New World Mining District Response and Restoration Project

PROJECT SUMMARY 2003

United States Department of Agriculture
Forest Service
Northern Region
Gallatin National Forest

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PROJECT SUMMARY
2003
NEW WORLD MINING DISTRICT
RESPONSE AND RESTORATION PROJECT

Prepared for:

USDA Forest Service
Northern Region
Missoula, Montana

Prepared By:

Maxim Technologies, Inc.
303 Irene Street
P.O. Box 4699
Helena, Montana 59604

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INTRODUCTION

See Figure 1 (Page 2) For Project Location

The New World Mining District (District) Response and Restoration Project officially began when the USDA Forest Service submitted an implementation plan to the State of Montana on January 22, 1999. Since that time, the Forest Service has engaged in a number of activities including collecting environmental and engineering data to better understand the site, further investigate portions of the District that were not well understood, and design and construct cleanup actions for the highest priority sites in the District. Since a considerable amount of work has been done since the project was initiated by the USDA Forest Service in 1999, this Project Summary document, which was first distributed in the fall of 2000 and updated in the fall of 2001 and again in the summer of 2002, is being updated annually to keep those interested abreast of on-going project activities. Previous Project Summary documents summarized the project's history, mining-related problems, legal considerations, and cleanup process. This Project Summary for 2003 focuses on cleanup activities that are being undertaken for the project.

Glengarry Millsite Mine Building

The District, which includes a mixture of National Forest and private lands, is a historic metals mining area located in the general vicinity of Cooke City, Montana, in the Beartooth Mountains. The historic mining district is centered northeast of Yellowstone National Park, and contains hard rock mining wastes and acid discharges that impact human health and the environment. Human health and environmental issues are related to elevated levels of heavy metals present in mine waste piles, open pits, acidic water discharging from mine openings, and stream sediments. Cleanup work is challenging in this harsh, mountainous environment due to a severe climate, short construction season, and large amount of snowfall that the District receives.

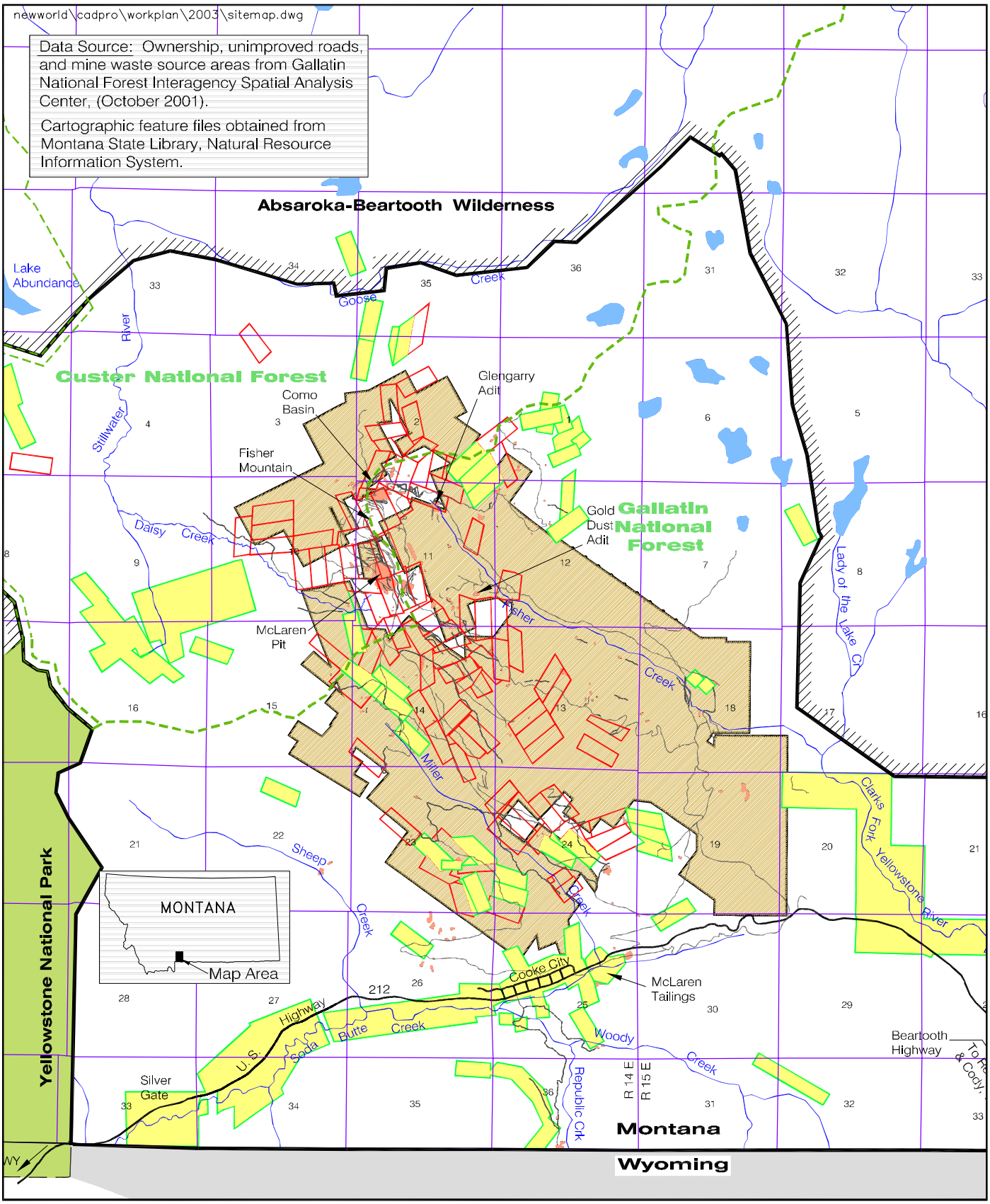
mile District is located at an elevation that ranges from 7,900 feet to over 10,400 feet above sea level, and is snow-covered for much of the year. Historic mining disturbances affect about 65 acres with the largest disturbances attributed to the McLaren Pit (12 acres) and the McLaren Tailings (11 acres). The Glengarry Adit and the nearby Como Basin (5.5 acres) are the other major source areas in the District that contribute pollutants to headwater streams.

The District is situated at the headwaters of three river systems that all eventually flow into the Yellowstone River. These rivers include the Clarks Fork of the Yellowstone, the Stillwater, and the Lamar. The Lamar River flows through Yellowstone Park. The major tributary streams affected by mining disturbances within the District include Daisy, Miller, Fisher, and Soda Butte creeks.

Maps of the project site, previous Project Summaries, and numerous technical documents concerning the site are available at the project website and at information repositories located in Cooke City at the Chamber of Commerce office, in Gardiner at the Forest Service's Gardiner Ranger District office, and in Bozeman at the Gallatin National Forest Supervisor's Office. We encourage you to investigate these information sources to gain a more complete and detailed understanding of the New World Mining District Response and Restoration Project.

Visit our project website for additional project information, project documents, and current activities.

http://ww.fs.fed.us//gallatin



Project Vicinity Map
New World Mining District
Response and Restoration Project
Cooke City Area, Montana
FIGURE 1

CLEANUP APPROACH

The USDA Forest Service is the lead agency responsible for implementing the cleanup of mining related impacts in the District. Other state and federal agencies are cooperating with the effort, including the U.S. Department of Interior (DOI), the Environmental Protection Agency (EPA), and the Montana Department of Environmental Quality (DEQ). Numerous interested parties are also actively involved in following project activities and providing comments to the Forest Service. These groups include the Beartooth Alliance, Greater Yellowstone Coalition, Park County Environmental Council, Northern Plains Resource Council, and numerous other concerned citizens and environmental groups.

The USDA Forest Service uses their Superfund authority granted under the Comprehensive Environmental Response, Compensation, and Liability Act (the Superfund enabling law) to proceed with the cleanup. Following EPA guidance, the Forest Service follows the Non-Time-Critical Removal Action process to implement the cleanup.

The overall goal for cleanup is to improve water quality in the District to the highest quality possible, and reduce or eliminate risks to people and the environment from historic mining impacts. The general strategy the USDA Forest Service is using on this project is to mitigate the readily identifiable solid waste sources as a first phase of cleanup. This is followed by a second phase that addresses problems associated with the more difficult acid mine discharges.

To support activities that occur each year of the project, the USDA Forest Service prepares annual work plans. These plans were prepared in 1999, 2000, 2001, 2002, and 2003. The annual work plans specifically identify the work that is proposed each year. Recognizing that this project also involves restoration, the Forest Service integrates restoration elements within the cleanup process by including restoration in the overall strategy, where possible, for each of the cleanup projects undertaken.

PRIORITIZING AND EVALUATING MINE WASTE SOURCES

One of the key parts of the cleanup evaluation was ranking the mine waste sites in the District using a modified hazard ranking system developed by the Montana DEQ. This system, the Abandoned and Inactive Mine Scoring System, or AIMSS, uses site specific data to evaluate the risk of pollution from mine waste sources via four pathways: groundwater, surface water, direct contact, and air. About 50 site variables, including the results obtained from sampling the waste materials, are input to the scoring system to determine both individual pathway scores and a total score. Higher weights are ascribed to the following: observed releases to groundwater and surface water, especially where an exceedance of a standard is documented; sources that are closer to a population base; and, higher contaminant concentrations, large contaminant quantities, and/or large areas of disturbance. Results of the AIMSS scoring have been presented in numerous project documents including the *Selective Source Response Action Engineering Evaluation/ Cost Analysis*.

Using the goals and objectives outlined in the consent decree, and the results of the AIMSS ranking, higher priority sites are waste sources that are in direct contact with surface water or groundwater, or have discharges that impact water quality or human health. There are a number of District waste sites that fall into this catagory, such as, the McLaren Pit, McLaren Adit, Como Basin, and Glengarry Adit. Waste sources that are relatively benign will be considered, but it is likely that only minor work would be involved with cleanup of the lowest ranked sites, if at all.

Reviewing McLaron Pit Construction Drawings

The Consent Decree and Settlement Agreement require that funds for this project be first expended on cleanup of mining wastes present on "District Property." District Property is defined in the Consent Decree as all property or interests in property that the mining company relinquished to the U.S. Government. The McLaren Pit and Glengarry Adit, for example, are District Property. The McLaren Tailings, on the other hand, are non-District Property. Non-District Property cannot be cleaned up until the Notice of District Property Work Completion (Notice) from the federal government and the State of Montana are received. However, the USDA Forest Service has included non-District Property in the assessment phase of the project. The agency cooperators are involved in obtaining additional funding to cleanup non-District Property wastes.

ENGINEERING DESIGN AND CLEANUP CONSTRUCTION

Due primarily to weather limitations, cleanup construction in the District must be done during the short field season from July to mid-October. The USDA Forest Service has elected to address this factor in the process by breaking the cleanup into smaller projects that can be constructed in one to two seasons. To this end, cleanup actions are evaluated each fall/winter/spring in a Superfund document called an *Engineering Evaluation/Cost Analysis* (EE/CA).

Using the AIMSS list as a starting point, source area characteristics are appraised and cleanup alternatives are developed to mitigate site-specific problems. This is described in an EE/CA, and involves taking a comprehensive look at site characteristics and human health and environmental risks, and then follows an established process of screening relevant response options, developing response alternatives, and evaluating alternatives in detail. The detailed analysis of alternatives weighs the expected results of an alternative against seven criteria including overall protection of human health and the environment, compliance with laws and regulations, long- and short-term effectiveness, implementability, cost, and others. After weighing the pros and cons of a number of alternatives, the Forest Service selects a preferred alternative and issues the EE/CA to the public to solicit comments. Significant comments are addressed in a final EE/CA and a decision document, called an Action Memorandum, is issued. Annual EE/CAs were prepared for the project in 1999, 2000, 2001, 2002, and 2003.

Constructed Runoff Channel above the McLaren Pit

CLEANUP PROGRESS

In March 1999, the Forest Service initiated the planning process for the project. Planning documents were in place in June 1999, and work began with the monitoring of surface water and groundwater quality at selected monitoring points. A list of activities that have been conducted to date is provided below. Some of these more important activities are described in greater detail following the list of activities.

- Prioritized mine waste sources in the District.
- Established a database management system for the project.
- Cataloged existing information available for the site and completed a technical evaluation of existing data.
- Developed a suitable basemap to support engineering design.
- Obtained data to fill identified data gaps for proposed response actions at the site.
- Identified unrecorded cultural features.
- Conducted geochemical sampling of mine wastes throughout the District.
- Improved portions of the Daisy Pass and Lulu Pass roads to accommodate construction traffic.
- Improved a previously constructed surface water

diversion around the Como Shaft.

- Evaluated areas of erosion contributing excessive sediment to area drainages.
- Completed a repository siting evaluation report and collected hydrogeologic data on two prospective repository sites.
- Completed a U.S. Geological Survey led surface water tracer study on Daisy Creek and Miller Creek to determine surface water inputs of metal contaminants.
- Prepared EE/CAs for the following Response Actions: Selective mine waste sources in Fisher Creek; the McLaren Pit; the Como Basin, Glengarry Adit, and remaining sources in Fisher Creek; and, mine waste sources in the Miller Creek drainage.
- Cleaned up selective waste dumps and placed wastes in an engineered repository for the Selective Source Response Action.
- Reopened the Glengarry Adit and Como Raise to more fully characterize underground sources of water within the mine.
- Reopened and investigated water sources discharging from the McLaren Adit.
- Initiated construction of the preferred Response Action for the McLaren Pit.
- Evaluated water quality treatment alternatives for acid mine discharges.
- Investigated soils impacted by metals on National Forest System lands in the vicinity of the Great Republic Smelter.
- Monitored revegetation success at dumps reclaimed in 2001.
- Monitored surface water and groundwater quality several times each year at numerous sites throughout the District.

All the activities listed have been documented in work plans, reports, or technical memorandum and have been issued to DOI, DOQ, EPA, and the public for review and comment.

REPOSITORY STUDY

The identification of central repository site that could be used to isolate mining wastes that could not be reclaimed *in-situ* was determined to be a priority by the project team. The initial (Phase I) repository siting evaluation examined locations able to contain a minimum of 500,00 cubic yards of waste material, or approximately 810,000 tons.

Phase I was conducted in March through July 1999, and used existing technical information available from previous investigations to identify sites with physical and environmental characteristics that would be suitable for disposal of mining wastes. The data evaluated included groundwater, surface water, geology, soil, geotechnical, vegetation, and other environmental information. Phase II was conducted from July 1999 through September 2000, and involved collecting site-specific data at the highest ranked sites determined in the Phase I evaluation.

The SB-4B site, which is located east of the Lulu Pass Road about 0.5 miles north of Highway 212, ranked the highest of the 28 sites evaluated. Evaluation criteria included: location of major faults; geologic setting; steepness of slopes; avalanche potentiall; precipitation and snowfall; and, access using existing roads. One of the key characteristics of the SB-4B site is the presence of glacial till, which is preferred to bedrock or alluvium because of its lower permeability and because it can be salvaged and used in repository construction. The amount of fine-grained material in the till results in relatively low horizontal and vertical hydraulic conductivity, two characteristics important in limiting the movement of leachate that could potentially migrate below a repository facility.

ROAD IMPROVEMENTS

To support cleanup construction, the Forest Service initiated a road improvement project in 1999 to enhance the two major roads in the District. Improvements to the Daisy Pass and Lulu Pass roads primarily involved regrading the road surface, improving drainage, and bringing in gravel surfacing to cover numerous soft spots in the road. In 2000, major road improvements were completed with the construction of two bridges on the Lulu Pass Road. The first bridge replaces the existing low water crossing of Fisher Creek. The second spans Polar Star Creek, a tributary to Fisher Creek just below the Glengarry Dump.

RESPONSE ACTION CLEANUP PROJECTS

A detailed description of Response Actions completed, ongoing, or planned for future years are described below.

SELECTIVE SOURCE RESPONSE ACTION

Using the AIMSS list as a starting point, source area characteristics were appraised and an initial cleanup project was proposed in 1999. The first draft of the Selective Source Response Action EE/CA, which targeted removal of nine waste dumps impacting surface water in the Fisher Creek headwaters, was written, and the preferred alternative (waste removal to the SB-4B repository site) was selected. As a result of public comment, however, the 1999 cleanup work was delayed so that more groundwater quality and flow information could be collected at the repository site.

Following an additional year of collecting data at the SB-4B repository site, the Selective Source Response Action EE/CA was re-released to the public in 2000, and the preferred alternative re-selected. An engineering design package was prepared in the fall of 2000 which detailed reclamation plans for the selected sites, and presented plans and specifications for the construction of a repository with a bottom liner, leachate collection system, and a double-lined capping system.

Excavating Upper Tredennic Waste in 2001

The Selective Source Response Action was initiated in 2001 and was completed in 2002. This initial cleanup project involved removing approximately 32,000 cubic yards of mine waste rock and mill tailings from nine mine waste areas, disposing of these wastes in the SB-4B repository, and revegetating about 4.6 acres of the former waste areas. The waste sites cleaned up represent about 9% of the total acreage of waste on District Property; the volume of waste permanently disposed represents about 8% of the total volume of waste affecting District Property. The repository is designed for expansion, and will be reopened to dispose of additional wastes remaining in the District.

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The major components ofrepository construction involved development of a rock quarry, construction of a 12,000 cubic meter rock toe buttress, installation of a one hectare bottom liner system with toe drains and sump, and installation of temporary and permanent cover systems. Due to difficulties involved with construction and the short

construction season, beginning in April 2002 with the final pumping done in October 2002. While a portion of the water pumped from the repository was made into snow and disposed at the site in April 2002 (about 11,000 gallons), the majority of the water (about 42,300 gallons) was disposed at the Cody, Wyoming, sewage treatment lagoon. By mid-June 2003, an additional 30,000 gallons had accumulated in the sump over the winter. Drainage estimates for water remaining in the waste indicate that over 60,000 gallons (and possibly as much as 450,000 gallons) of additional water could be expected to accumulate in the repository sump in the future. The sump will continue to be monitored and emptied as drainage accumulates.

Water quality improvements in tributaries draining the former waste areas are expected from this action, although improvements are likely to be gradual from this action alone, and later augmented by additional work that is planned for the Fisher Creek drainage. Water quality will continue to be monitored at select stations downstream of the reclaimed sites to document changes in water quality.

MCLAREN PIT RESPONSE ACTION

Planning and preparation for the McLaren Pit Response Action began in 1999. A considerable amount of environmental and engineering data was needed, and the 2000 field season was the time when most of these data were collected. The USGS, working under a contractual arrangement with the Forest Service, conducted an ionic tracer study of metals loading in Daisy Creek in 2000, and the Forest

Construction runoff channel below McLaren Pit

Regrading McLaren Pit Waste Rock

Service's primary contractor, Maxim Technologies, Inc., collected data in the McLaren Pit that would support the preparation of an EE/CA. Hydrologic and metals loading models were completed with these data, indicating that the McLaren Pit contributed from 20% to 50% of the metals load in Daisy Creek. With the results of these studies substantially complete in the fall of 2000, a draft of the McLaren Pit Response Action EE/CA was prepared and released to the public in May 2001.

The preferred alternative for the McLaren Pit Response Action is consolidation of waste rock from dumps in the Daisy Creek headwaters into the McLaren Pit, and capping of the consolidated wastes with an impermeable cap. The scope of the McLaren Pit Response Action is limited to reducing or eliminating uncontrolled releases of metals from mine waste material in the Daisy Creek headwaters. By addressing releases from mine wastes in the McLaren Pit and nearby mine dumps, some reduction in contaminant concentrations are expected in surface water, groundwater, and new stream sediment accumulation as a result of removing or controlling these primary sources of mining-related metals in Daisy Creek.

The waste dumps slated for consolidation into the pit are the McLaren Pit spoils (wastes located below the county road and west of the pit) and the multicolor dump. The dumps are all located within the Custer National Forest. Approximately 24,000 cubic yards of waste rock are contained in the dumps, which cover about 3.5 acres of disturbance. The scope of this response action does not include directly addressing contaminated groundwater, the McLaren Mine adit discharge, or other sources of potential contamination in the headwaters of Daisy Creek. More comprehensive analysis of response technologies applicable to the McLaren Mine adit

discharge will be completed on a District-wide basis in 2004.

An engineering design and construction package for the McLaren Pit Response Action was completed in March 2002. The design involves capping about 11 acres of the pit with a geomembrane liner, covering the liner with a drainage layer and soil, and constructing runon and runoff channels to convey water off of the capped

Erosion channel below the Como Basin

wastes. The USDA Forest Service selected a contractor in May 2002, and project construction was initiated in July 2002. Work in 2002 involved consolidation of waste rock from the edges of the pit, regrading of the waste to prepare for construction of the multi-layered cover, and construction of runoff and runon ditches and channels. In 2003, the multi-layered cover will be constructed, with work expected to be completed in early October.

COMO BASIN/GLENGARRY ADIT/FISHER CREEK RESPONSE ACTION

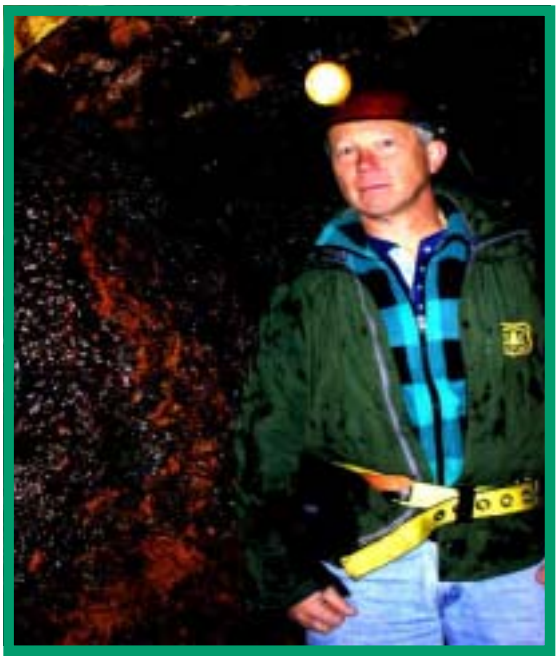
The Glengarry Mine has been targeted for rehabilitation since the inception of the Response and Restoration Project because it is one of the principal sources of metals loading in the headwaters of Fisher Creek. The mine discharges 23 to 57 gallons per minute (gpm) of low pH, iron-, zinc-, and copper-bearing water directly into Fisher Creek.

The Glengarry Mine consists of 3,060 feet of drifting and two nearly vertical raises. One of the raises extends 425 feet upward and surfaces in the Como Basin at the foot of the north flank of Fisher Mountain.

The top of this raise passes through the Meagher Limestone formation, and a massive sulfide ore deposit hosted in the Meagher.

Pony Mining Contractors, under contract to the USDA Forest Service, reopened the Glengarry Tunnel for assessment in September and October 2000. During this phase of reopening and assessment, accumulated debris and ferricrete mud two to five feet deep were removed from the tunnel beginning at the portal and extending back to a "Y" intersection 1,540 feet in from the portal. The two branches of the "Y" were made accessible, but debris and ferricrete were not removed. The Glengarry Tunnel was surveyed and a planimetric map produced.

The following year, in June 2001, the second raise from the surface in the Como Basin was reopened and repaired down to a point well below the base of



Iron deposits in the Glengary Mine

the Meagher Limestone. Three separate short horizontal workings were encountered in the Meagher Limestone at 35, 75, and 100 feet below the surface. Each horizontal level and the raise down to 215 feet were surveyed and the geology was mapped. Water inflows were measured and sampled at the collar of the raise and at each horizontal level during July and August 2001. Water was also sampled at the contact of overburden with bedrock (Park Shale) in the exposed wall of the excavation during re-construction of the raise collar.

Later in 2001, debris was removed and temporary ladders were installed in the first raise beyond the "Y" intersection in the Glengarry workings. The purpose of this work was to determine whether the top of the raise was open or if it extended beyond the 50 feet shown on the 1930's map. A timber A total of five sampling events have been completed in the Glengarry underground that were timed to catch key points of peak and low flow in the hydrograph year. Total flow from the adit ranged from less than 10 gpm to 50 gpm. Water flowing into the Glengarry Mine comes from essentially three point sources and one diffuse source. The point sources are the Como raise, the first raise, and a roof leak at 1,050 feet in from the portal of the adit. Diffuse roof leaks were observed primarily in the first 1,200 feet in porphyritic rock.

Load analysis shows that the vast majority of loading into the adit comes from the raises and the 1050 roof leak, and not the diffuse roof leaks. Comparison of loading sources between elements shows that the Glengarry Tunnel receives several orders of magnitude more copper from the top of the Como raise than from all the other in-flow sources combined. The raises also contribute more discharge from the Como raises and the 1050 fracture are most important in reducing contaminant loading from the Glengarry Adit to Fisher Creek.

A Draft EE/CA was released to the public in June 2002 that evaluates response action alternatives to address mining impacts from the Glengarry Adit, the Como Basin, and remaining mine waste dumps in the Fisher Creek drainage. The EE/CA is structured around each of these three source areas. Response Action alternatives were developed for each of the three source areas to specifically address human health and environmental problems.

Response Action alternatives for the Glengarry Adit include several different options that specifically address each of the four major sources of water in the underground workings. The preferred alternative for this source area involves grouting and backfilling the Como raise, grouting the 1050 roof leak, and partially backfilling the drift. For the Como Basin, alternatives were developed that are similar to those described for the McLaren Pit Response Action EE/CA. These alternatives include total removal of waste to an on-site repository, in-situ treatment, and capping. The preferred alternative for the Como Basin is capping unconsolidated and disturbed materials in the basin with a geomembrane liner. For the mine dumps in upper Fisher Creek, run-on and runoff controls, in-situ treatment, and total removal were considered. The preferred alternative for this source area is removing the two largest waste rock dumps (the Glengarry and Gold Dust) to the SB-4B repository, and implementing run-on and runoff controls at the remaining dumps that pose potential sediment and erosion issues.

Construction cleanup work for the Glengarry/Como Basin/Fisher Creek source areas will begin in 2003 and will likely take two to three years to complete.

Construction cleanup work for the Glengarry/ Como Basin/Fisher Creek source areas will begin in 2003 and will likely take two to three years to complete. The Response Action has been split into three different projects with the first project involving closure of the Glengarry Adit. A contractor for the closure of the Glengarry Adit was selected in April 2003, and work is expected to start in early July. Closure of the Glengarry Adit is slated to be completed over a two-year time frame. The second project, implementing runon and runoff controls at selected dumps in Fisher Creek will likely be completed in 2004. Construction of the cap in the Como Basin, removing the Glengarry and Gold Dust dumps, and expansion of the repository will occur in 2005.

MILLER CREEK RESPONSE ACTION

An EE/CA for sources located on District Property in the Miller Creek was completed in 2003 and released to the public for comment in June. This considered in the Miller Creek EE/CA is the replacement of damaged wetlands in front of the portal of the Glengarry Adit in Fisher Creek. These two items, along with cleanup of mining-related solid waste at the Cumberland Barrel Dump in Miller Creek, are considered ancillary actions to the preferred Miller Creek Response Action alternative.

The preferred alternative for the Miller Creek response action is removal of two of the larger dumps in the drainage to the SB-4B repository, and implementing surface water controls at several other dumps. The remaining mine waste dumps in the Miller Creek drainage appear to contribute little in the way of impacts to water quality. The dumps planned for removal are the Black Warrior and Little Daisy.

The Black Warrior dump is the only human health risk identified in the Miller Creek drainage. It contains about 22% of the total mine waste on District Property in the drainage. 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 but the water does not obviously come to surface further downslope. Impacts to surface water from the Little Daisy Mine outflow and waste rock appear to be only minor. This dump is comparable in size to the Black Warrior, containing about 24% of the total waste on District Property in Miller Creek. Removing these two dumps to the repository eliminates 46% of the total volume of waste rock present in Miller Creek.

Elsewhere, environmental risks appear to be associated with mine waste that is in contact with surface water and/or groundwater. This is the case at the Miller Creek Dumps One and Two, which are two dumps located proximal to Miller Creek. Only two other very small dumps sites occur in close proximity to Miller Creek. Other mine waste dumps

Black Warrior Mine

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).

NATURAL RESOURCES RESTORATION

In addition to alternatives related to mine waste dumps in the Miller Creek drainage, the Miller Creek EE/CA examined restoration actions to respond to impacts to natural resources that are related to sediment contamination derived from roadways throughout the District. Areas of known and potential acid production and other areas of anomalous metal concentrations in soil and bedrock represent significant sources of contamination, which are exacerbated by surface disturbances such as roads that expose these materials to ongoing erosion both on roadbeds and cut and fill slopes. Many of these roads were historically developed to access the numerous mines and prospects in the District. Sediments derived from roads impact surface water quality as well as aquatic habitat, and reducing sediment derived from roads will improve water quality. Another natural resource restoration issue considered in the Miller Creek EE/CA is the replacement of damaged wetlands in front of the portal of the Glengarry Adit in Fisher Creek. These two items, along with cleanup of mining-related solid waste at the Cumberland Barrel Dump in Miller Creek, are considered ancillary actions to the preferred Miller Creek Response Action alternative.

ADIT DISCHARGE RESPONSE ACTION

Response actions associated with adit discharges in the District will be evaluated in a separate EE/CA in 2004. There are 25 discharging adits in the District (including the Glengarry), and the likely response actions that would treat or eliminate these discharges are similar. The EE/CA will address risks to water quality from these discharges (except for the Glengarry discharge, which is being mitigated under a separate cleanup action as described above), and will analyze potential treatment scenarios and resulting load reductions that might be realized. The result of the EE/CA will be a preferred alternative(s) to address impacts from these discharges to water quality.

The Forest Service took an initial look at feasible water quality treatment alternatives, and has identified one potential passive treatment approach that may be applicable to these mine discharge sources. This approach involves building a treatment cell filled with organic and nutrient substrates, burying the cell to eliminate oxygen, and routing mine drainage through the buried cell.

MCLAREN MILLSITE AND REPUBLIC SMELTER

These two sites are on non-District Property located adjacent to Soda Butte Creek near Cooke City. The sites are located on National Forest System (NFS) and private land and contain waste rock, concentrate, smelter waste, and metals contaminated soil that could potentially impact human health and the environment. The USDA Forest Service and the Montana DEQ conducted previous investigations at the sites in 1999, 2000, and 2002. At the McLaren Millsite, laboratory analysis of soil samples collected from mine waste show arsenic levels ranging between 8 and 46 milligrams per kilogram (mg/kg), copper between 170 and 5,770 mg/kg, and lead between 74 and 269 mg/kg. Soil pH was extremely acidic, ranging between 1.9 and 3.0 standard units. Analytical results for native soil underlying mine waste indicate that native soil has much lower concentrations of arsenic, lead, and copper. The estimated volume of mine waste on NFS lands at this millsite is about 8,520 cubic yards.

Compacting wast in the Repository

Investigations of the Great Republic Smelter site by the USDA Forest Service and the Montana DEQ indicate that about 200 cubic yards of the total 3,250 cubic yards of waste present at the site lies on NFS lands. In addition, investigation by the USDA Forest Service of metal contaminants in soil surrounding the smelter site identified four areas in the vicinity of the smelter that contained concentrations of lead in soil exceeding the project human health guideline for recreational use (1,100 mg/kg).

The USDA Forest Service will be conducting additional work at these sites using funding and resources separate from the response and restoration project. This is being done separately because the consent Decree and Settlement Agreement require receipt of a Notice of District Property. Work Completion. However, because removal of the wastes is a potential alternative that needs to be evaluated, and because the SB-4B repository (the likely place for waste disposal) will likely only be available for disposal of waste in 2005, (prior to the issuance of a Notice), the development of alternatives and selection of a preferred alternative needs to be completed ahead of this time. Therefore, the USDA Forest Service is proposing that an EE/CA be prepared for NFS land at the two sites, and engineering designs be prepared for a preferred reclamation alternative at each site. Because the USDA Forest Service has no regulatory authority to address the waste on private land, the Montana DEQ has developed separate EE/CAs for each site that addresses mine waste on private land.

CLEANUP ACTIVITIES PLANNED FOR 2003

The following work activities are planned for the 2003 field and construction season:

- Maintain community relations.
- Maintain project database and Website.
- Prepare an update to the Support Document and Implementation Plan for the temporary water quality standards that were issued to the United States by the Montana DEQ.
- Continue long-term monitoring of surface water and groundwater.
- Monitor water quality at supplemental surface water and adit locations.
- Monitor water quality in stream reaches below the McLaren Pit and Glengarry Adit construction areas.
- Monitor reclamation success at sites reclaimed in 2001.
- Complete the McLaren Pit groundwater investigation that was initiated in 2001.
- Complete construction of the McLaren Pit Response Action.
- Initiate construction for the Glengarry Adit Response Action
- Complete a follow up investigation of soils impacted by metals on NFS lands in the vicinity of the Great Republic Smelter.
- Prepare Response Action construction packages for the preferred clean up alternatives for the Como Basin, remaining work in the Fisher Creek drainage, closure of the McLaren Adit, and any work identified for mining-related impacts in Miller Creek.
- Coordinate with the Gallatin and Custer National Forests on an analysis of roads in the District.
- Prepare 2004/2005 Work Plan.

REVISED CLEANUP SCHEDULE

Table 1 shows a revised schedule for remaining years of the project. The first year shown, 2001, is the first year of actual cleanup work. Work completed in 1999 and 2000 focused on assessment of environmental impacts, road improvements, and planning and preparation for cleanup. As shown in the table, project work on District Property is expected to be completed by 2006 with monitoring continuing in 2007. Remaining work on Non-District Property is contingent on receipt of a Notice of District Property Work Completion from the United States and the State of Montana, as well as availability of funding for cleanup.

Gold DustAdit

The schedule presented in Table 1 may require modification as the project proceeds, as the schedule may be affected by a variety of factors including, but not limited to, weather conditions, availability of materials, equipment, and/or supplies, contract administration delays, or contract appeals. A delay on one project in one year may also lead to delays in other projects shown in Table 1, as most of the cleanup activities planned for future years are either contingent upon the completion of other cleanup activities or have to be done in conjunction with other cleanup activities.

PROJECT CLOSURE

Long-term monitoring plans were developed to evaluate the beneficial effects of cleanup on surface water quality and effectiveness of revegetation establishment. With these monitoring plans in place, the USDA Forest Service can evaluate the results of the yearly cleanup projects in terms of both water quality and erosion, and then assess what additional actions will be necessary as the project proceeds. Once District Property wastes are cleaned up to the extent practicable, and a Notice of District Property Work Completion is received, remaining funds can be spent on non-District Property wastes.

Height of Mud in the Glengarry

Entering the Glengarry Adit

Settlement Pond at the Glengarry Mine

Mucking Out the Glengarry Adit

TABLE 1
REVISED CLEANUP SCHEDULE
New World Mining District Response and Restoration Project

YEAR	PROJECT	NOTES
2001	Selective Source Response Action	Removal of waste from eight sites
2002	McLaren initial year	Construction of waste rock consolidation and drainage controls
	Monitoring and Maintenance	Surface water, groundwater, revegetation; Selective Source Repository sump repair
2003	McLaren second year	Complete waste regrading; construct cover system
	Glengarry Adit initial year	Grout Como Raise; prepare Glengarry tunnel for grouting and backfilling
	Monitoring and Maintenance	Surface water, groundwater, revegetation; as necessary maintenance
2004	Glengarry Adit second year	Backfill Glengarry Tunnel; install cemented fill
	Fisher Creek Source Controls	Regrade and revegetate waste rock dumps at eight sites
	Miller Creek Source Controls	Decision to be made in Summer 2003
	Monitoring and Maintenance	Surface water, groundwater, revegetation; as necessary maintenance
2005 known projects	Como Basin Cap and Cover	Cap and cover disturbed and metals-enriched soil materials in-situ
	Fisher Creek Dump Removals	Glengarry and Gold Dust dumps
	Lulu Pass Road Reclamation	To be done in conjunction with Como Basin Response Action
	Selective Source Repository Expansion and Final Closure	Glengarry and Gold Dust dumps
	Monitoring and Maintenance	Surface water, groundwater, revegetation; as necessary maintenance
2005 potential projects	Miller Creek Dump Removals	Decision to be made in Summer 2003
	Restoration, Road Work in Miller Creek	Decision to be made in Summer 2003
	McLaren Mill Site Removal	National Forest System Land only (cleanup funds outside Consent Decree)
	Republic Smelter Removal	National Forest System Land only (cleanup funds outside Consent Decree)
2006	Adit Discharge Response Action	Evaluation of cleanup alternatives for 25 remaining discharging adits in the District
	District-Wide Monitoring and Maintenance	Surface water, groundwater, revegetation; as necessary maintenance
2007	District-Wide Monitoring and Maintenance	Surface water, groundwater, revegetation; as necessary maintenance
Contingent - Completion of District Property	Remaining Non-District Property	Response Actions following Certificate of Completion