that is greater than that existing under current conditions. In the long term, mitigation of mining-related water quality impacts in the District should serve to enhance wildlife habitat by removing contaminants from the environment. The overall impact of response and restoration activities is neutral to beneficial to wildlife, although road improvements that are being done over the life of the project could have long-term impacts on wildlife due to increased traffic, increased traffic speeds, and increased use of the area.

Migratory Bird Treaty Act (Applicable)

This requirement (16 U.S.C. §§ 703 et seq.) establishes a federal responsibility for the protection of the international migratory bird resource and requires continued consultation with the USFWS during design and construction to ensure that cleanup does not unnecessarily impact migratory birds. The USDA Forest Service is involved with discussions with the USFWS to comply with this requirement, and measures will be taken to mitigate removal activities if adverse impacts are identified. The reclamation process will attempt to restore habitat and should have a long-term neutral to beneficial effect on migratory bird species, while reclamation activities may have a short-term disturbance or displacement effect on migratory bird species.

Bald and Golden Eagle Protection Act (Applicable)

This requirement (16 U.S.C. §§ 668 et seq.) establishes a federal responsibility for protection of bald and golden eagles, and requires continued consultation with the USFWS during design and construction to

ensure that any cleanup of the site does not unnecessarily adversely affect the bald and golden eagle. The USDA Forest Service is involved with discussions with USFWS to comply with this requirement, and measures would be taken to mitigate removal activities if adverse affects are identified. Bald eagles do not nest in the area, although golden eagles may nest in the project area. Both species may pass through the area to forage or during migration. The project is unlikely to have adverse effects on these species. Overall, impact of mining reclamation should be neutral to beneficial for most wildlife species, while disturbance associated with reclamation will be short-term for most bird species.

c. Federal Action Specific Requirements

RCRA Requirements (Relevant and Appropriate)

RCRA hazardous waste requirements are not applicable to District Property wastes in accordance with 40 CFR § 261.4(b)(7) (the Bevill exemption). In addition, many RCRA regulations are not applicable because this removal action consolidates mining wastes from two waste dumps and places these wastes into an existing on-site repository. Nevertheless, certain RCRA hazardous waste regulations (which are identical to state hazardous waste regulations) concerning covering waste piles and runon/runoff controls have been determined to be relevant and appropriate in the handling of these wastes. The following regulations are relevant and appropriate:

- RCRA regulations found at 40 CFR §§ 264.310(a), and (b)(1), and (5) (regarding final cover, run-on and run-off controls), which are identical to state solid waste regulations, are relevant and appropriate requirements for the consolidation site to be used for waste management and disposal, although the 40 CFR Part 258 standards for solid wastes provide more specific guidance.

Surface water controls at the three waste sites where in-situ treatment will be conducted will be designed to convey runon and runoff from treated areas to minimize the contact of water with wastes left in place. All run-on and runoff controls will be engineered to handle water flows that arise during spring runoff. Wastes removed to the on-site repository will be incorporated into existing runon and runoff controls that were constructed at the repository for the Selective Source Response Action.

Solid Waste Requirements (Relevant and Appropriate)

The Federal solid waste regulations found at 40 CFR Part 258 are not applicable because they apply to municipal solid waste landfill units (MSWLF units), which do not include the waste repository at this site. Nevertheless, the regulations in Part 258 concerning covering waste piles and run-on/run-off controls have been determined to be relevant and appropriate in the handling of these wastes. The following regulations are relevant and appropriate.

- Requirements described at 40 CFR §§ 258.60(a) and 258.61(a)(1), governing cover requirements and runon/runoff controls.

Surface Mining Control and Reclamation (Relevant and Appropriate),

Regulations promulgated under the Surface Mining Control and Reclamation Act (30 CFR, Part 816 and 784) cover reclamation requirements for coal and certain non-coal mining operations. Reclamation of the removed dump sites and treated sites will generally conform to these requirements. Revegetation requirements will follow prescriptions developed by the USDA Forest Service Rocky Mountain Research Station. These prescriptions are based on 23 years of site specific research involving reclamation of

mine wastes at high altitudes and restoration of native plant communities. Revegetation prescriptions have been designed to regenerate under the natural conditions prevailing at the site. Site specific research indicates that revegetation will be permanent, diverse, predominantly native, and of the same seasonality and utility found in similar pre-disturbance areas. Cover, planting, and stocking specifications are based on local and regional conditions.

Erosion control will be accomplished using best management practices to prevent deterioration of water quality or quantity and prevent erosion resulting from roads. Following removal, revegetated areas will be capable of supporting designated land uses, will blend with the surrounding topography, and meet slope restrictions.

Air Standards - Clean Air Act (Applicable)

The state standards, promulgated in accordance with Section 109 of the Clean Air Act, are applicable to releases into the air from removal action activities, but the national ambient air standards are not. Ambient air standards for lead are promulgated at Administrative Rules of Montana (ARM) 17.8.222 as part of a federally approved State Implementation Plan (SIP), in accordance with the Clean Air Act of Montana, §§ 75-2-101 et seq., Montana Codes Annotated (MCA). Corresponding federal regulations are 40 CFR § 50.12. The lead standard provides that no person shall cause or contribute to concentrations of lead in the ambient air that exceed 1.5 micrograms per cubic meter ($\mu g/m^3$) of air, measured over a 90-day average.

Regulations promulgated at ARM 17.8.223 as part of the SIP (§§ 75-2-101 et seq., MCA) apply to particulate matter that is 10 microns in diameter or smaller (PM-10). Corresponding federal regulations are 40 CFR § 50.6. According to this standard, no person shall cause or contribute to concentrations of PM-10 in the ambient air which exceed 150 $\mu g/m^3$ of air for a 24 hour average with no more than one expected exceedance per calendar year and 50 $\mu g/m^3$ of air on an annual average.

For the Miller Creek Response Action, sampling data indicated that lead concentrations are only present at the Black Warrior dump at levels that are high enough to be of concern to human health. However, based on field investigation data, dump materials are primarily of a grain size that is not susceptible to wind transport. Therefore, removal operations that involve excavation, loading, hauling, and placing wastes are not expected to exceed these two air quality standards. However, to ensure blowing dust is controlled, best management practices will be incorporated into the removal action as site conditions require mitigating actions.

Ambient air standards under Section 109 of the Clean Air Act are also promulgated for carbon monoxide, hydrogen sulfide, nitrogen dioxide, sulfur dioxide, and ozone. If emissions of these compounds were to occur at the site in connection with any cleanup action, these standards would also be applicable (40 CFR Part 50). Carbon monoxide, hydrogen sulfide, nitrogen dioxide, sulfur dioxide, and/or ozone are not expected to be generated during the removal action beyond those levels normally associated with internal combustion engines. Therefore, no measures will be needed to accommodate these standards.

Transportation of Hazardous or Contaminated Waste (Relevant and Appropriate)

40 CFR Part 263 establishes regulations for the transportation of hazardous waste. These regulations would govern any on-site transportation of material. No off-site transportation of wastes will occur for the Miller Creek Response Action. Transportation of waste materials will be done in such a manner as

to eliminate the spread of waste along haul roads and to immediately cleanup any spills that may occur during haul operations.

Occupational Safety and Health Act (Applicable)

Occupational Safety and Health Administration requirements will be met by requiring appropriate safety training for all on-site workers during construction phase. Site activities will be conducted under the guidance of a Health and Safety Plan for the site per OSHA 29 CFR § 1910.120. Site personnel will have completed 40-hour hazardous waste operations and emergency response training and will be current with the 8-hour annual refresher training as required by OSHA 29 CFR § 1910.120.

d. Montana Contaminant Specific Requirements

Surface Water Quality Standards (Applicable)

Under the State of Montana Water Quality Act, §§ 75-5-101 et seq., MCA, the state has promulgated regulations to protect, maintain, and improve the quality of surface waters in the state. Although the point source discharge requirements of the Act are not applicable because the Miller Creek Response Action will not create any point source discharge of contaminated water, the requirements listed below are applicable water quality standards for the Miller Creek Response Action.

The State of Montana has classified the streams in the District as B-1. The definition of B-1 waters are waters that are suitable for drinking, culinary and food processing (after conventional treatment), bathing, swimming and recreation, growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers, and agricultural and industrial water supply. The B-1 stream classification also sets forth standards for coliform bacteria, dissolved oxygen content, pH, turbidity, temperature, sediment or floating solids, color, and concentrations of toxic or harmful parameters as specified in Circular WQB-7. The state is also in the process of developing total maximum daily loads (TMDLs) for the Cooke City Planning Area. A TMDL is a pollutant budget developed at a level where water quality standards will not be exceeded. The TMDL accounts for loads from point and non-point sources in addition to natural background loads. A final Water Quality Restoration Plan for the Cooke City Planning Area was released by the DEQ on September 23, 2002.

For the Miller Creek Response Action, waste rock dumps that will be treated or removed are located in the Miller Creek watershed. Aquatic life standards are prescribed in Circular WQB-7 for surface water parameters. These standards are listed below for the contaminants of concern identified in the Miller Creek EE/CA. Where standards are based on hardness calculations, the standard has been adjusted for the average hardness in Miller Creek of 83 milligrams per liter.

Parameter	(microgram/Liter)
Aluminum	87
Cadmium	1.8
Copper	8
Iron	300
Lead	2.5
Manganese	50
Zinc	102
pH	> 6.5 and < 8.5 std. units

Additional restrictions on any discharge to surface waters are included in ARM 17.30.637 (Applicable), which prohibits discharges containing substances 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 that create a nuisance, or render undesirable tastes to fish flesh or make fish inedible;

(d) create concentrations or combinations of materials that are toxic or harmful to human, animal, plant, or aquatic life;

(e) create conditions that produce undesirable aquatic life.

ARM 17.30.1203 (relevant and appropriate) adopts and incorporates the provisions of 40 C.F.R. Part 125 for criteria and standards for the imposition of technology-based treatment requirements in MPDES permits. The permit requirement would not apply to on-site discharges because it is not substantive, and the substantive requirements of Part 125 would not be applicable because there will be no point source discharge at the site.

One applicable provision of the Act for both surface water and ground water, §75-5-605, MCA, provides that it is unlawful to cause pollution as defined in § 75-5-103 of any state waters or to place or cause to be placed any wastes where they will cause pollution of any state waters. In this instance, the selected Response Action is in compliance because it prevents future pollution of state waters, and does not cause additional pollution.

Contaminant-specific standards associated with the Montana Water Quality Act may not be achieved under the preferred alternative without further remediation as part of a subsequent cleanup phase, even when combined with sediment control from roadways, without other cleanup actions that address cleanup of natural sediment sources that include the barren slopes with anomalously high metals concentrations on the southwest flank of Henderson Mountain. Under current conditions, the exceedance of water quality standards principally occurs during high flow events (with the exception of copper), which strongly suggests that contaminants are associated with sediment transported in surface waters. Some improvement in water quality in Miller Creek is expected, however, because erosion of contaminants from the removed and treated waste dump areas would be eliminated.

Groundwater Pollution Control System (Applicable)

ARM 17.30.1006 (Applicable) classifies groundwater into Classes I through IV based on the present and future most beneficial uses of the groundwater, and states that groundwater is to be classified according to actual quality or actual use, whichever places the groundwater in a higher class. Class I is the highest quality class; Class IV the lowest. Based upon its specific conductance, the great majority of the groundwater in the District should be considered Class I groundwater.

Groundwater quality in the Miller Creek drainage has been measured in only three wells and varies considerably. The two wells located in the upper Miller Creek drainage (MW-5P, a bedrock well; and 5A, an alluvial well), are in compliance with groundwater quality standards in both the shallow alluvial

aquifer and the bedrock well completed in the Wolsey Shale in the Crown Butte Fault Zone. The other well (MW-6) is located immediately down gradient of the Alice E Pit and dump complex and exceeds the standards for arsenic, cadmium, lead, and manganese (one sample event only). Removal of mine waste dumps and sediment control from roadways will likely have no effect on groundwater. The Alice E Pit and waste rock dumps are located on private land, and, because of this, are not considered for cleanup under this Response Action.

Air Quality

In addition to the standards identified in the federal action specific ARARs above, the State of Montana has identified certain air quality standards in the action specific section of the State action specific ARARs below.

e. Montana Location Specific Requirements

Floodplain and Floodway Management Act and Regulations (Applicable)

The Floodplain and Floodway Management Act (§§ 76-5-401 et seq., MCA) and regulations specify types of uses and structures that are allowed or prohibited in the designated 100-year floodway and floodplain. While no designated 100-year floodplain will be affected by the Miller Creek Response Action, the Act and certain floodplain management regulations (ARM 36.15.602, .603, .604, .605) have been designated as applicable because excavation of the Black Warrior Dump will be conducted in the Miller Creek floodplain. Compliance with the substantive portions of the these regulations will be achieved because the dump will be removed from the floodplain, the stream channel reconstructed through the former dump area, and no permanent structures or obstructions will be placed in the floodplain.

Solid Waste Management Regulations (Applicable)

Regulations promulgated under the Solid Waste Management Act, §§ 75-10-201 et seq., MCA, specify requirements that apply to the location of any solid waste management facility. Under a previous response action in the District (Selective Source Response Action), a lined and capped on-site facility was approved and sized for disposal of mining wastes in the District (USDA-FS, 2001). The siting of the repository complied with applicable siting requirements for solid waste facilities, with the selection and approval of waste disposal in the repository based on the combination of site characteristics and the use of engineered containment materials. The analysis of the site in the Selective Source Response Action Engineering Evaluation/Cost Analysis demonstrated the adequate capacity of the site for District Property wastes, exclusive of the McLaren Pit waste rock (Maxim, 2001b).

This facility was partially constructed in 2001 and 2002, with the next expansion of the repository designed to dispose of wastes from Fisher Creek (Como Basin/Glengarry Adit/Fisher Creek Response Action) and Miller Creek (Miller Creek Response Action). The engineering design selected for the repository under the Selective Source Response Action will prevent leachate from entering the environment through the use of synthetic bottom liner and leachate collection system. There will be no point discharge from the repository. Engineering analysis of the performance of the cover and bottom liner systems predict that a very small quantity of leachate could seep through the bottom liner, but that this very small quantity would not be detectable in surface water immediately downgradient of the repository. Sufficient separation of the waste from groundwater is provided with the bottom liner and an underdrain system.

Natural Streambed and Land Preservation Standards (Applicable)

Sections 87-5-502, et seq., MCA, (Applicable -- substantive provisions only) provide that a state agency or subdivision shall not construct, modify, operate, maintain or fail to maintain any construction project or hydraulic project which may or will obstruct, damage, diminish, destroy, change, modify, or vary the natural existing shape and form of any stream or its banks or tributaries in a manner that will adversely affect any fish or game habitat. The requirement that any such project must eliminate or diminish any adverse effect on fish or game habitat is applicable to the state in approving removal actions to be conducted. The Natural Streambed and Land Preservation Act of 1975, §§ 75-7-101 et seq., MCA, (Applicable -- substantive provisions only) includes similar requirements and is applicable to private parties as well as government agencies.

ARM 36.2.410 (Applicable) establishes minimum standards which would be applicable if a removal action alters or affects a streambed, including any channel change, new diversion, riprap or other streambank protection project, jetty, new dam or reservoir or other commercial, industrial or residential development. No such project may be approved unless reasonable efforts will be made consistent with the purpose of the project to minimize the amount of stream channel alteration, insure that the project will be as permanent a solution as possible and will create a reasonably permanent and stable situation, insure that the project will pass anticipated water flows without creating harmful erosion upstream or downstream, minimize turbidity, effects on fish and aquatic habitat, and adverse effects on the natural beauty of the area and insure that streambed gravels will not be used in the project unless there is no reasonable alternative. Soils erosion and sedimentation must be kept to a minimum. Such projects must also protect the use of water for any useful or beneficial purpose. See §75-7-102, MCA.

The Natural Streambed and Land Preservation Act will be complied with by using earth and natural materials to reconstruct portions of streambanks and sufficiently protecting those locations with erosion control techniques so that the bed and banks are protected from flood erosion. Reconstructed stream segments will be designed to provide hydraulic stability. All disturbed areas will be managed during construction to minimize erosion.

f. Montana Action Specific Requirements

In the following action-specific ARARs, the nature of the action triggering applicability of the requirement is stated in parentheses as part of the heading for each requirement.

Air Quality Regulations (Applicable) (Excavation/earth-moving; transportation)

Dust suppression and control of certain substances likely to be released into the air as a result of earth moving, transportation and similar actions may be necessary to meet air quality requirements. Certain ambient air standards for specific contaminants and particulates are set forth in the federal action specific section above. Additional air quality regulations under the state Clean Air Act, §§ 75-2-101 et seq., MCA, are discussed below.

ARM 17.8.604 (Applicable) 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. Any waste which is moved from the premises where it was generated and any trade waste (material resulting from construction or operation of any business, trade, industry or demolition project) may be open burned only in accordance with the substantive requirements of 17.8.612 or 611.

No burning of waste will be conducted to complete this project.

ARM 17.8.308(1), (2), and (3) (Applicable) provides that no person shall cause or authorize the production, handling, transportation or storage of any material; or cause or authorize the use of any street, road, or parking lot; or operate a construction site or demolition project, unless reasonable precautions to control emissions of airborne particulate matter are taken. Emissions of airborne particulate matter must be controlled so that they do not "exhibit an opacity of twenty percent (20%) or greater averaged over six consecutive minutes." ARM 17.8.308(1) and (2) (Applicable) and ARM 17.8.304 (Applicable).

In addition, state law provides an ambient air quality standard for settled particulate matter. Particulate matter concentrations in the ambient air shall not exceed the following 30-day average: 10 grams per square meter. ARM 17.8.220 (Applicable).

ARM 17.8.308(4) (Relevant and Appropriate) requires that any new source of airborne particulate matter that has the potential to emit less than 100 tons per year of particulates shall apply best available control technology (BACT); any new source of airborne particulate matter that has the potential to emit more than 100 tons per year of particulates shall apply lowest achievable emission rate (LAER). The BACT and LAER standards are defined in ARM 17.8.301. Precautions will be taken during construction to limit dust emissions from removal activities.

ARM 17.24.761 (Relevant and Appropriate) specifies a range of measures for controlling fugitive dust emissions during mining and reclamation activities. Some of these measures could be considered relevant and appropriate to control fugitive dust emissions in connection with excavation, earth moving, and transportation activities conducted as part of the removal. Such measures include watering or frequently compacting and scraping roads, promptly removing rock, soil or other dust-forming debris from roads, restricting vehicle speeds, revegetating, mulching, or otherwise stabilizing the surface of areas adjoining roads, restricting unauthorized vehicle travel, minimizing the area of disturbed land, and promptly revegetating regraded lands.

Fugitive dust will be generated with earth moving activities and transportation of materials on unpaved roads. Road dust will be suppressed by the contractor through watering.

Solid Waste Regulations (Relevant and Appropriate)

State regulations concerning final cover requirements, runon/runoff controls, and monitoring that are more specific than the Federal regulations are applicable to the Response Action. To some extent these regulations are superceded by State mine reclamation regulations, which are more specific. Implementing the preferred alternative for this Response Action will comply with the requirements for final cover, runon/runoff controls, and monitoring at the Selective Source Repository. Compliance with these requirements is explained in the discussion on Reclamation Requirements (below) and the Federal Action Specific Requirements section (above).

Reclamation Requirements (Relevant and Appropriate)

The Strip and Underground Mine Reclamation Act, §§ 82-4-201 et seq., MCA, technically applies to coal and uranium mining, but that statute and the regulations promulgated under that statute and discussed in this section set out the standards that mine reclamation should attain. To the extent they are more stringent than the federal regulatory scheme contained in the Surface Mining Control and Reclamation Act (see 30 CFR Parts 789, 816), the State requirements identified here have been determined to be relevant and appropriate requirements for this action.

Section 82-4-231 (Relevant and Appropriate) requires the reclamation and revegetation of the land. In developing a method of operation and plans of backfilling, water control, grading, topsoiling and reclamation, all measures shall be taken to eliminate damages to landowners and members of the public, their real and personal property, public roads, streams, and all other public property from soil erosion, subsidence, landslides, water pollution, and hazards dangerous to life and property.

Sections 82-4-231(10)(j) and (k) and ARM 17.24.751 (Relevant and Appropriate) provide that reclamation of mine waste materials shall, to the extent possible using the best technology currently available, minimize disturbances and adverse impacts of the operation on fish, wildlife, and related environmental values and achieve enhancement of such resources where practicable, and shall avoid acid or other toxic mine drainage by such measures as preventing or removing water from contact with toxic-producing deposits.

Sections 82-4-233(Relevant and Appropriate) requires that after the operation has been backfilled, graded, topsoiled, and approved, the operator shall establish a vegetated cover on all impacted lands. ARM 17.24.641 (Relevant and Appropriate) also provides that drainage from acid-forming or toxic-forming spoil into ground and surface water must be avoided by preventing water from coming into contact with such spoil. ARM 17.24.505 (Relevant and Appropriate) similarly provides that acid, acid-forming, toxic, toxic-forming or other deleterious materials must not be buried or stored in proximity to a drainage course so as to cause or pose a threat of water pollution.

Revegetation will be an integral part of the Miller Creek Response Action. Utilizing nearly 25 years of site specific revegetation trials, the USDA Forest Service has developed revegetation prescriptions that substantially comply with all requirements of the Strip and Underground Mine Reclamation Act. Revegetation is an integral part of the removal action because vegetation protects the sites treated or removed from erosion. Disturbed areas will be revegetated in accordance with the revegetation prescriptions such that revegetation is rapid and effective.

Reclamation Activities - Hydrology Regulations (Relevant and Appropriate)

The hydrology regulations provide guidelines for addressing the hydrologic impacts of mine reclamation activities and earth moving projects and are relevant and appropriate for addressing these impacts associated with the Miller Creek Response Action.

ARM 17.24.631 (Relevant and Appropriate) provides that long-term adverse changes in the hydrologic balance from mining and reclamation activities, such as changes in water quality and quantity, and location of surface water drainage channels shall be minimized. Water pollution must be minimized and, where necessary, treatment methods utilized. Diversions of drainages to avoid contamination should be used in preference to the use of water treatment facilities. Other pollution minimization devices must be used if appropriate, including stabilizing disturbed areas through land shaping, diverting runoff, planting quickly germinating and growing stands of temporary vegetation, regulating channel velocity of water, lining drainage channels with rock or vegetation, mulching, and control of acid-forming, and toxic-forming waste materials.

ARM 17.24.633 (Relevant and Appropriate) provides that sediment controls must be maintained until the disturbed area has been restored and revegetated.

During construction of the Miller Creek Response Action, storm water controls will be in place and vegetation will be established following construction to minimize erosion. Temporary diversion

channels needed to direct stormwater runoff from the construction area would be constructed to minimize erosion.

ARM 17.24.634 (Relevant and Appropriate) provides that drainage design shall emphasize premining channel and floodplain configurations that blend with the undisturbed drainage system above and below; will meander naturally; remain in dynamic equilibrium with the system; improve unstable premining conditions, provide for floods, provide for long term stability of the landscape; and establish a premining diversity of aquatic habitats and riparian vegetation.

ARM 17.24.635 through 17.24.637 (Relevant and Appropriate) set forth requirements for temporary and permanent diversions. Temporary diversion channels will be designed in consideration of the drainage basin contributing flow to the channels. Erosion will be avoided by using rock lining.

ARM 17.24.638 (Relevant and Appropriate) specifies sediment control measures to be implemented during operations. An erosion control plan will be required that sets forth methods to control sediment during construction.

ARM 17.24.641 (Relevant and Appropriate) provides requirements for preventing drainage from acid- and toxic-forming wastes into ground and surface waters.

ARM 17.24.643 and 644 (Relevant and Appropriate) require that groundwater flow systems be protected from acid, toxic, or otherwise harmful mine drainage waters and that disturbed areas be reclaimed to restore the approximate premining recharge capacity through restoration of the capability of the reclaimed area as a whole to transmit water to the groundwater system.

ARM 17.24.650 (Relevant and Appropriate) requires that all ponds, diversions, and treatment facilities must be regraded to the approximate original contour and reclaimed.

Reclamation and Revegetation Requirements (Relevant and Appropriate)

ARM 17.24.501 (Relevant and Appropriate) set forth general backfilling and final grading requirements. Excavated areas will be backfilled to blend with the surrounding undisturbed topography. Backfill will be suitable for establishment of vegetative cover.

ARM 17.24.703 (Relevant and Appropriate). When using materials other than, or along with, soil for final surfacing in reclamation, the operator must demonstrate that the material (1) is at least as capable as the soil of supporting the approved vegetation and subsequent land use, and (2) the medium must be the best available in the area to support vegetation. Such substitutes must be used in a manner consistent with the requirements for redistribution of soil in ARM 17.24.701 and 702.

ARM 17.24.713 (Relevant and Appropriate) provides that seeding and planting of disturbed areas must be conducted during the first appropriate period for favorable planting after final seedbed preparation.

ARM 17.24.714 (Relevant and Appropriate) requires use of a mulch or cover crop or both until an adequate permanent cover can be established. Use of mulching and temporary cover may be suspended under certain conditions.

ARM 17.24.716 (Relevant and Appropriate) establishes the required method of revegetation, and provides that introduced species may be substituted for native species.

ARM 17.24.718 (Relevant and Appropriate) requires the use of soil amendments and other means such as irrigation, management, fencing, or other measures, if necessary to establish a diverse and permanent vegetative cover.

All revegetation requirements included in the above ARMs will be complied with using site specific revegetation research results. Nearly 25 years of research was conducted by the USDA Forest Service at the site, primarily through the guidance of Dr. Ray Brown, an eminent scientist stationed at the Rocky Mountain Research Station in Logan, Utah. Through his work, the USDA Forest Service has developed revegetation prescriptions that substantially comply with revegetation requirements. All disturbed areas will be revegetated in accordance with the revegetation prescriptions such that revegetation is effective, permanent, self-sustaining, and native. Soil amendments and revegetation treatments such as lime, fertilizer, mulch, erosion control blankets, and organic amendments are all included in the revegetation prescriptions.

ARM 17.24.751(Relevant and Appropriate) requires site activities be conducted to avoid or minimize impacts to important fish and wildlife species, including critical habitat and any threatened or endangered species identified at the site.

ARM 17.24.761 (Relevant and Appropriate) requires fugitive dust control measures for site preparation and reclamation operations.

g. Non-Compliance with ARARs

The preferred Response Action selected for the cleanup of mining-related impacts in the headwaters of Miller Creek will move compliance with ARARs in a positive direction. Surface water and groundwater quality is expected to improve by implementing the preferred alternative. Additional cleanup efforts will be evaluated as necessary, depending on results achieved. Implementing the preferred Response Action will not hinder further Response Actions that may be required at the site

7. Project Schedule

The Miller Creek Response Action is expected to be completed over two years. In 2004, in-situ reclamation activities would be conducted at the three sites in Miller Creek, as well as at the Cumberland site. Dump removals would be conducted in 2005 when the expansion of the Selective Source Repository is scheduled. Wetland restoration at the Glengarry dump would also be done in 2005. The engineering design for Miller Creek will be completed in early 2004 and a construction package will be advertised for bid in 2004.

Road work associated with natural resource restoration will be completed under a separate construction contract. A final decision on the timing of this work has not yet been made.

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B. Estimated Costs

Estimated costs for the Miller Creek Response Action are summarized in Table 2. The cost to remove the Black Warrior and Little Daisy dumps is $265,400, which includes road upgrades and repository construction costs. Cost of reclaiming the four selected sites in-situ is estimated to be $61,590. Adding in the ancillary items, engineering evaluation, design, post-removal site control (PRSC), and oversight, the total estimated cost to implement the preferred alternative for the Miller Creek Response Action is $ 983,800.

TABLE 2 PREFERRED ALTERNATIVE ESTIMATED COST New World Mining District Response and Restoration Project Miller Creek Response Action	
ITEM	**ESTIMATED COST**
In-situ reclamation (four sites)	**$61,590**
Removal of the Black Warrior and Little Daisy Dumps	**$265,400**
Natural Resource Restoration[(1)]	**$349,800**
Mobilization/Contingency	**$72,300**
Engineering Evaluation/Design/Oversight/PRSC	**$125,800**
TOTAL ESTIMATED COST	**$983,800**

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

If no action is taken to stabilize wastes and isolate wastes from surface water and groundwater, the site will continue to be degraded and present a risk to ecological receptors.

VII. OUTSTANDING POLICY ISSUES

None

VIII. ENFORCEMENT

Although the USDA Forest Service specifically denies any liability in this situation, it will be the "lead agency" for all response actions occurring on National Forest System Lands, as defined by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR part 300, and all response actions will be undertaken in a manner consistent with the NCP. A Consent Decree and Settlement Agreement between the United States, several signature parties, and CBMI is the legal mechanism that outlines responsibilities of the parties to the agreement, the process, and the funds that will be used for cleanup.

IX. RECOMMENDATION

This decision document represents the Miller Creek Response Action for the removal and disposal of the Black Warrior and Little Daisy waste dumps, implementing in-situ treatment at selected dumps in the Miller Creek drainage, and restoration of roads in the District and the Glengarry wetland. The project is situated in the Gardiner Ranger District of the Gallatin National Forest. This document was developed in accordance with CERCLA, as amended, and is not inconsistent with the NCP. This decision is based on the administrative record for the site. Conditions at the site meet the NCP section 300.415(b)(2) criteria for a removal and I recommend your approval of the proposed removal action.

_____ _____

Mary Beth Marks Date
On-Scene Coordinator (OSC)

I concur with the recommendation to implement the proposed alternatives as described in this Action Memorandum and attached Engineering Evaluation/Cost Analysis for the Miller Creek Response Action, New World Mining District Response and Restoration Project.

_____ _____

Ken Britton Date
District Ranger
Gardiner Ranger District

I concur with the recommendation to implement the proposed alternatives as described in this Action Memorandum and attached Engineering Evaluation/Cost Analysis for the Miller Creek Response Action, New World Mining District Response and Restoration Project.

_____ _____

Rebecca Heath Date
Forest Supervisor
Gallatin National Forest

I concur with the recommendation to implement the proposed alternatives as described in this Action Memorandum and attached Engineering Evaluation/Cost Analysis for the Miller Creek Response Action, New World Mining District Response and Restoration Project.

_____ _____

Nancy T. Curriden Date
Forest Supervisor
Custer National Forest

I concur with the recommendation to implement the proposed alternatives as described in this Action Memorandum and attached Engineering Evaluation/Cost Analysis for the Miller Creek Response Action, New World Mining District Response and Restoration Project.

_____ _____

Bob Kirkpatrick Date
USDA Project Coordinator
Northern Region

I approve of the proposed removal action as outlined in the Action Memorandum and attached Engineering Evaluation/Cost Analysis for the Miller Creek Response Action, New World Mining District Response and Restoration Project.

_____ _____

Abigail R. Kimbell Date
Regional Forester
Northern Region